



Clare County Development Plan 2023–2029

Volume 6 Clare Wind Energy Strategy

Interim Version

April 2023



COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL





Contents

Preface	4	5 Glossary	39
1 Introduction	7	6 Annex A: Best Practice and General Considerations for wind energy developments in County Clare	43
1.1 Background to Renewable Energy	9	6.1 General Considerations for Applications for Wind Energy Development	44
1.2 Evolution of Wind Energy Strategy and Development in County Clare	10	6.2 Biodiversity, Flora and Fauna	45
1.3 Policy Context.....	12	6.3 Water	46
1.4 Terms and Definitions.....	16	6.4 Soil and Geology	47
2 Methodology	17	6.5 Landscape	47
2.1 Introduction.....	18	6.6 Cultural Heritage	48
2.2 Methodology	20	6.7 Population and Human Health	48
2.3 Geographical Information System (GIS)	20	6.8 Air and Climate.....	48
2.4 Fieldwork.....	22	6.9 Material assets – transport, waste management, energy use and noise ..	49
2.5 Consultation	24	6.10 Aviation Safety and Navigation	49
2.6 How the SEA and HDA informed the Wind Energy Strategy.....	24	6.11 Cumulative Impacts of Wind farms	49
3 Wind Energy Objectives	27	6.12 Strategic Environmental Assessment Monitoring Programme for the implementation of the Wind Energy Strategy	49
3.1 Introduction.....	28	6.13 Land use in ‘Strategic’ and ‘Acceptable in Principle Areas’	50
3.2 General Objectives for Wind Energy Developments	28	7 Annex B: LCA Forms	51
3.3 Specific Area Objectives	30		
3.4 Planning Exemptions for Wind Development	30		
4 Advice on Landscape Capacity for wind energy developments based on Landscape Character Areas (LCA’s)	31		
4.1 Introduction.....	32		

Preface

The Clare Wind Energy Strategy forms part of the Clare County Development Plan 2023-2029. In accordance with the requirements of the Department of Environment, Community and Local Government as set out in Circular PL20-13, the previous “Clare Wind Energy Strategy 2017-2023” has not been reviewed as part of the preparation of this draft plan.

Circular PL20-13, dated 20th December 2013, states that in the cyclical review of a Development Plan it is advised that, until the national policy review processes have concluded in relation to the Wind Energy Development Guidelines and the Renewable energy Export Policy and Development Framework, local authorities should defer amending their existing Development Plan policies and should instead operate their existing Development Plan policies and objectives until the completion of these processes and further advice is issued.

The local authority has had regard to all the submissions received during the consultation stages of the Development Plan. However, any issues raised with regard to wind energy policy were addressed in the context of the requirement to comply with Circular PL20-13.

Planning Circular Letter, Circular PL 20-13 20 December 2013

To: Each County/City Manager,
Each Director of Planning,
Each Town Clerk of Planning Authorities,
An Bord Pleanála.

Review of Wind Energy and Renewable Energy Policies in Development Plans

This circular letter concerns the preparation or review of renewable and/ or wind energy strategies, whether as part of the preparation of a new Development Plan or a variation of an existing plan.

As you are aware, there are a number of policy initiatives presently under review and development in relation to renewable energy generally and wind energy, specifically:

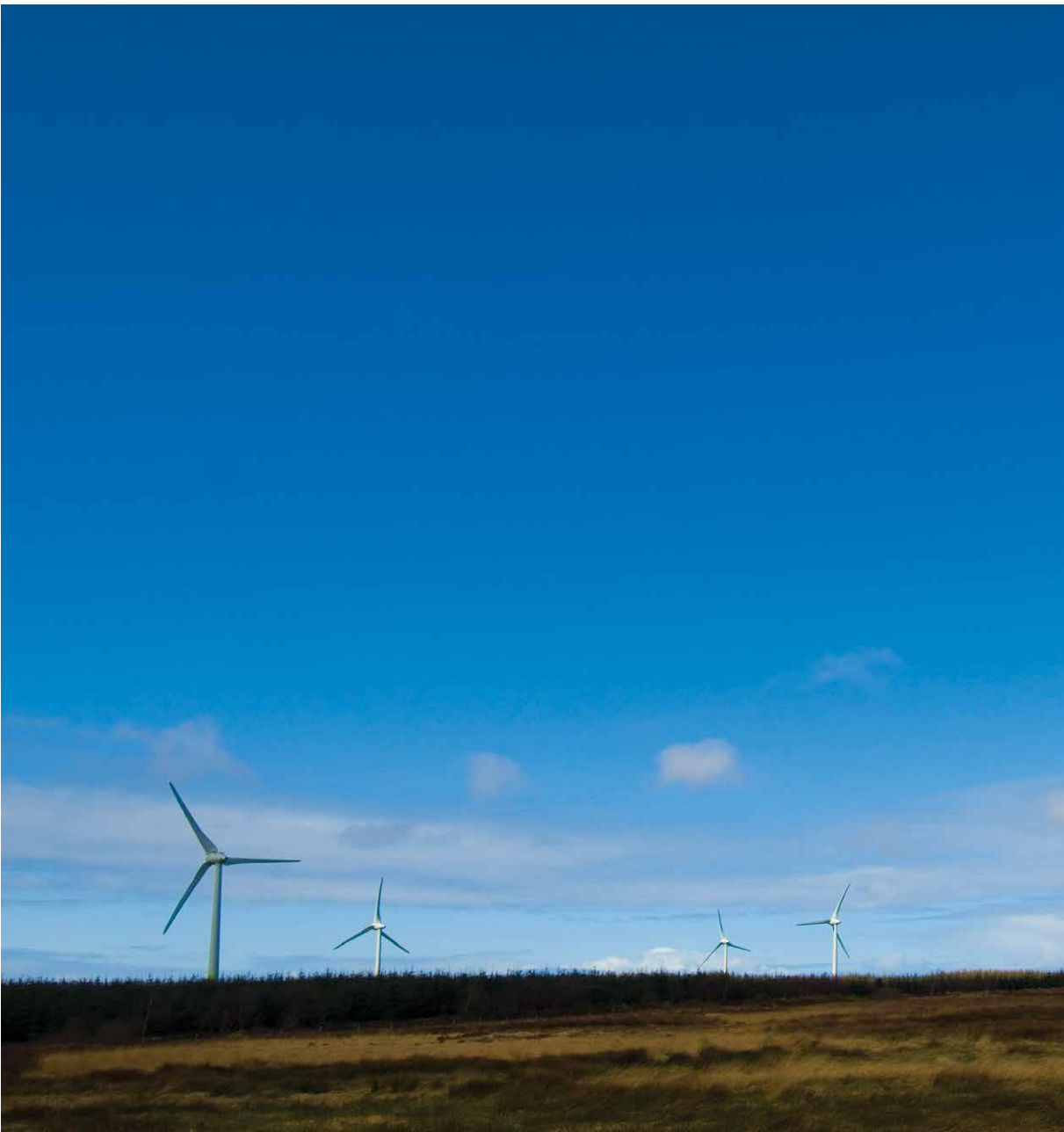
- i Focussed review of the Wind Energy Development Guidelines As recently indicated in Circular PL 19-13 of 11 December 2013, this Department has recently commenced public consultation on draft revised Wind Energy Development Guidelines focussing on the issues of noise (including distance from dwellings) and shadow flicker. The closing date for receipt of comments is 21 February 2014, following which revisions to the existing 2006 Guidelines will be finalised and issued to planning authorities under Section 28 of the Planning and Development Act 2000 (as amended); and
- ii Renewable Energy Export Policy and Development Framework The Department of Communications, Energy and Natural Resources (DCENR) has just completed the first stage of public consultation on a proposed Renewable Energy Export Policy and Development Framework for the purposes of examining the potential for export of renewable energy, including wind energy, initially to the UK.

This framework will be informed inter alia by the carrying out of assessments under the SEA (Strategic Environmental Assessment) and Habitats Directives. DCENR will shortly commence preparation of the scoping report for the SEA which will be published in Quarter 1 2014 and will then begin the Stage 2 consultation period.

As the preparation or variation of local authority Development Plans must take account of all relevant and up to date national policy, it is therefore advised that until both of the above national policy review processes have concluded, local authorities should defer amending their existing Development Plan policies as part of either the cyclical review or variation processes. They should instead operate their existing Development Plan policies and objectives until the completion of these processes and advised otherwise by this Department.



Terry Sheridan,
Principal Officer,
Planning Section.



1

Introduction



This Wind Energy Strategy forms part of the Clare County Development Plan 2011 – 2017. The Wind Energy Strategy was prepared to reflect the changing economic environment and to respond to anticipated commercial demands for wind energy developments. The Wind Energy Strategy will facilitate development of wind farms by maximising the wind resource of the County having regard to recent technological advances in turbine design, updated information on wind speeds, proximity and availability to grid connections and to changing energy and grid connection regulations, while minimising any environmental and visual impacts.

A key priority, given the wind resource in County Clare, is to identify sites of strategic regional and national importance that have the potential to accommodate wind energy development. The Wind Energy Strategy was adopted as Volume 5 of the Clare County Development Plan 2011-2017. The strategy should be read in conjunction with policies and objectives contained in Volume I of the Clare County Development Plan 2011 – 2017.

The 2005 Clare Wind Strategy utilised the County Landscape Character Assessment as a means of identifying appropriate areas for wind farm development. Therefore, the key considerations were the landscape and visual impacts of wind farm development. In line with national guidance¹ at the time, areas of the County were designated as Preferred, Open for Consideration and No-go.

In preparing the current strategy, landscape and visual considerations are only one of a number of issues covered. A balance is now sought between achieving greater energy security, as identified in the Limerick Clare Energy Balance 2006 and Limerick Clare Climate Change Strategy 2006, achieving commitments at national and international level regarding reductions in greenhouse gases, promoting renewable energy and other environmental considerations. The Wind Energy Strategy will guide development of wind farms within the County up to 2017.

¹ *Wind Farm Development- Guidance for Planning Authorities Department of Environment, Heritage and Local Government 1996*

This Wind Energy Strategy builds upon its predecessor, taking account of updated National and Regional Planning Guidelines, Strategies and Policy Documents. It is also informed by issues of particular national and global environmental importance that have evolved, and are now accepted as being critical to the formulation and implementation of sustainable development, such as climate change, renewable and alternative energy. This Wind Energy Strategy designates areas as being a) 'Strategic' b) 'Acceptable in Principle' c) 'Open for consideration' and d) 'Not Normally Permissible'. The total land area proposed as Strategic is 9,112 hectares, and the area proposed as 'Acceptable in Principle' is 47,320 hectares. This represents 2.6% and 13.8 % of the County or 16.4% of the total land² area.

The objectives of the Strategy are as follows:

- To reflect and plan for technological advances in wind farms over the next number of years.
- To develop a Wind Energy Strategy having regard to the *Wind Energy Development Guidelines, Guidelines for Planning Authorities* (DoEHLG, 2006) (the Planning Guidelines issued by the Department of Environment, Heritage, and Local Government).
- To more closely align the County's wind generation policy to the existing wind energy resources.
- To support a planned approach to wind energy development in County Clare predicated on the optimal harnessing of the County's wind energy resource, and at a minimum, requiring that 40% of the County's electricity needs can be met from wind farms.
- To identify strategic areas for wind energy development of Regional and National importance.
- To recommend that a working target of 550 MW of wind energy is harnessed in County Clare, to enable the County to make the initial steps toward a low carbon economy by 2020.

² *Calculations based on total land area of 318,784 hectares*

- To support County Clare in reducing the CO₂ emissions associated with energy production, as identified in the Limerick Clare Climate Change Strategy (Limerick Clare Energy Agency 2006) and subsequent Mid West Regional Climate Change Strategy (2008).
- To promote economic development through wind energy and other renewables in the County, underpinning the need for energy security, the promotion and establishment of a low carbon economy and the development of green business within the County.
- To ensure full compliance with the requirements of Directive 2001/42/EC and Statutory Instrument 436 /2004 on the assessment of the effects of certain plans and programmes on the Environment, the SEA Directive, and the associated Planning and Development (Strategic Environmental Assessment) Regulations 2004.
- To ensure full compliance with the requirements of the Habitats Directive Assessment in line with Statutory Instrument 94/1997.
- To ensure the production of wind energy is consistent with and takes account of nature conservation and environmental legislation and targets, including the conservation and protection of the Designated Natura 2000 sites in the County.

In tandem with the above objectives, the development of the Wind Energy Strategy and its incorporation into the Clare County Development Plan 2011 – 2017 has been informed by the Strategic Environmental Assessment (SEA) and Habitats Directive Assessment (HDA) processes in line with Statutory Instrument 436 /2004 and 94/1997 respectively. The Environmental Report and Habitats Directive Assessment were prepared in tandem with, and informed this Strategy.

A short environmental profile of the lands proposed as strategic and acceptable in principle is provided in Annex A. General Considerations and further detail on the environmental resources of these areas can be found in the accompanying SEA and HDA Reports.

1.1 Background to Renewable Energy

Renewable energy is increasingly seen as a means to address climate change challenges, reduce carbon dioxide emissions and increase national fuel security. Renewable energy can be defined as energy developed from sources that are constantly replenished through the cycles of nature and, unlike fossil fuels, are not finite. The main renewable energy sources are:

- Wind
- Sun (solar energy)
- Moving water (hydropower, wave and tidal energy)
- Heat below the surface of the earth (geothermal energy)
- Biomass (wood, waste, energy crops)³

A transfer from a fossil fuel to renewable energy generation economy would mean:

- Reduced CO₂ emissions
- Secure and stable energy supply for the long term
- Reduced reliance on expensive fuel imports
- Investment and employment in indigenous renewable energy projects, often in rural and underdeveloped areas⁴.

The national target for renewable energy was increased in October 2008, to reach 40% of electricity generated by 2020. This national target is estimated to require an installed capacity in Ireland of around 6000MW by 2020.

This Wind Energy Strategy concentrates on on-shore wind energy developments within the functional area of Clare County Council. However, as other renewable technologies develop and become established, these will be recognised and may be reconsidered over the intended lifetime of the Strategy. Furthermore the Council will have regard to the Sustainable Energy Authority of Ireland's 'Offshore Renewable Energy Action Plan' upon publication

³ Source: Sustainable Energy Authority of Ireland. http://www.seai.ie/Renewables/Renewable_Energy_FAQ/

⁴ Source: Sustainable Energy Authority of Ireland

1.2 Evolution of Wind Energy Strategy and Development in County Clare

The Clare County Development Plan 2005-2011 took into account the *Strategy for Intensifying Wind Energy Deployment, Renewable Energy Group*, (Government of Ireland, 2000), the *Landscape Character Assessment of County Clare* (ERM, 2004) and the Wind Farms in County Clare Report *Landscape Character Assessment of Wind Farms in County Clare* (Rural Resource Development, 2003) and provided supporting objectives to facilitate wind energy development in the County such as the following.

It is the policy of the Planning Authority to seek the development of wind energy infrastructure sufficient for the production of 50MW of electricity by the year 2010 through the identification of suitable areas.

The 50MW target set in the 2005 Clare County Development Plan for 2010 has already been exceeded, with an existing permitted capacity of approximately 101.4MW granted permission.

Currently there are two wind farms operating in County Clare generating approximately 32MW. This compares with 212MW generated in County Donegal, which has the largest number of wind farms nationally. Since 2000, there have been a total of 22 wind farm applications; Table 1a below shows the breakdown of these applications and Figure A shows the approximate location of the applications granted planning permission.

Table 1a:
Planning Applications associated with Wind Energy Developments 1995 to 2011.

Planning Applications for Wind farms	Numbers
Not decided or further information requested	4
Granted	25*
Refused	16
Total	45

* This figure includes 6 no. applications for single domestic wind turbines.

In addition to planning applications, developers of wind energy projects are required to apply through the Commission for Energy Regulation (CER) to connect into the national grid. This is currently undertaken on a first come first served basis and planning permission is not required to apply for a connection.

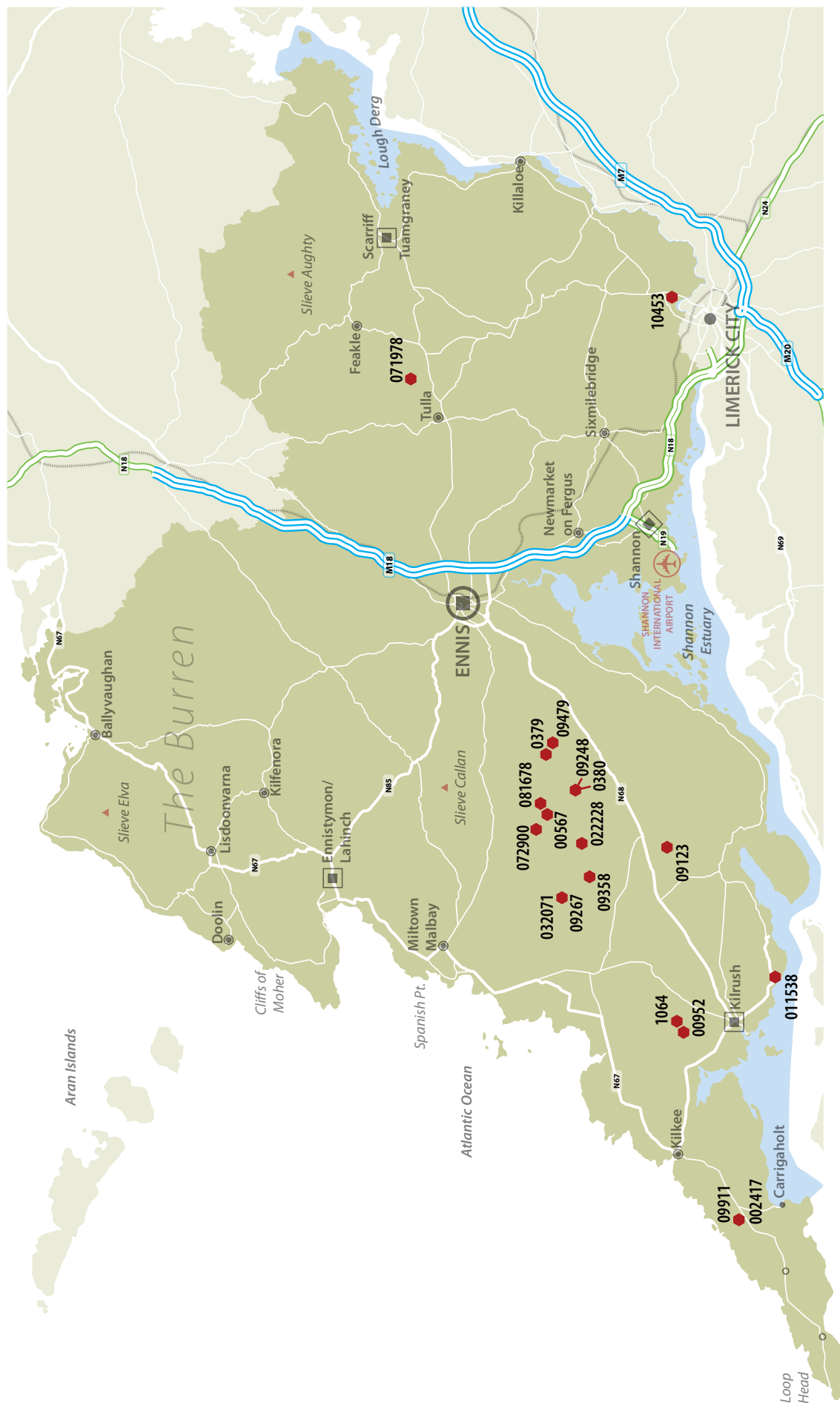
Table 1b lists the node assignments in the current round of applications called Gate 3(c1), as of 30th April 2010. Should all these applicants receive planning permission; an additional 109.779 MW of renewable energy capacity will be installed in the County. However under the White Paper on Energy, 2007, Ireland must produce 40% of its electricity from renewables by 2020. For County Clare the installed capacity to achieve this level of renewables would be approximately 250 MW⁵, more than double that presently approved for planning.

Table 1b:
Gate 3 Node Assignments as of April 2010.

Project Name	Generation mw	Connection
Cahermurphy	6	Booltiagh 110kv station
Kiltumper	5	Booltiagh 110kv station
Boolynagleragh (1)	36.98	Booltiagh 110kv station
Boolynagleragh (2)	11.64	Booltiagh 110kv station
Glenmore	30	Booltiagh 110kv station
Lissycasey	6	Booltiagh 110kv station
Garvohill	6	Ennis 110kv
Toonagh	0.9	Ennis 110kv
Toonagh	0.499	Ennis 110kv
Tullabrack	13.8	Tullabrack 110 kv
Carrownawelaun	4.6	Tullabrack 110 kv
If all developed, total capacity	121.419 mw	(c1)

5 Source: Limerick Clare Energy Agency

Figure A:
Distribution of Significant Wind Energy Developments
Granted Planning Permission in County Clare



◆ Location of Permitted Wind Energy Developments >500kW

1.3 Policy Context

This Wind Energy Strategy has been developed with regard to:-

- Energy security and renewable energy requirements as identified in local & national legislation & policies, outlined in Table 1c below.
- Climate Change Strategies obligations as identified in Local & National legislation & policies, outlined in Table 1c below.
- Preparation of the Clare County Development Plan 2011 – 2017.

A short synopsis of relevant policy and legislation is provided in the following Table 1c.

**Table 1c:
Relevant Policy and Legislative Framework**

Policy and Legislation	Explanation	Planning Implications
Kyoto Protocol- 2012.	European Union agreed to an overall reduction target of 8% below 1990 levels of total greenhouse gas emissions. Irelands target is to limit the increase of GHG to 13% over the 1990 levels by 2008.	Have regard to Kyoto Protocol
National Climate Change Strategy 2007-2012 (DoEHLG, 2007)	The Strategy shows the measures by which Ireland will meet its 2008 -2012 commitments and how those measures will position the country post 2012. In addition, it identifies the areas in which further measures are being researched and developed to meet the 2020 commitments.	Have regard to the National Climate Change Strategy 2007-2012 (DoEHLG, 2007)
EU Directive 2001/77/ EC	This Directive relates to the promotion of electricity produced from renewable energy sources in the internal electricity market. It required Ireland to generate 13.2% of its electricity from renewables by 2010. Target subsequently increased see below.	This 2001 Directive will be replaced by a new Directive to be agreed in late 2009. The key difference will be the setting of legally binding renewable energy targets rather than the existing indicative ones. The new Directive must be transposed into national legislation by 31st March 2010. Ireland may be subject to sanctions if the renewable energy targets are not met.
Delivering a Sustainable Energy Solution for Ireland. White paper on Energy, 2007	This paper sets out the Government's Energy Policy Framework from 2007 to 2020. Target increased to 15% by 2010 and 33% by 2020. Later in 2008, this 2020 target was increased again to 40% for all Ireland target.	This can inform the establishment of targets for County Clare
Planning and Development (Strategic Infrastructure) Act 2006.	Facilitates a streamlining of the planning process for types of defined projects including transmission lines, inter-connectors and wind farm developments with more than 50 turbines or having a greater output of 100 MW.	Applications above these thresholds will be made directly to the Strategic Infrastructure division of An Bord Pleanála but Clare County Council will be consulted and will have input to this process

Policy and Legislation	Explanation	Planning Implications
The Water Framework Directive, 2000	<p>The EU Water Framework Directive is an important piece of EU environmental legislation which aims to improve the aquatic environment. It applies to rivers, lakes, groundwater, estuaries and coastal waters.</p> <p>Member States must aim to achieve good status in all waters by 2015 and must ensure that that status does not deteriorate in any waters.</p>	<p>Regard must be had to the objectives and measures for individual water bodies within the Shannon International River Basin District including the Shannon and Cloon Rivers.</p>
New Draft Regulations relating to Groundwater are being prepared and consultation on same ended in August 2009.	The aim of these is as follows:	<ul style="list-style-type: none"> - Establish a new strengthened regime for the protection of groundwater in line with the requirements of the Water Framework Directive (2000/60/EC) and the Groundwater Directive (2006/118/EC). - This is to be achieved by establishing clear environmental objectives, groundwater quality standards and threshold values for the classification of groundwater and the protection against pollution and deterioration - The Draft regulations also introduce the legal basis for a more flexible, proportionate and risk based approach to implementing the legal obligation to prevent or limit inputs of pollutants into groundwater which already exists under the old Groundwater Directive (80/69/EEC).
The Wildlife Act, 1976 and the Wildlife Amendment Act, 2000.		<p>These are the key statutory provisions for the protection of Wildlife (both Flora and Fauna) and the control of activities which may impact adversely on the conservation of wildlife.</p>
EU Birds Directive (79/409/EEC) Council Directive 79/409/EEC		<p>This provides for the protection of all wild bird species found to occur naturally in the EU.</p>
EU Habitats Directive (92/43/EEC) European Union (Natural Habitats) Regulations 94 of 1999, as amended SI 233/1998 and SI 378/2005.		<p>The focus of this Directive is to create a network of sites known as Natura 2000 sites known as SPAs and SACs which are collectively known as Natura 2000 sites. Member states have an obligation to ensure the habitats and species identified are maintained at a satisfactory conservation status or where habitats or species are considered unsatisfactory, that a favourable conservation status is achieved.</p>
Wind Energy Development Guidelines, Guidelines for Planning Authorities. (DoEHLG, 2006)	Guidelines advising planning authorities on planning for wind energy through development plan process.	<p>This strategy has been developed in line with these guidelines.</p>
Mid-West Regional Planning Guidelines, 2010-2022	Regional Development framework for the formulation of policies and strategy which seek to ensure the proper balance between the different settlements in the region with regard to development, population and services.	<p>A key theme is to ensure that the energy needs of the region are met and renewable energy is promoted. Advises that Planning Authorities at Development Plan level make provision for new uses of agricultural land including afforestation and alternative energy. Development plans should identify the areas within which renewable energy proposals of a particular type will be given favourable consideration or otherwise.</p> <p>An inter-county and inter-regional policy for the provision of afforestation and wind energy would be of particular importance.</p> <p>The Guidelines state that proposals must demonstrate that consideration has been given to the environmental and social impacts of the proposed development; the impact of the development on the landscape has been given due consideration; and connection to the National grid has been taken into account</p>

Policy and Legislation	Explanation	Planning Implications
Limerick Clare Climate Change Strategy, Limerick Clare Energy Agency, 2006.	<p>The aim of the Climate Change Strategy for the Mid West Region is to clearly identify the solutions to the challenge of reducing energy related emissions and to outline the actions to be taken to meet the requirements under the Kyoto Protocol. Estimates of the impact of these actions in terms of CO₂ reductions have been made and areas for future work identified. Within each study the following sections have been addressed</p> <ul style="list-style-type: none"> • Energy Production and Supply • Transport • Built Environment • Industry and Commercial Services • Agriculture and Forestry • Waste 	In particular, estimates relating to energy production and supply are relevant to this strategy.
Limerick Clare Energy & Emissions Balance, 2006	These documents were published and presented in June 2006. They were the first local reports on energy and CO ₂ emissions at a County level, to be published in Ireland. The reports formed the basis of the Mid-West Regional Climate Change Strategy.	These documents are presently under review and will provide support information for the County's own integrated energy balance & climate change strategy, under the revised County Development Plan
Limerick Clare Climate Change Strategy, 2006	The documents identify the required energy for social and economic development, and the consequences of using the present energy mix. Recommendations for renewable energy development and CO ₂ reductions are proposed.	
EU Directive 2006/32/EC	DIRECTIVE 2006/32/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (April 2006) on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC	SI No. 542 of 2009 European Communities (Energy End-Use Efficiency and Energy Services) Regulations 2009. Covers: Energy Efficiency Targets, Energy Services, Public Sector Obligations, Promotion of Energy Efficiency & other matters.
South Clare Local Area Plan, 2009 - 2015	Section 2.3 Renewable Energy. Policy IF5 Wind Farm Development	<p>The Council will assess applications for wind farm developments in relation to the Wind Farm Development Guidelines (DoEHLG, 2006) and the Wind farm Designations in the County Development Plan 2005-2011.</p> <p>Proposals for wind farm developments will be considered where it can be clearly demonstrated that:</p> <ol style="list-style-type: none"> a) They do not have an adverse visual impact on the landscape in which they are proposed; b) They do not have a significant adverse impact on a site of archaeological or historical importance or on Natura 2000 sites which have rare or protected flora and/or fauna or a delicate ecological character; c) Power lines between ESB points of generation and wind farm substations have, where possible, been laid underground to minimise visual impact.

Policy and Legislation	Explanation	Planning Implications
West Clare Local Area Plan 2009-2015	Section 6.12 Supply and Renewable Energy Policy INF S14 Wind Farm Developments	<p>The Council will assess applications for wind farm developments in relation to the Wind Farm Development Guidelines (DoEHLG, 2006).</p> <p>Proposals for wind farm developments will be considered where it can be clearly demonstrated that:</p> <ul style="list-style-type: none"> a) They do not have an adverse visual impact on the landscape in which they are proposed; and b) They do not have a significant adverse impact on a site of archaeological or historical importance or on sites which have rare or protected flora and/or fauna or a delicate ecological character; and c) Power lines between ESB points of generation and wind farm substations should, where possible, be laid underground to minimise visual impact.
EU Directive 2009/28/EC	<p>Directive 2009/28/EC on the promotion of the use of energy from renewable sources establishes the basis for the achievement of the EU's 20% renewable energy target by 2020. Under the terms of the Directive, each Member State is set an individually binding renewable energy target, which will contribute to the achievement of the overall EU goal.</p>	<p>Directive 2009/28/EC requires each Member State to adopt a national renewable energy action plan according to a standardised template. The National Renewable Energy Action Plan (NREAP) IRELAND sets out the Government's strategic approach and concrete measures to deliver on Ireland's 16% target under Directive 2009/28/EC.</p> <p>The Government has set the following targets: 40% electricity consumption from renewable sources by 2020; 12% renewable heat by 2020; 10% electric vehicles by 2020.</p>
County Heritage Plan 2003 to 2007	The County Heritage Plan establishes objectives, actions and targets in relation to heritage.	<p>One action relates to the integration of recommendations in the County Landscape Character Assessment in to future plans and strategies including Wind Farm developments. The LCA has been utilized in the preparation of the Wind Energy Strategy and is consistent with objectives of the Heritage Plan.</p>
Clare Local Biodiversity Action Plan		This is a plan arising out of the Clare Heritage Plan and its main aim is to conserve the biodiversity of County Clare.



1.4 Terms and Definitions

In developing this Wind Energy Strategy, it is important that all terms and definitions used throughout are understood and communicated clearly. A glossary of terms is presented at the end of this Wind Energy Strategy.

A wind farm development is composed of a number of elements. Table 1d presents typical elements of a Wind farm⁶:

**Table 1d:
Typical Elements of a Wind Farm.**

Item	Description
Wind Turbines	Composed of towers, nacelle, blades, transformers and concrete bases
Wind Monitoring Mast	Measures wind speeds over the site
Transformers	Serve each turbine
Internal Tracks	Provide access to turbines
Substation Compound	Include transformers, circuit breakers and control building
Power Cables	Usually underground within the site
Poles/pylons	Connecting wind energy development site to the national grid

⁶ Source: *Planning Guidelines for Wind Energy Development for Planning Authorities, 2006 Department of Environment, Heritage and Local Government*

For commercial operations, turbine heights of 75m to 125m to blade tip are assumed, as these represent the range of turbines submitted in planning applications in County Clare since 2000. The DoEHLG *Wind Energy Development Guidelines, Guidelines for Planning Authorities*, 2006 acknowledge that turbine heights will change over time but consider the following definitions:

- Small – less than 60 m to blade tip
- Medium – 75 to 100m to blade tip
- Large – over 100 m to blade tip.

In addition to turbine heights, the number of wind turbines in each development has been classified as follows:

- Small – 1 to 5 turbines
- Medium – 6 to 10 turbines
- Large – 11 to 25 turbines
- Very large – more than 25 turbines

However, this Wind Energy Strategy recognises that turbine heights are increasing and there is no prescription in relation to turbine heights. Each application will be assessed on its own merits against planning policy, objectives and legislation.



2

Methodology



2.1 Introduction

This section presents the methodology used to prepare the County Clare Wind Energy Strategy.

2.1.1 Energy (electricity)

Requirements

Presently County Clare needs 750GWh of electricity every year to support its general economy and society (over two million units of electricity every day). By 2020, the County's demand for electricity is expected to increase by approximately 10%.

Electricity is supplied to the County by numerous sources on the electricity transmission and distribution network (the grid).

The County, in keeping with national policy, wishes to source / generate its electricity from renewable resources. The degree to which County Clare can meet its electricity requirements from low carbon renewable resources will underpin its energy security and enable the County to establish a low carbon centre of commerce.

2.1.2 Wind Energy Resources

All economies have identified the need for greater sustainability in the provision of energy. Many countries generate their electricity requirements from a mixture of indigenous fossil fuels, nuclear fuel and renewable resources. Ireland's main indigenous fossil fuel resources have been peat and gas. County Clare has substantial renewable energy resources by way of wind, wave, tidal, solar, biomass etc. Clare has significant wind energy resources, which are some of the best in Europe. Figure B illustrates the available wind speeds within the County and the transmission network.

If the target of 550 MW of electricity from wind is installed it will reduce energy related CO₂ emissions in the county by over 1 million tonnes.

2.1.3 Regulation & Legislation

The European Union policies on energy security, renewable energy and climate change have resulted in a wide range of regulations and legislation seeking the development of low carbon renewable energy resources. The relevant legislation is detailed above in Table 1c.

The County Clare Wind Energy Strategy must recognise and reflect the national targets outlined. Furthermore the Strategy represents an opportunity to ensure that the national average of 40% is achieved.

2.1.4 Strategic Environmental Assessment (SEA)

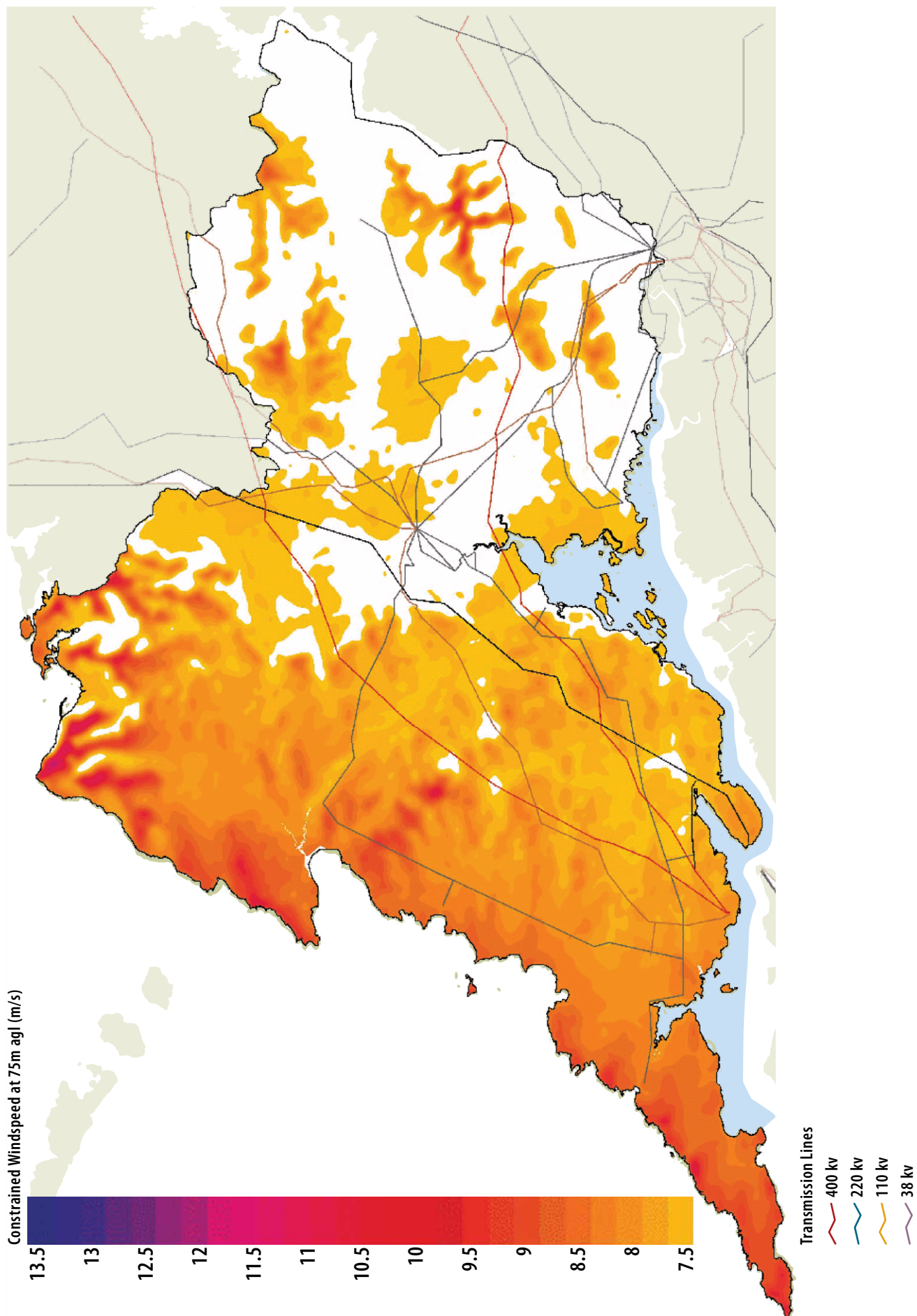
Strategic Environmental Assessment (SEA) is the process by which environmental considerations are required to be fully integrated into the preparation and adoption of plans and programmes, in this case the preparation of the Wind Energy Strategy.

Article 1 of the SEA Directive states *"The objective of the SEA process is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of specified plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment"*.

2.1.5 Habitats Directive Assessment (HDA)

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) formed a basis for the designation of Special Areas of Conservation. Similarly, Special Protection Areas are legislated for under the Birds Directive (Council Directive 79/409/EEC on the Conservation of Wild Birds). Collectively, SAC's and SPA's are referred to as Natura 2000 sites.

Figure B:
Wind Resources and Transmission Network



In general terms, they are considered to be of exceptional importance in terms of rare, endangered or vulnerable habitats and species within the European Community. Under Article 6(3) of the Habitats Directive an Appropriate Assessment must be undertaken for any plan or program that is likely to have a significant effect on the conservation objectives of a Natura 2000 site.

An Appropriate Assessment is an evaluation of the potential impacts of a plan on the conservation objectives of a Natura 2000 site, and the development, where necessary, of mitigation or avoidance measures to preclude negative effects. Principally the purpose of an Appropriate Assessment is to identify the possible effects of implementing this Wind Energy Strategy on the conservation status of designated Natura 2000 sites within the County.

2.2 Methodology

The methodology for this Wind Energy Strategy has been informed by the DoEHLG planning guidelines; *Wind Energy Development, Guidelines for Planning Authorities* (DoEHLG, 2006). Reference is also made to the relevant environmental and landscape objectives in the Clare County Development Plan 2011-2017.

A Geographical Information System (GIS) was established to map and analyse a number of important themes to be considered in developing this Strategy. The SEA and HDA processes have also informed this methodology and the identification of areas in the Wind Energy Strategy by highlighting significant environmental issues and assisting in developing mitigation measures reflected in Section 3 of the Strategy and the associated SEA Environmental Report and Appropriate Assessment Report.

2.3 Geographical Information System (GIS)

2.3.1 Wind Resource Mapping.

The Sustainable Energy Ireland (SEI) Wind Atlas 2003 was utilised to extract data on constrained wind resources for County Clare. The SEI Wind Atlas provides information on wind speeds modeled at heights 50m, 75m and 100m above ground level. The GIS analysed wind speeds in the County above 7.5m per second using turbine heights of 75m. For the purposes of this strategy, 75m turbine heights were utilised as this reflects the lower turbine heights for commercial wind operators. The areas considered economically viable have wind speeds above 7.5m per second at 75m height above ground level.

2.3.2 Transmission Network

A second consideration in identifying areas for wind farm development relates to access and proximity to the transmission network. County Clare is fortunate in that there are a number of large electricity transmission lines running approximately north to northeast across the County from the Moneypoint Generating Station (Figure B). Proximity to these lines and ability to connect into them is a significant consideration for the siting of commercial wind farms. As a general rule, the larger wind energy developments need to access the larger power lines such as the 400kv or 220 kv lines. Smaller wind energy developments can access into the smaller capacity network such as 110 or 38kv. However, various technical considerations also come into play regarding accessing the transmission network. County Clare is considered to have excellent infrastructural capacity associated with the larger transmission lines already in the County.

2.3.3 Proximity to Residential Properties

A GIS system was used to create buffer zones of 400 metres from properties (residential and commercial). This was overlaid with data on sufficient wind speeds and proximity to the grid to identify potential strategic sites.

2.3.4 Natural Heritage Designations

All current natural heritage designations provided under European and National legislation were incorporated into the GIS. These include candidate Special Areas of Conservation (cSAC), Special Protection Areas (SPA), Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHA's). The following additional habitat data from Clare County Council was also entered into the GIS:

- Hurley Keegan Habitat Map
- Tubridy Habitat Survey
- Conaghan Fuller Survey
- Lough Derg Habitats
- Lough Derg Special Areas, WL1_Hedgerows Lough Derg, WL2_Tree Lines Lough Derg
- RPS Cratloe
- South Clare Habitat Map, WL1_Hedgerows, WL2_Treelines, CWS Drainage Ditches, CWS Polygon Habitats, CWS Rivers, CWS Site Boundaries, CWS Spring Sites

A Habitats Directive Assessment was undertaken to assess the impacts of this Strategy on sites designated as SAC's and SPA's. In addition, the SEA process has assessed wider potential biodiversity impacts in relation to this Strategy. All cSAC's, SPA's, NHA's and pNHA's were excluded from potential strategic areas. In addition, one 'Acceptable in Principle' Area contains three such pNHA's. However, a number of NHA's are located within the 'Acceptable in Principle' areas.

2.3.5 Landscape and Visual Impacts

It was noted in Section 1 that landscape designations in the previous Clare County Development Plan 2005-2011 and the preparation of the Clare County Development Plan 2011 – 2017 informed this Strategy. These included areas designated as scenic routes and vulnerable landscapes in the previous plan and areas designated as Heritage Landscape and Scenic Routes in the current plan. In addition, the Landscape Character Assessment of County Clare was used as a baseline to assess capacity for areas to accommodate wind farm developments.

Neighbouring counties' land use designations such as scenic routes, or areas of primary amenity were also integrated. This data incorporated the counties of Galway, North Tipperary, County Limerick and County Kerry (up to a 50km buffer from Clare County boundaries).

In addition, viewshed analysis was undertaken for certain upland areas, namely Sliabh Callan, Sliabh Bernagh and Sliabh Aughties. A viewshed is an area that is visible from a specific location based on elevation values of a digital elevation model (DEM).

While these viewsheds are a useful guide, they do not take account of screening offered by vegetation or buildings so should not be considered definitive and do not replace more detailed modeling required for site specific wind farm developments.

Maps B and E in Volume 2 of the Clare County Development Plan 2011-2017 illustrate the landscape and heritage designations within the County.

2.3.6 Architectural Heritage

All Architectural Conservation Areas (ACAs) within 5km of the strategic and 'Acceptable in Principle' areas were mapped. Protected structures from the previous County Development Plan 2005 - 2011 were also mapped for 5km within 'Strategic/Acceptable in Principle' areas.

2.3.7 Archaeology

Generally, archaeological impacts associated with wind farm developments are site specific. Nonetheless, there are significant clusters of archaeological sites or archaeological landscapes within the County, most notably within the Burren region.

In addition, there are a number of sites and monuments under public ownership or guardianship that represent a current or future tourism resource. Whilst not precluding wind farm development, the visual impact of wind farms on such sites and archaeological landscapes should be carefully considered. Figure C illustrates the sites of known archaeological resources in the County.

2.3.8 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. Frequently these areas are subject to natural heritage designations. In particular, established tourism and recreational areas such as the Burren, Lough Derg and coastal areas were considered to be more sensitive to wind farm developments by virtue of their high scenic value, recreational / tourist functions, natural heritage designations or archaeological resources.

2.3.9 Landslide Susceptibility

The issue of landslide risk associated with wind farm developments particularly on peat soils was raised following consultation with the Geological Survey of Ireland (GSI) and the National Parks and Wildlife Service (NPWS). Following discussions with the GSI, sites of historical landslides and slopes greater than 15 degrees were mapped. Discussions with the NPWS suggested that landslides may be a risk at slopes of 4 degrees, depending on peat depth. 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. Therefore, this mapping is only a broad guide and does not replace more detailed site analysis.

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.

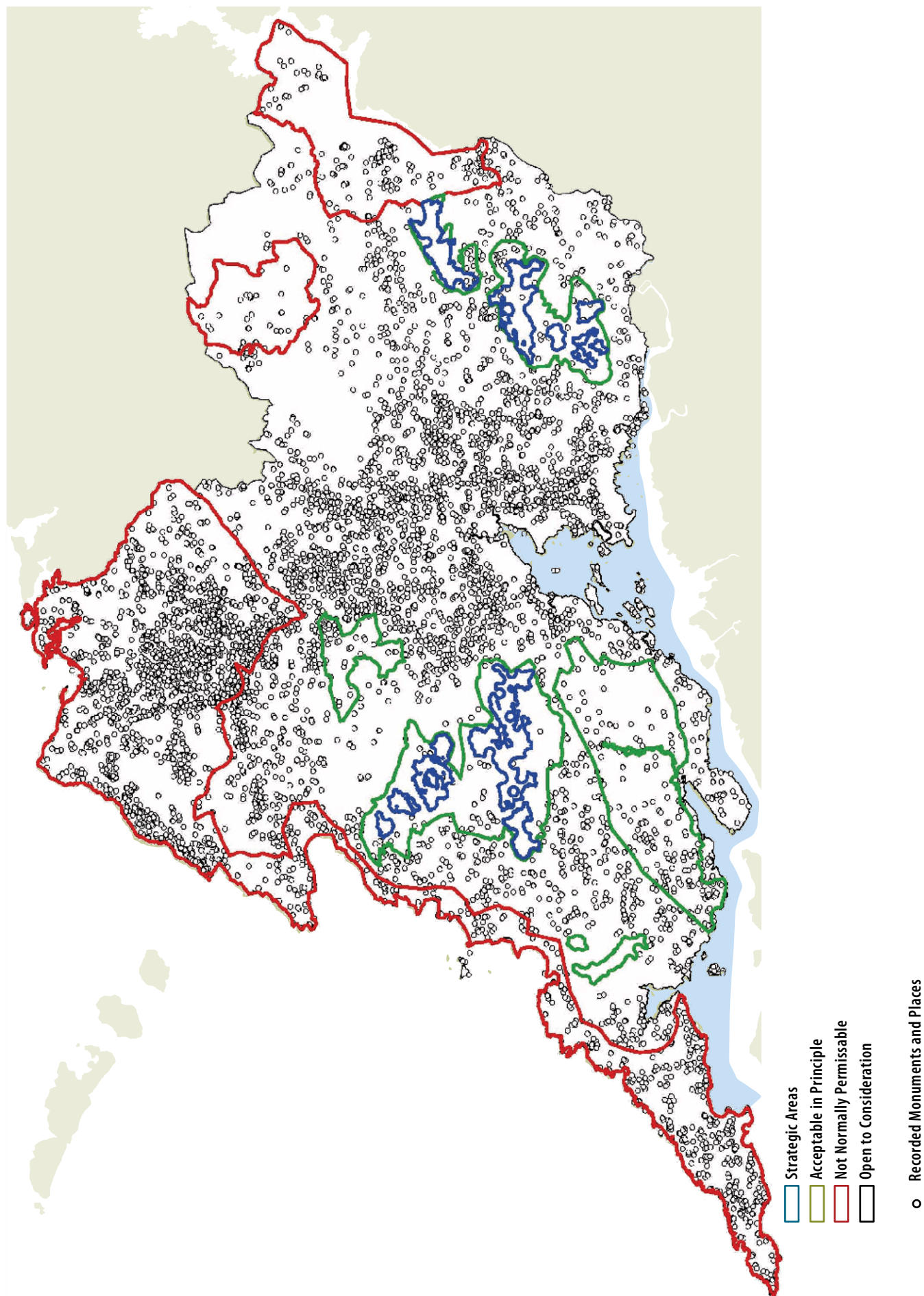
2.4 Fieldwork

Following the GIS analysis, team members undertook fieldwork in the areas of the County that were identified as having sufficient wind speeds and proximity to the grid to merit closer scrutiny. This fieldwork was undertaken in June 2009 and assessed the following:

- Impacts of existing and permitted wind farms in the County
- Ecological and land use issues in these areas
- Landscape and visual characteristics



Figure C:
Archaeological Sites



2.5 Consultation

In addition to the above technical assessment, consultation to date was undertaken as follows:

- i Public Consultation:** Advertisements by Clare County Council in March 2009 seeking public submissions. A total of 36 submissions were received and the issues raised have informed the development of this Strategy. As part of the preparation of the Draft Clare County Development Plan 2011-2017 and Draft Wind Energy Strategy 2011-2017, submissions were received as part of the Statutory Development Plan making process.
- ii SEA and HDA Scoping Consultation:** This is required as part of the SEA and HDA process. At the scoping stage of the SEA process, statutory and non-statutory consultees were contacted with a view to obtaining information/comments requested on the scope or level of detail of environmental issues to be addressed in the SEA. A total of 25 public bodies were contacted to as part of the SEA Scoping exercise. As part of the preparation of the Draft Clare County Development Plan 2011-2017 and Draft Wind Energy Strategy 2011-2017, submissions were received on the SEA and HDA as part of the Statutory Development Plan making process.
- iii Consultation with Agencies:** A number of fact finding meetings have been held with the following organisations:
 - Clare County Council Planning Section
 - Irish Wind Energy Association
 - Eirgrid
 - Shannon Development
 - Limerick Clare Energy Agency
 - University of Limerick
 - Environmental Protection Agency (as part of the Strategic Environmental Assessment process)
 - Geological Survey of Ireland
 - National Parks and Wildlife Service (as part of the Habitats Directive Assessment process)

2.6 How the SEA and HDA informed the Wind Energy Strategy

SEA and HDA have been carried out in relation to the Clare County Development Plan 2011-2017 and have incorporated the Wind Energy Strategy and associated SEA and HDA reports. During the scoping stage of the SEA it was recognised that the Wind Energy Strategy may have the potential to significantly impact upon Natura 2000 sites. The potential for likely significant effects to occur initiated the need for a HDA. The SEA and HDA helped to define areas for wind energy development and ensured that highly sensitive environmental resources were avoided or potential negative impacts highlighted and addressed through mitigation measures. The SEA also assessed a number of alternatives and these are presented below. **Table 2a** presents an overview of areas of interest for the Wind Energy Strategy and outlines why these areas were excluded at SEA and HDA level.

Option One: Do nothing scenario

This option would involve retaining the existing Wind Energy Strategy. However, as the targets in this Strategy only plan for the period up to 2011, this would not facilitate the guidance of wind energy development up to 2017.

Option Two: Ad-hoc planning for wind farm development

This option would involve wind energy applications being assessed on a case-by-case basis without an overall strategic framework to guide wind farm development in County Clare. This is not in line with existing planning guidance for wind energy development and would not facilitate an evaluation of cumulative impacts associated with wind farm development. In addition, the lack of a strategic evaluation of this land use would not be in keeping with the SEA Directive.

Option Three: Alternative Renewable Energy Sources

This option would involve planning for alternative renewable energy sources such as biomass or tidal power in seeking to achieve a target that reflects the national target of 40% renewable energy production by 2020. The reason this is not being investigated for this strategy is that whilst other renewable energies can and will contribute to this target, in practice County Clare has a significant wind resource, and at national level, Ireland has experience in planning and managing this technology. Wind energy technology is currently the most established and experienced renewable technology in this country hence the focus for the lifetime of this strategy (2011 to 2017) remains on wind energy planning. This option was excluded at an early stage in the SEA process as it was not considered a realistic alternative.

Option Four: Offshore Wind Energy Development

This scenario would see the direction of wind farms to the offshore areas of County Clare as a means of achieving renewable energy targets. It is unlikely that the County could achieve significant renewable energy production from off shore wind energy development within the timeframe envisaged for the Wind Energy Strategy. In addition, Sustainable Energy Authority of Ireland are in the process of identifying appropriate areas for offshore renewable energy production around Ireland, so this will assist in directing renewable energy production including offshore wind farms to appropriate sites.

Option Five: Offshore and onshore Wind Energy Development

This scenario would direct wind energy developments to both on shore and offshore areas in and around County Clare as a means of achieving renewable energy targets. It is unlikely that the County could achieve significant renewable energy production from a combination of on and off shore wind energy within the timeframe envisaged for this Wind Energy Strategy.

Option Six: Alternative targets and alternative timeframes

This scenario would assess different renewable energy targets and timeframes as a means of achieving a 2020 renewable energy target of 40% electricity production from renewable energy resources. The target of 550 MW has been developed in consultation with a number of agencies and represents a realistic target that can be achieved over the lifetime of the Wind Energy Strategy.

Option Seven: Strategic Approach to on shore Wind Energy Development

This is the approach taken by Clare County Council in undertaking this work and SEA and HDA. It recognises where the principal wind resources are and matches them to existing infrastructure – two critical considerations for wind energy development. In addition, the identification of ‘Strategic’ and ‘Acceptable in Principle’ areas permits a comprehensive assessment of environmental resources within and close to these areas, facilitating a more robust SEA and HDA process that informs the development of the Wind Energy Strategy. It allows for a medium term view of wind energy developments in the County and encourages clustering or sharing of infrastructure associated with wind energy development such as access roads.

In summary, the significant environmental impacts would be as follows;

- Facilitates a strategic and plan led approach to wind energy development in the County.
- In turn, this permits the more accurate analysis of existing environmental resources, potential impacts and identification of mitigation measures where necessary.
- Facilitates the avoidance of particularly sensitive resources where necessary.
- Allows for a cumulative assessment of wind energy developments within the County.
- Allows the County and potential applicants a means to progress wind energy developments within robust strategic areas in the County, assisting the County in increasing renewable energy targets.

Table 2a:
How the SEA and HDA influenced inclusion and exclusion of certain areas in the Wind Energy Strategy

Areas and criteria	Reason for exclusion
Sliabh Aughties – good wind speeds, remote, proximity to grid. These criteria could support this area being designated as 'Strategic' or 'Acceptable in Principle'.	NPWS expressed concern about cumulative impacts of wind farms in this area which is a Special Protection Area. The Habitats Directive Assessment could not state that adverse impacts would not arise due to implementation of the Wind Energy Strategy on the conservation objectives of the SPA. Therefore, this area was not proposed as 'Strategic' or 'Acceptable in Principle' and is proposed as 'Open for Consideration' instead.
Coastline – high wind speeds, some parts remote, not close to grid	Extensive number of natural heritage designations including SPAs and cSAC's. Importance of recreational and tourism resources in these areas also creates a greater visual sensitivity. This may be reviewed over time in light of requirements for renewable energy, climate change measures and energy security.
All of Sliabh Bernagh – good wind speeds, proximity to grid, remote in parts	Special Area of Conservation principally around summit and unenclosed areas. In addition, a number of steep slopes indicating potential landslide susceptibility. Landscape and visual impacts associated with Lough Derg.
Loop Head – good wind speeds, sparsely populated in parts, access to lower voltage grid	Is not close to existing high voltage transmission, number of natural heritage designations, flat and low-lying in many areas creating higher landscape impacts. Spectacular peninsular landform and current and potential tourism and recreation.

2.6.1 Defining Areas for Wind Farm Development

Particular attention was paid to identifying strategic sites of regional or national importance. The objective in identifying such sites was to ensure that there were no significant environmental considerations, which could reasonably be foreseen to arise in advance of the planning process. Therefore, following the above methodology, the following criteria were applied to each zoning:

Hierarchy	Criteria
Strategic Sites	Viable Wind Speeds
	Proximity to grid
	Slopes less than 15 degrees Excludes all cSAC's, SPAs and NHA's 400 m from properties receiving post (residential and commercial)
Acceptable in Principle	Viable Wind Speeds
	Proximity to grid
	Slopes less than 15 degrees Excludes cSAC's and SPAs and avoids most NHA's. The NHA's included wholly or partly in this designation are listed in Annex A. General Considerations. Low population density
Open for Consideration	The wind speeds vary across the remainder of the County, though stronger wind speeds are found on the western part of the County. Proximity to the grid and densely populated areas varies throughout this area.
Not Normally Permissible	Large number of natural heritage designations or
	Important recreational / tourism area
	Large number of archaeological sites HDA and SEA recommended against these areas being included.



3

Wind Energy Objectives



3.1 Introduction

This section outlines the main objective provisions of the Wind Energy Strategy developed within the statutory and policy framework outlined in Section One. Figure D and Map D (accompanying map at the end of the document) show the wind energy designation areas for the County.

3.2 General Objectives for Wind Energy Developments

WES One: Development of Renewable Energy Generation

It is the objective of the Council to support, in principle and in appropriate scales and locations, the development of wind energy resources in County Clare. It is 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 within the County.

WES Two: Development of Low Carbon Economy

County Clare will seek to promote itself as moving towards becoming a low carbon County by 2017 as a means of attracting inward investment to the County and the wider Mid-West region.

WES Three: County Partnership Approach

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

WES Four: Response to National Policy

The White Paper on Energy has set a target of 40% of electricity to be generated from renewable sources by 2020. In the Mid-West Regional Climate Change Strategy, County Clare is identified as having a potential 600MW energy produced from renewables by 2020.

Clare County Council will aim to achieve a minimum target of 550MW from wind energy by the conclusion of this Strategy.

WES Five: Promotion of Community Involvement

Clare County Council will seek to promote community involvement and require community benefit where possible in Wind farm developments.

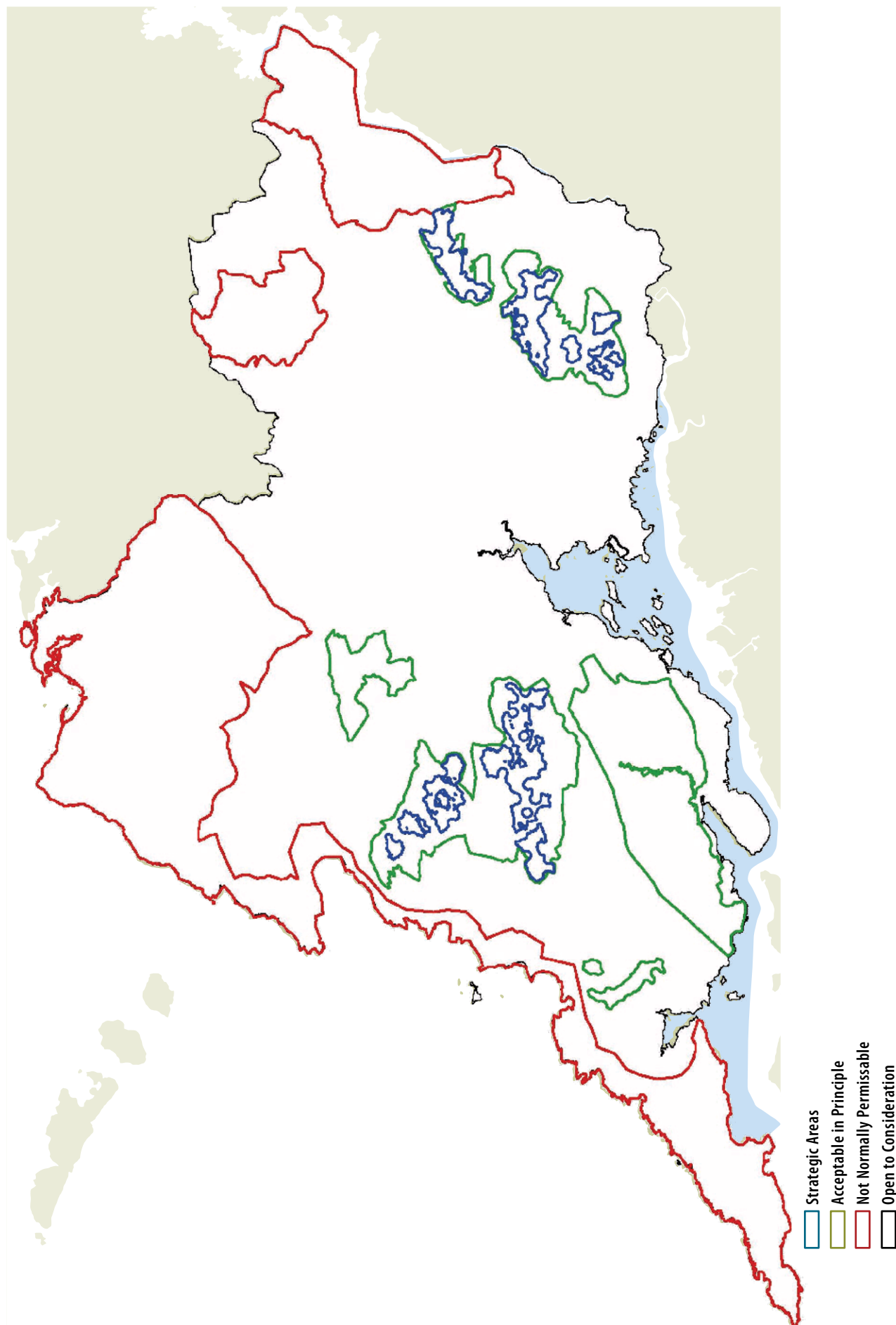
WES Six: Infrastructure Development Proposals

Proposals for the development of infrastructure for the production, storage and distribution of electricity through the harnessing of wind energy will be considered in appropriate sites and locations, subject to relevant policy, legislation and environmental considerations.

WES Seven: Natura 2000 Sites

Having regard to the provisions of the Habitats Directive 92/43/EEC, where a proposed development will give rise to significant adverse direct, indirect or secondary impacts on Natura 2000 sites, (either individually or in combination with other plans or projects), permission will only be granted where there is no alternative solution and where there are imperative reasons of overriding public interest in favour of granting permission, including those of a social or economic nature.

Figure D:
Strategic Windfarm Development Areas



3.3 Specific Area Objectives

Four classifications have been developed for wind farm development in County Clare and specific objectives pertaining to each are presented below. Each application for development will be considered in line with existing planning policy, objectives and legislation.

WES Eight: 'Strategic Areas'

These key areas are considered to be eminently suitable for wind farm development and are of strategic importance because of;

- Good / excellent wind resources
- Access to grid
- Distance from properties and
- Outside any Natura 2000 sites

Projects within these areas must:

- Demonstrate conformity with existing and approved wind farms to avoid visual clutter.
- Be designed and developed in line with the *Wind Energy Development Guidelines, Guidelines for Planning Authorities* (DoEHLG, 2006) in terms of siting, layout and environmental studies.
- Provide a Habitats Directive Assessment under Article 6 of the Habitat Regulations if the site is located in close proximity to a Special Area of Conservation or Special Protection Area.
- Be developed in a comprehensive manner avoiding the piecemeal development of the areas designated as 'strategic'.

Target wind energy generation from strategic areas is 400 MW

WES Nine: 'Acceptable in Principle'

These areas are considered suitable for wind farm development because of:

- Sufficient wind speeds,
- Access to grid network, and
- Established patterns of inquiries.

Projects within these areas must:

- Demonstrate conformity with existing and approved wind farms to avoid visual clutter.
- Designed and developed in line with the Planning Guidelines in terms of siting, layout and environmental studies.
- Provide a Habitats Directive Assessment under Article 6 of the Habitat Regulations if situated in proximity to a Special Area of Conservation or Special Protection Area will require.

Target wind energy generation from Acceptable in Principle areas is 150 MW

WES Ten: 'Open to 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 Eleven: 'Not Normally Permissible'

These areas are not in principle considered suitable for wind farm development due to their overall sensitivity arising from landscape, ecological, recreational and/or cultural and built heritage resources. The HDA and SEA process in particular assisted in the identification of these areas.

WES Twelve: 'Autoproducers'

It is the objective of the Council to facilitate, where appropriate, small scale wind energy development by industrial 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:

- The energy will be primarily generated for use on the site and within the site boundary.
- Noise and visual impacts including shadow flicker will not be significant on nearby residents.
- If located within or close to a Special Protection Area or Special Area of Conservation, a Habitats Directive Assessment and /or Environmental Impact Assessment may be required.

3.4 Planning Exemptions for Wind Development

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, No.235 of 2008 and No.256 of 2008. Further information on these exempted developments is available by downloading the above statutory instruments or by contacting Clare County Council, the Limerick Clare Energy Agency or Department of Environment, Heritage and Local Government.

4

Advice on Landscape Capacity for wind energy developments based on Landscape Character Areas (LCA's)



4.1 Introduction

This section addresses the landscape capacity of the areas in the County that have been identified as ‘Strategic’, ‘Acceptable in Principle’, ‘Open for Consideration’ or ‘Not Normally Permissible’. The purpose of this section is to advise, in broad terms, what capacity each LCA has for wind farm development and, indicates the scale of wind farm developments that may be acceptable within a LCA in terms of cumulative impacts.

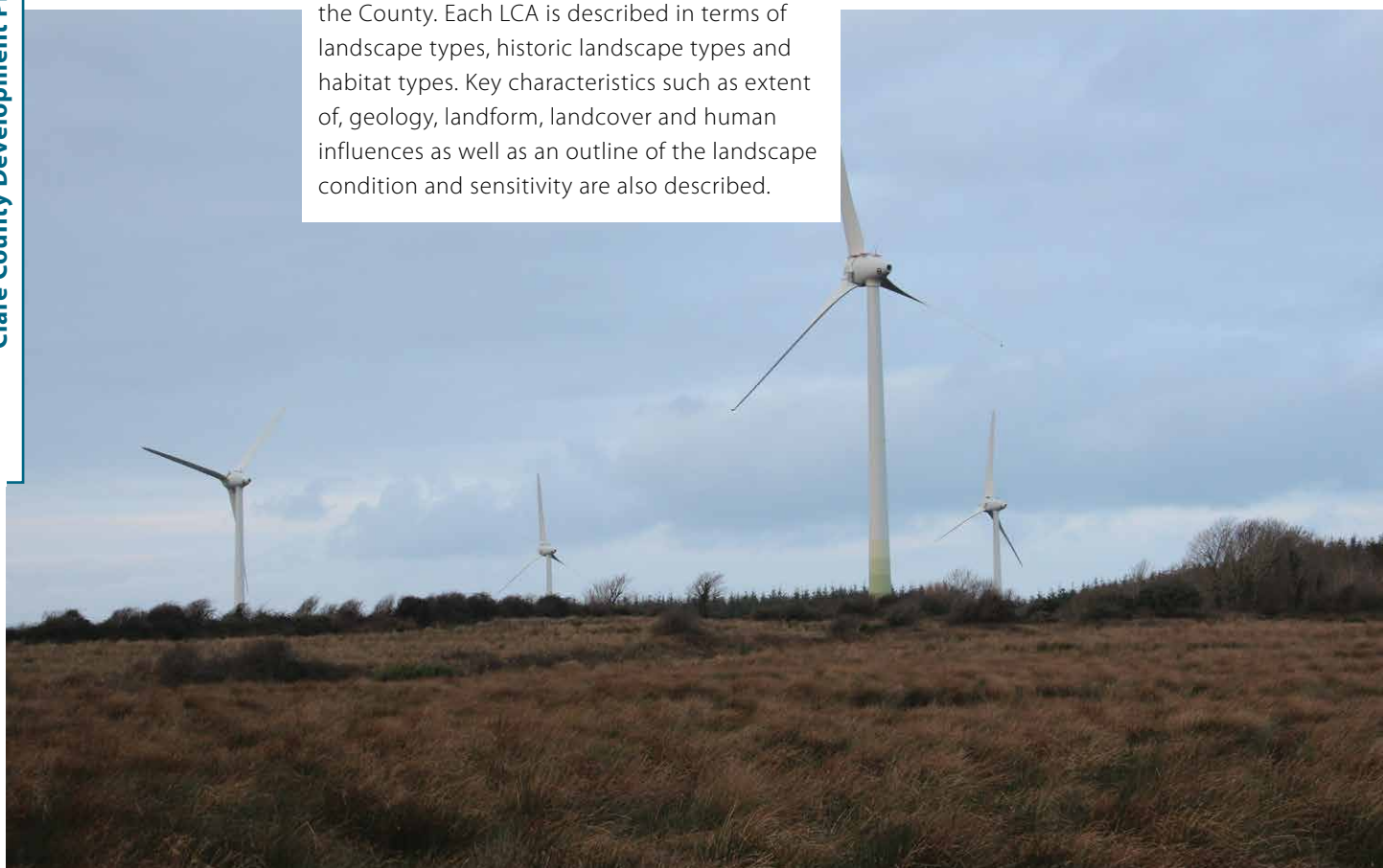
As the objectives suggests, applications in these areas will be assessed on a case-by-case basis and it is intended that the following advice will assist both community and commercial developers in identifying appropriate areas. These tables are provided as a guide only to the capacity of landscapes in the County and Clare County Council will seek to balance landscape considerations with the strategic importance of achieving targets in the *National Climate Change Strategy 2007-2012* (DoEHLG, 2007) and renewable energy targets.

A Landscape Character Assessment was undertaken in the County in 2002 and it described in broad terms the 21 different Landscape Character Areas (LCA) identified for the County. Each LCA is described in terms of landscape types, historic landscape types and habitat types. Key characteristics such as extent of, geology, landform, landcover and human influences as well as an outline of the landscape condition and sensitivity are also described.

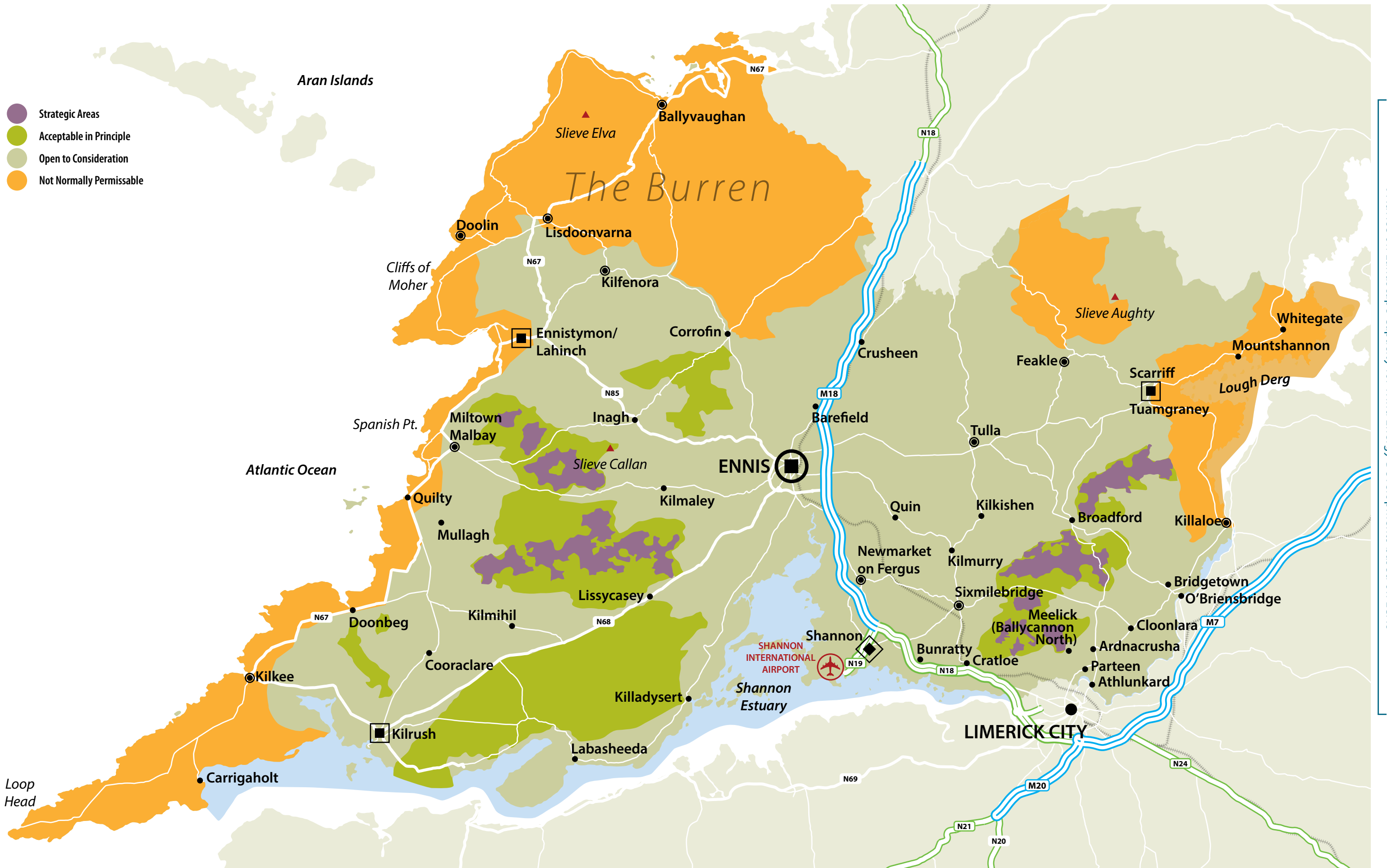
Landscape Character Types (LCT) are also used in the *Wind Energy Development Guidelines, Guidelines for Planning Authorities* (DoEHLG, 2006) as a means of identifying the most appropriate scale and layout of wind energy developments in these areas. The 6 LCTs identified in these guidelines can correspond to some of the LCTs identified in the County Clare LCA. Table 4a below presents this advice for each of the LCA’s within the ‘Strategic’ and ‘Acceptable in Principle’ areas. Further details are provided in Chapter Six of the Planning Guidelines.

The tables below set out the general advice that will be applicable in terms of each LCA. Each LCA was assessed in terms of key landscape and visual characteristics and features, overall sensitivity to wind farm developments (from large developments of 11 to 20 turbines to small, defined as less than 5 turbines) and overall capacity of the LCA to accommodate wind farms.

Annex B presents the survey forms for all the LCA’s within the County, including those that may lie fully or partially within other wind farm zonings such as the ‘Strategic Areas’ or ‘Not Normally Permissible’ areas. Figures E and F show the LCA’s and LCT’s respectively within the County.



Wind Energy Designations





Landscape Character Areas

- | | | | |
|-------------------------------|---------------------------|------------------------------------|-----------------------------|
| 1 Burren Uplands | 7 Lough Derg Basin | 13 Ennis Drumlin Farmland | 18 Shannon Estuary Farmland |
| 2 Low Burren | 8 Slieve Bernagh Uplands | 14 Fergus Estuary | 19 Kilrush Farmland |
| 3 Cliffs of Moher and Lahinch | 9 River Shannon Farmland | 15 Kilnamona High Drumlin Farmland | 20 Malbay Coastal Farmland |
| 4 Fergus Loughlands | 10 Sixmilebridge Farmland | 16 Cullenagh River Farmlands | 21 Loop Head |
| 5 Slieve Aughty Uplands | 11 East Clare Loughlands | 17 Slieve Callan Upland | |
| 6 Lough Graney | 12 Tulla Drumlin Farmland | | |

- Strategic Areas
- Acceptable in Principle
- Not Normally Permissible
- Open to Consideration

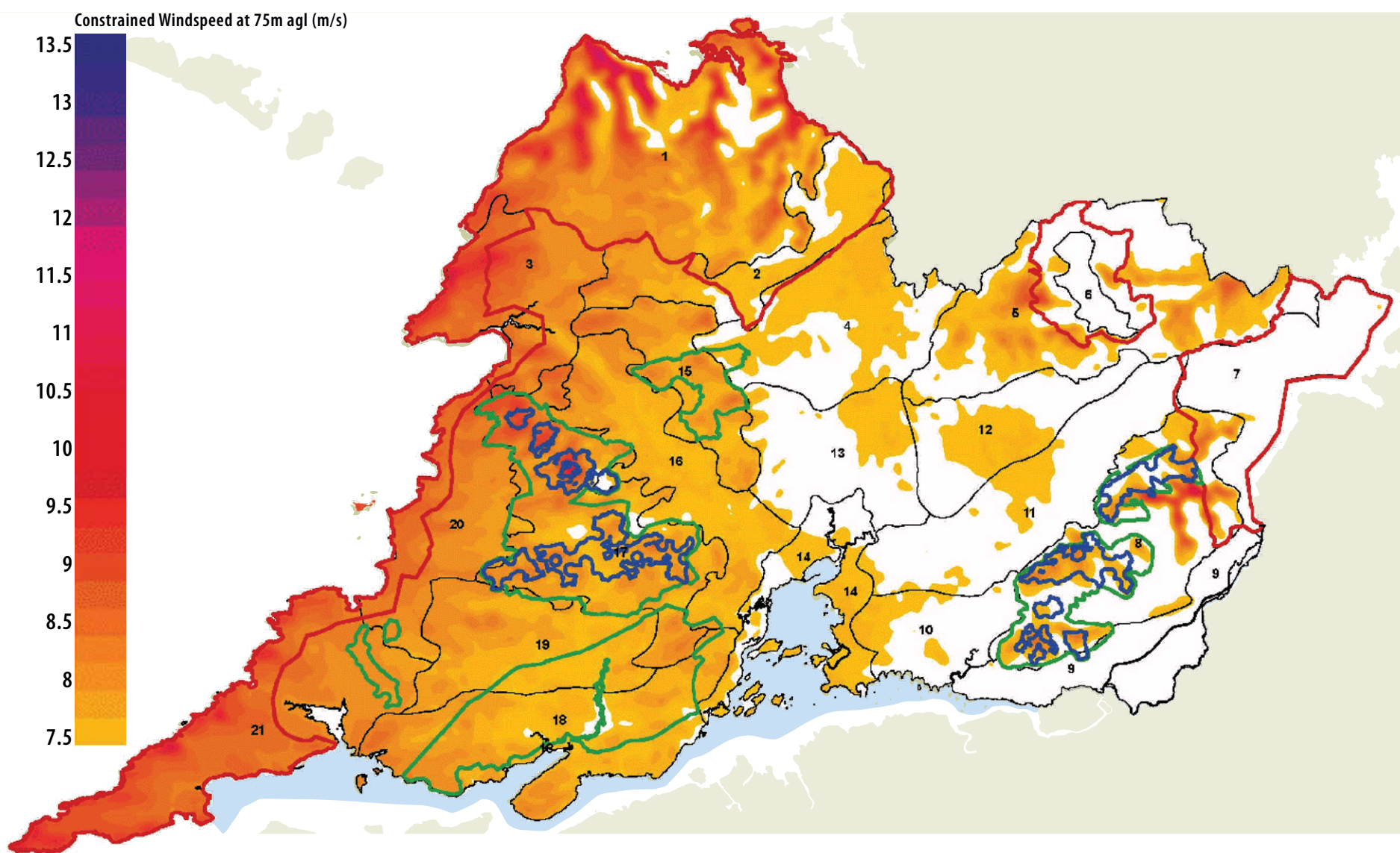


Figure E:
Wind Resources Within Landscape Character Areas

**Figure F:
Landscape Character Types**

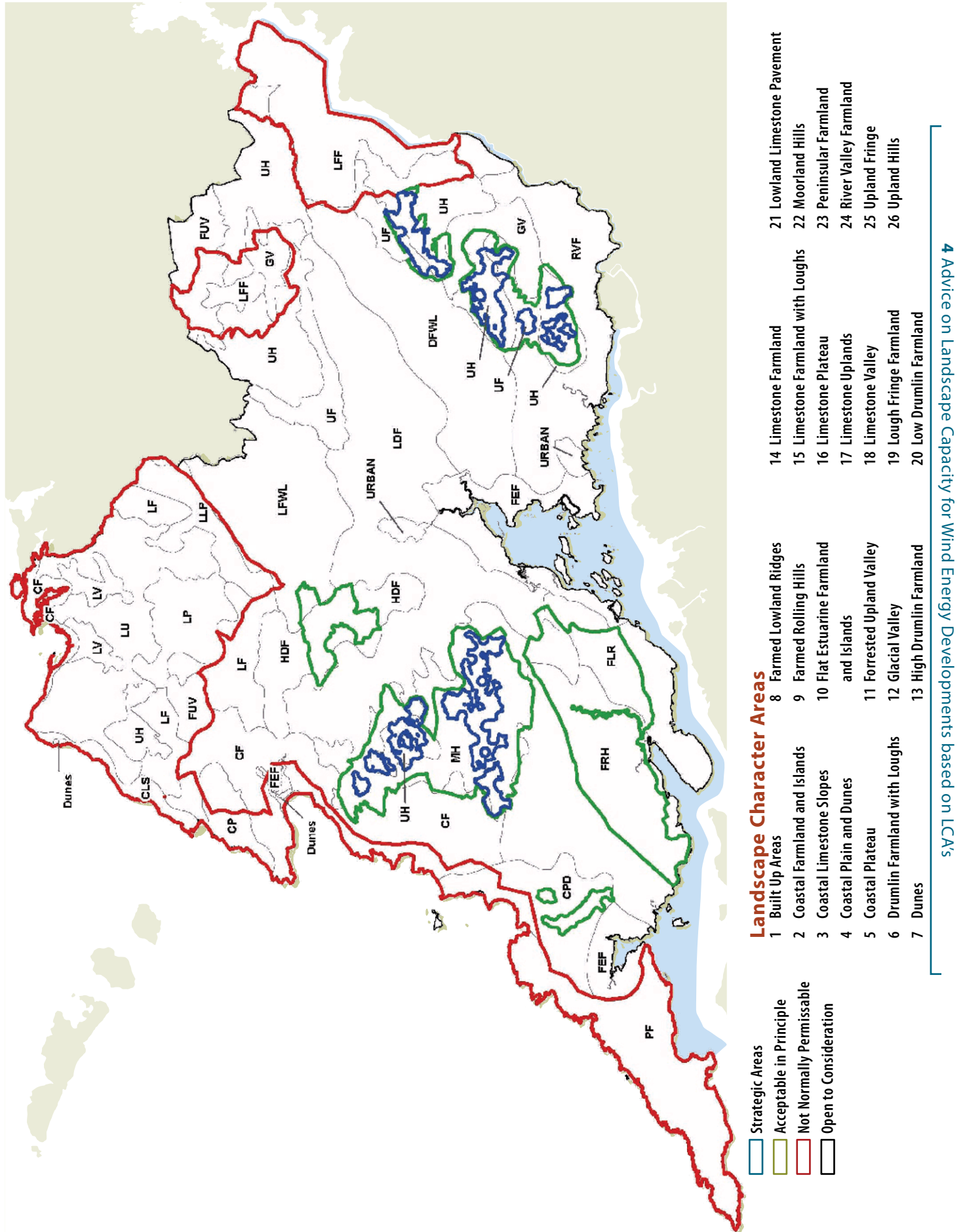


Table 4a:
Strategic Guidance on Landscape Capacity for Wind Energy Developments

LCA's within areas designated as Strategic Areas						
LCA	Overall Sensitivity to Wind Farm Developments	Appropriate size of wind farms (turbine numbers)	Capacity	LCTs in Co. Clare. LCA and Corresponding LCTs in 2006 Planning Guidelines	Cumulative Advice from 2006 Planning Guidelines	
Sliabh Callan This LCA encompasses upland hills and slopes of Sliabh Callan and Ben Dash	Medium to Low	Large	The rolling hills, low settlement, extensive plantations reduce the overall sensitivity of this LCA to wind farm development. The area could accommodate a number of large or medium wind farms subject to careful siting to avoid significant impacts on skylines. Potential Renewable Energy Generation for this area is 250 MW (Limerick Clare Energy Agency).	Upland Hills Moorland Hills Planning Guidelines: Moorland Mountain	Acceptable, depending on topography as well as siting and design of wind energy developments involved.	
Sliabh Bernagh Uplands This LCA encompasses the Sliabh Bernagh Range and Broadford Hills.	Medium to low	Large	There are certain parts of this LCA that are highly sensitive due to their nature designations and scenic qualities. In particular, the foothills and mountains over-looking Lough Derg and the unenclosed bogs of Lackerragh and Glenvagalliagh Mountain. However, other areas on the north west and westerly aspects of the mountain are more robust and can accommodate number of large or medium wind farms. In the Broadford Hills areas, the areas around Woodcock Hill, Ballycar, Corlea and Knockaunnamoughily are identified as Strategic Areas. Potential Renewable Energy Generation for this area is 150 MW (LCEA).	Upland Hills Upland Fringe Glacial Valley. Planning Guidelines: Moorland Mountain	Acceptable, depending on topography as well as siting and design of wind energy developments involved.	
LCA's within areas designated as Acceptable in Principle						
LCA	Overall Sensitivity to Wind Farm Developments	Appropriate size of wind farms (turbine numbers)	Capacity	LCTs in Co. Clare. LCA and Corresponding LCTs in 2006 Planning Guidelines	Cumulative Advice from 2006 Planning Guidelines	
Kilnamona High Drumlins	Medium to low	Large to medium	This area has some capacity for wind farm development owing to the topography, declining agricultural activity and dispersed settlement.	High Drumlin Farmland Planning Guidelines: Hills and Flat farmland	Acceptable depending on appropriate siting and design	
Shannon Estuary	Medium to Low	Large to medium	This LCA has some capacity for large to small wind farms in part due to the quite industrial nature of the area close to Moneypoint and the capacity of the ridged hills to accommodate wind energy developments.	Farmed lowland ridges Planning Guidelines: Hills and Flat farmland	Acceptable depending on appropriate siting and design	
Part of Loop Head LCA north of Kilrush close to Moanmore	Medium	Medium	This particular area proposed as 'Acceptable In Principle' relates to the area around the existing wind energy development where the operating wind farm has become an established landuse and contributes to the landscape character. However the remainder of the Loop Head LCA is considered to be more sensitive to such development due to the open character, spectacular coastline especially in the north and significant natural heritage designations around Loop Head and Poulmasherry Bay.	Peninsular farmland Farmed estuarine and islands Coastal plain and dunes Planning Guidelines: Coast though this does not cover the range of LCTS in this area.	A second wind farm may be acceptable only at a very great distance with minimal visual presence.	

LCA's within areas designated as Open for Consideration

LCA	Overall Sensitivity to Wind Farm Developments	Appropriate size of wind farms (turbine numbers)	Capacity	LCTs in Co. Clare. LCA and Corresponding LCTs in 2006 Planning Guidelines	Cumulative Advice from 2006 Planning Guidelines
Kilmihil Farmlands. Part of this LCA lies within an 'Acceptable in Principle' area	Medium	Medium/large	The rolling hills and drumlins in this sparsely settled areas offer capacity to accommodate wind farm development.		
Cliffs of Moher and Lahinch	High	Small	Upland areas away from the tourism and recreational areas may support small wind farm developments of up to 5 turbines. The exposed nature of the area would require careful siting.		
River Shannon Farmlands	Medium	Small or medium	There is some capacity in the southern part of this LCA for development away from Lough Derg and Killaloe. Small or medium wind farms would be most appropriate. Due to the low lying nature of the LCA, lower turbine height would be most appropriate.		
Sixmilebridge Farmlands	Medium	Small or medium	There is some capacity in the undulating more enclosed parts of this LCA to accommodate small or medium wind farms. The industrial area around Shannon Free zone may offer potential for auto-production developments. Any developments would have to conform to land use guidance from Shannon Airport.		
East Clare Loughlands	Medium to high	Small	The enclosed drumlin landscape offers some capacity for wind farms though the small scale of the landscape would support small wind farms only.		
Tulla Drumlin Farmland	Medium	Small or medium	The landform offers capacity to accommodate wind farms that reflect the small to medium scale of the area		
Ennis Drumlin Farmland	High	Small	Due to its status as County town and the key communication routes, this area has a significant residential population. Wind farm developments should be limited in height to avoid overpowering existing buildings close to urban centres. The more rural areas could accommodate small wind farms.		
Fergus Estuary	High	Small	The ecological sensitivities and the low-lying expansive landscape increase the overall sensitivity of this LCA. Large developments would have considerable impact. Small developments could be accommodated if carefully sited away from the estuary shore and adjoining lands.		
Cullenagh River Farmlands	Medium	Small	The landform offers some capacity to accommodate small wind farms that reflect the small scale of the area. Sites away from the river valley itself would be preferable using the drumlins as screening to avoid dominating the area.		
Sliabh Aughties	High	Medium	The key sensitivities for this LCA concern its designation as a SPA and also the cumulative impacts of wind energy developments in this area, including the neighbouring county of Galway. NPWS expressed concern about the cumulative impacts of wind energy developments within this area. However from a landscape perspective there is some capacity to accommodate wind energy developments.		
Malbay	High	Small	The open exposed character of this area and its significance as a tourism and recreational area increases the overall sensitivity. Large or medium wind farms would be highly visible particularly close to the coastal area. There may be some limited capacity to accommodate small wind farms further east where the landform is more undulating.		

LCA's within areas designated as Not Normally Permissible

LCA	Overall Sensitivity to Wind Farm Developments	Appropriate size of wind farms (turbine numbers)	Capacity	LCTs in Co. Clare. LCA and Corresponding LCTs in 2006 Planning Guidelines	Cumulative Advice from 2006 Planning Guidelines
Burren Uplands	High		This LCA is internationally known for its ecology, archaeology and geology and is currently being considered as an UNESCO Geopark and is on the tentative list for World Heritage Site status. All of these designations combined with its significant tourism and recreational resources create an area highly sensitive to wind farm development. There is no capacity in this area for wind farm development at commercial or community level.		
Low Burren	High		This LCA is internationally known for its ecology, archaeology and geology and is currently being considered as an UNESCO Geopark and is on the tentative list for World Heritage Site status. In addition, part of the National Park is located within this LCA. All of these designations combined with its significant tourism and recreational resources create an area highly sensitive to wind farm development. There is no capacity in this area for wind farm development at commercial or community level.		
Cliffs of Moher and Lahinch	High		Upland areas away from the tourism and recreational areas may support small wind farm developments of up to 5 turbines. The exposed nature of the area would require careful siting. Cumulatively no more than one wind farm development. Note: the eastern part of this area has some limited capacity for wind energy development and is included in the Open for Consideration Category. However the coastal parts of this LCA are highly sensitive to such development.		
Fergus Loughlands	High		The significant ecological and archaeological resources in this LCA increases the overall sensitivity of the area and its location as a gateway into the wider Burren Area also reduces the capacity of this LCA to successfully accommodate wind energy developments		
Lough Graney	High		This LCA is highly attractive and a good example of a working agricultural landscape. Its situation within the wider Sliabh Aughties creates a tranquil and intimate landscape orientated around the Lough and the foothills. Any tall developments within this LCA would have a profound impact and would detract considerably from the character of the landscape.		



5

Glossary



A

Alternatives

Description of alternative locations, alternative designs and alternative processes.

Anemometer

Equipment fixed on a mast to measure wind speed over a particular site. Anemometry masts are usually slender structures fixed to the ground with guy wires.

Ambient Noise

The average noise level over a given period of time usually composed of sound from many sources, near and far.

Appropriate Assessment

An assessment of the effects of a plan or project on the Natura 2000 network. The Natura 2000 network comprises Special Protection Areas under the Birds Directive, Special Areas of Conservation under the Habitats Directive and Ramsar sites designated under the Ramsar Convention (collectively referred to as European sites)

B

Background Noise Level

A measurement of the noise level already present within the environment in the absence of wind energy development operation.

Baseline Survey:

Description of the existing environment against which future changes can be measured.

Berm

An extended mound of soils, overburden or structure erected as a barrier to sight, sound or water.

Blade Swish

The modulation of broadband noise at blade passing frequency.

Borrow Pit

An area of excavation of rock and/or soil material that is used elsewhere within the site development boundaries.

Built Environment

Refers to both architectural heritage and archaeological heritage.

C

Commissioning

The making fully operational of a project.

Cut-in Wind Speed

The wind speed at which a turbine produces a net power output. This is usually at hub height wind speeds of 4-5 metres per second.

Cumulative Effects

Effects on the environment that result from incremental changes caused by the strategic action together with other past, present, and reasonably foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over time or space

D

Digital Elevation Model (DEM)

The analysis uses the elevation value of each cell of the DEM to determine visibility to or from a particular cell. The location of this particular cell varies depending on the needs of the analysis. In this case, several points around the summits of the above areas were used to represent the highest points in those areas. The viewshed analysis was calculated to determine where in the remainder of the county, these points can be seen by an observer (approximately 2m in height). No additional height (i.e. turbine height) was added.

E

Ecology

The study of relationships between living organisms and between organisms and their environment (especially animal and plant communities), their energy flows and their interactions with their surroundings.

EIA - Environmental Impact Assessment

An ordered exercise designed to enable the environmental impacts of a proposed development/project to be anticipated before the project is carried out.

EIS - Environmental Impact Statement

A statement of results from the EIA which focuses on anticipating all environmental impacts of significance of a proposed development, prior to implementation or construction, and which specifies those measures which should be taken to eliminate or mitigate such impacts to an acceptable level.

European Site

Designated European sites, also known as *Natura 2000 Sites* include *Special Areas of Conservation* (SAC), candidate Special Areas of Conservation (cSAC), under Habitats Directive 1992 and *Special Protection Areas* (SPA's) under Birds Directive 1985.

G

Gate 3

Since December 2004 large scale commercial renewable generators (i.e. > 0.5 MW) wishing to connect to the transmission or distribution systems have been subject to group processing of connection applications through a series of successive "Gates". Renewable generator applications are processed in a "Gate" system whereby all applications that have met the defined criteria are processed in one batch (source: Irish Wind Energy Association).

Generation

Electricity generation is the process of creating electricity from other forms of energy. For the purposes of this strategy, the term “generation” is defined as *generation for storage and transmission of electricity*.

Geology

Science of the earth, including the composition, structure and origin of its rocks.

Geographical Information System (GIS)

is a computer system that collects, stores, views and analyses geographical information and commonly creates maps as an output

H

Habitat

Area in which an organism or group of organisms live.

Hub height

Height of wind turbine tower from the ground to the centre-line of the turbine rotor.

Hydrology

Science concerned with the occurrence and circulation of water in all its phases and modes.

M

Mitigate

to make or become less severe or harsh.

Monitoring

Repetitive and continued observation, measurement and evaluation of environmental data to follow changes over a period of time, to assess the efficiency of control measures.

N

Natura 2000 Site

Designated *European Site*. In combination *Special Areas of Conservation* and *Special Protection Areas* will constitute the Natura 2000 network of protected sites for habitats and species across the EU.

Natural heritage

Refers to habitats and species of flora and fauna.

Noise

Any sound that has the potential to cause disturbance, discomfort or psychological stress to a subject exposed to it. Described as “unwanted sound”.

Noise Sensitive Location

In the case of wind energy development, this includes any occupied dwelling house, hostel, health building or place of worship and may include areas of particular scenic quality or special recreational amenity importance.

S

SAC – Special Area of Conservation

These are prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level. Most Special Areas of Conservation (SACs) are in the countryside, although a few sites reach into town or city landscapes.. Conservation Management Plans are available for many SACs and as additional ones are approved they will be posted.

The legal basis on which SACs are selected and designated is the EU Habitats Directive, transposed into Irish law in the European Union (Natural Habitats) Regulations 1997 as amended in 1998 and 2005. The Directive lists certain habitats and species that must be protected within SACs.

SEA - Strategic Environmental Assessment

The objective of the SEA Directive 2001/42/EC is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment

Sensitivity

Potential for significant change to any element in the environment that is subject to impacts.

Shadow Flicker

Term used to describe the short-lived effect of shadows cast by rotating blades of wind turbines when the sun passes behind them, which occurs under certain combinations of geographical positions and time of day.

SPA - Special Protection Area

Special Protection Area under Birds Directive (79/409/EEC), designated for bird species listed in Annex I of the Directive, in particular internationally important concentrations of migratory and wetland birds. Designation is focused on habitats of these species.

Substation

Connects the local electricity network to the electrical system of the wind energy project through a series of automatic safety switches.

T

Threshold

Magnitude of a project, which if exceeded, will trigger the requirement for an Environmental Impact Assessment.

Acronyms

LCA – Landscape Character Area

Landscape character areas are units of the landscape that are geographically specific and have their own character and sense of place. Each LCA has its own distinctive character, based upon patterns of geology, landform, land use, cultural, historical, and ecological features. Commonly, a landscape character area may be composed of a number of landscape character types. For example, the Lough Graney LCA is composed of three LCTs – Forested upland valleys, loughside farmland and glacial valley. However, the settlement patterns, historical and cultural associations of this area contribute to the distinctive character of this LCA.

ACA – Architectural Conservation Area

ACA's are areas designated to preserve the character of places and townscapes which are of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest or that contribute to the appreciation of protected structures.

NHA – Natural Heritage Area

Natural Heritage area is the basic designation for wildlife at a national level. This is an area considered important for the habitat present or which has species, plants or animals whose habitat needs protection.

LCT – Landscape Character Type

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 the country. Nonetheless, where they do occur, they commonly share similar combinations of geology, topography, land cover, and historical land use. For example, limestone river valleys or blanket bog uplands are distinct landscape character types and are recognisable as such whether they occur in County Clare or other counties.

6

Annex A: Best Practice and General Considerations for wind energy developments in County Clare



6.1 General Considerations for Applications for Wind Energy Development

- Clare County Council will require compliance with the *Wind Energy Development Guidelines, Guidelines for Planning Authorities* (DEHLG, 2006) in preparing planning applications.
- Early and meaningful consultation with Clare County Council and statutory agencies will assist in identifying environmental sensitivities and considerations during the preparation of a planning application.
- The current requirement for Environmental Impact Assessment for wind energy developments is for 5 turbines of 5MW or more. The Council may require the preparation of an Environmental Impact Assessment for sub threshold development.
- All wind energy developments, including those sub threshold for EIA may require Habitats Directive Assessment screening under Article 6 of the Habitats Directive.
- All wind energy developments should prepare an environmental constraints map to identify the most and least sensitive environmental resources on the site. This constraints map will assist in informing the size, layout and design of the wind energy development.
- An Ecological Impact Assessment may also be required as appropriate.

- The Council may require as appropriate, the preparation and implementation of an Environmental Management Plan (incorporating surface water, groundwater protection, slope stability, flood risk potential, waste generation and management and ecology and protection of natural heritage) for wind energy developments.
- The following NHA's are included fully or partly in the 'Acceptable in Principle' areas, and developments proposed for these sites will be subject to detailed hydrological and ecological assessment to ensure their integrity is not significantly compromised by wind energy development.

Slieve Callan AIP

- 002367 - Lough Naminna Bog NHA
- 002397 - Slievacallan Mountain Bog NHA
- 002400 - Cragnashingaun Bogs NHA
- 002421 - Lough Acrow Bogs NHA

Broadford Hills AIP

- 002401 - Gortacullin Bog NHA
- 002402 - Woodcock Hill Bog NHA.

Guidelines of relevance include:

- *Wind Energy Development Guidelines, Guidelines for Planning Authorities* (DoEHLG, 2006).
- *Guidelines on Information to be contained in Environmental Impact Statements* (EPA, 2002).
- *Advice Notes on Current Practice in the preparation of Environmental Impact Statements* (EPA, 2003).
- *Environmental Impact Assessment (EIA) Guidance for consent Authorities regarding sub-threshold development* (DoEHLG, 2003).
- *Best Practice Guidelines for Wind Farm Development* (IWEA and SEI, 2008).
- *Forestry and Freshwater Pearl Mussel Requirements Site Assessment and Mitigation Measures* (Forest Service, 2008)
- *Landslides in Ireland. Irish Landslides Working Group* (GSI, 2006).

- *General scoping from the National Parks & Wildlife Service in relation to Wind Farm Development and appropriate Environmental Impact Assessment (EIA)* (NPWS, 2008).
- *Wetlands Conservation and Protection in EPA Code of Practice: Environmental Risk Assessment for Waste Sites* (EPA, 2007).
- *DOEHLG circular letter – SEA 1/08 & NPWS 1/08* (dated 15/02/08).
- *Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* (NRA, 2007).
- *Policy Statement on Development Management and Access to National Roads, National Roads Authority* (NRA, 2006).
- *The Planning System and Flood Risk Management & Technical Appendices - Guidelines for Planning Authorities* (DoEHLG, Nov '09).
- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (DoEHLG, Dec. '09).

The development of specific measures for environmental parameters discussed in the following section is a consequence of the SEA and HDA process informing the Wind Energy Strategy. These measures seek to address significant environmental impacts associated with wind energy development at strategic and project level. There is a clear commitment by Clare County Council to ensure the implementation of these measures to facilitate proper planning and demonstrate best practice in planning for wind energy developments in the County.

6.2 Biodiversity, Flora and Fauna Birds

- Construction works should be timed and designed so as not to disturb breeding birds and site specific advice should be sought from a qualified and experienced ecologist.
- Yearly monitoring of wind farm developments associated with wind energy areas identified in the Strategy should be undertaken by professional ecologists and funded by the relevant wind energy developer. The methodology, responsibility and rationale for this approach should be clearly outlined by the NPWS to assist developers.
- Where nesting hen harriers or merlins are recorded within close proximity to turbines, appropriate mitigation measures may be required to avoid any potential risks to displaying birds and newly fledged birds. Advice should be sought from a qualified and experienced ecologist.
- Any proposed wind energy developments within the Wind Energy Area adjacent to the Lower River Shannon SPA will require, subject to consultation with Clare County Council, a Habitats Directive Assessment. Such assessments will need to consider the cumulative impacts of wind energy developments with the conservation objectives of the relevant site. Wind farm developments occurring within or adjacent to this Natura 2000 site will only be considered where it can be shown, following a Habitats Directive Assessment, that the development, in combination with other plans or projects, will not have an adverse effect on the conservation management objectives of this site.

Bats

- A number of measures have been identified to ensure that any remaining adverse impacts to lesser horseshoe bats are avoided and mitigated. These measures are listed below.
- Construction works should be timed and designed so as not to disturb breeding bats.
- Buffer zones will be established in areas identified as lesser horseshoe foraging habitats. These buffer zones will adhere to current guidance with regard to avoiding and or minimising impacts to this species and will be implemented in consultation with relevant authorities.

Peat

- Where construction works are taking place in hydrologically sensitive habitats, works will be confined to the smallest possible area. Minimum removal of vegetation will take place so as to reduce areas of bare peat or soil. When excavations are being undertaken surface vegetation will be removed in sods that can be stored and later replaced around structures where bare peat/soil exists. This will ensure a more rapid re-vegetation of bare peat/soils and will help to reduce potential soil erosion that could lead to water pollution.
- The careful siting of tracks, construction compounds, cable trenches etc. will be carried out so that areas of deep/wet peat are avoided. Where deep/wet peat cannot be avoided floating roads will be used to reduce the adverse effects associated with the construction and operation of such structures.

- During construction works, the enforcement of standard pollution control measures will be undertaken to prevent potential polluting substances from entering drains and having the potential to affect water quality further downstream from wind farm areas.
- The indirect impact of construction on peat habitats is generally far greater than immediate footprint due to impacts on hydrology. Environmental Impact Assessments undertaken on Peatland habitats affected by wind farm development should estimate 'permanent loss; due to direct and indirect effects.

Buffer Zones

- Buffer zones will be established for wind energy developments close to Natura 2000 sites in the County. The extent of the buffer zones will be dependant on the habitat type and species present. Buffer zones should be developed at the pre-planning stage of wind energy project in consultation with Clare County Council, National Parks and Wildlife Service and the Department of Environment, Heritage and Local Government and where fisheries protection is concerned, the Shannon Regional Fisheries Board.
- Where a development is proposed close to a Natura 2000 site, the applicant should determine, in consultation with the Clare County Council, if a Habitats Directive Assessment is required.
- Where a development is proposed close to or within a Natural Heritage Area, further ecological or geological surveys must be undertaken by suitably qualified ecologists or geologists. All wind energy developments must be subject to Habitat Mapping by appropriated qualified and experienced ecologists.

Habitat Restoration

- A habitat restoration and management plan should be developed as part of the EIS to address reinstatement of mineral and peat soils and allow for positive ecological impacts associated with the development. Such plans should be developed in consultation with Clare County Council.

Biodiversity

- The protection of non-designated habitats, species and local biodiversity features should be promoted through site design and landscape management plans.
- Habitat mapping (including wetlands) and ecological impact assessment may be required for wind energy applications. This habitat mapping should be undertaken at an appropriate scale and in accordance with agreed national Habitat Mapping Methodology. The habitat map should be overlaid with the emerging development to highlight sensitive habitats and help assess potential impacts. The applicant must consult with Clare County Council and NPWS in this regard.

Invasive Species

- The implementation of measures to control and manage alien and invasive species such as Japanese Knotweed and noxious weeds such as Ragwort may be required as part of the Environmental Management Plan. In particular, attention should be paid to the potential for construction activities to introduce such species to an area.

Forestry and Clearfelling

- Development proposals should have regard for the *Forest Service Policy on Felling Licenses for Wind Farm Development* (Department of Agriculture, Fisheries and Food, Oct. 2009). Consideration should also be given to the ecological impacts of replacement planting in other areas that may be required when clearfelling grant aided forestry.

6.3 Water

- The applicant shall have regard to the relevant objectives and measures set out in the Shannon International River Basin District River Basin Management Plan and associated Programme of Measures. In particular, works relating to construction and maintenance of wind energy developments should aim to prevent the deterioration and maintain high or good status for surface waters, and limit pollution inputs and prevent deterioration of groundwater.
- The relevant measures relating to the Shannon and Cloon Rivers (including Cloon River Sub Catchments Management Plan) are of particular importance in relation to the Shannon International River Basin District River Basin Management Plan.
- To avoid surface water pollution during construction works, the enforcement of standard pollution control measures will be undertaken to prevent potential polluting substances from entering drains and having the potential to affect water quality further downstream from wind farm areas.
- Where construction and maintenance of wind energy developments are proposed close to coastal and estuarine areas, adequate measures for the protection of fisheries/ shellfisheries should be developed as part of the Environmental Management Plan
- Where construction and maintenance of wind energy developments are proposed close to designated salmonid fisheries and or freshwater pearl Mussel rivers (Cloon River and subcatchment), adequate measures for the protection of same will be required as part of the Environmental Management Plan.
- Particular care and management is required in relation to peat extraction and storage. Best practice in construction and management is required for peat areas.
- Hydrogeological impacts must be carefully assessed particularly in relation to peat soils. Consultation with the GSI is recommended in relation to modelling. Such modelling must be agreed with the GSI and undertaken by competent and qualified geotechnical persons.
- A buffer zone along water features such as rivers and lakes may be required. These buffer zones represent a corridor for the protection of water quality and habitats. The extent of the buffer zone is site dependant and should be developed in conjunction with Clare County Council.
- The potential for the release of phosphorus during clearfelling and impacts on water quality should be carefully assessed and appropriate construction management practices adhered to.
- Environmental Impact Statements should address the synergistic relationships between water quality, biodiversity, soil function and ecology.

6.4 Soil and Geology

- Where construction works are taking place in hydrologically sensitive habitats works should be confined to the smallest possible area. Minimum removal of vegetation should take place so as to reduce areas of bare peat or soil. When excavations are being undertaken, surface vegetation will be removed in sods that can be stored and later replaced around structures where bare peat/soil exists. This will ensure a more rapid re-vegetation of bare peat/soils and will help to reduce potential soil erosion that could lead to water pollution.
- Consideration should be given to calculating the carbon output of constructing wind energy developments on peatlands.
- Landslide susceptibility and risk assessment must be undertaken for all proposed developments particularly in peat areas to ensure all factors contributing to slope instability are identified and addressed appropriately. This assessment should incorporate slope stability mapping and groundcover assessment in the context of potential cumulative effects arising from multiple developments. Consultation with the Geological Survey of Ireland (GSI) is required to undertake best practice landslide susceptibility modelling. Please refer to the following report, *Landslides in Ireland* (GSI, 2006).

- The potential impacts on slope stability relating to climate change impacts, most particularly flash floods and changing weather patterns should be considered if possible and adaptation measures should be developed to account for same. Regard shall be given to *The Planning System and Flood Risk Management & Technical Appendices - Guidelines for Planning Authorities* (DoEHLG, Nov 2009), as these also address climate change impacts.
- Construction management plans developed as part of the planning application should address quarrying, borrow pits, soil management including storage, and opportunities for soil reinstatement.

6.5 Landscape

- The DoEHLG publication *Wind Energy Development Guidelines, Guidelines for Planning Authorities* (page 15) states the following:
 - *“The visibility of a proposed wind energy development from designated views or prospects would not automatically preclude an area from future wind energy development but the inclusion of such objectives in a development plan is a material factor that will be taken into consideration in the assessment of a planning application”.*
- The Clare County Development Plan 2011-2017 identifies the following landscape types within the County:
 - 1 Settled landscapes** – where people live and work
 - 2 Working Landscapes** – intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource. The Plan identifies two in the County i) Western Corridor Working Landscape ii) The Shannon Estuary Working Landscape.
 - 3 Heritage Landscapes** – where natural and cultural heritage are given priority but where development is not precluded rather things must happen more slowly and carefully. The Plan identifies 4 Heritage Landscapes i) Lough Derg and the Eastern Uplands ii) The Burren iii) The Fergus/Shannon Estuary iv) The Coast.
- The above designations are identified in Volume 2, Map B of the Clare County Development Plan 2011-2017, and Chapter 16 (Landscape Character and Amenities) of the Plan, sets out the objectives with regard to their management.
- Such designations and the associated objectives contained in Chapter 16 of the Plan will be considered by the Council and balanced with the strategic importance of achieving targets in the *National Climate Change Strategy 2007-2012* (DoEHLG, 2007) and renewable energy targets.
- Clare County Council will accommodate wind energy developments in areas identified as ‘Strategic’ or ‘Acceptable In Principle’ subject to implementation of best practice in siting and design.

- Wind energy developers should have regard to the *Wind Energy Development Guidelines, Guidelines for Planning Authorities* (DoEHLG, 2006). Future applications should demonstrate that due regard has been given to the advise and details outlined in these Guidelines. Applications should be accompanied by a Landscape Impact Assessment Report. The Landscape Impact Assessment Report should include the following:
 - › Description of proposed development, including alternatives considered during design process
 - › Description of geographic location and landscape context
 - › Definition of study area, informed by identifying the Zone of Theoretical Influence
 - › General landscape description of the study area
 - › Selection of viewshed reference points from where the proposal is examined in detail
 - › Assess the sensitivity of landscape from each viewshed reference point
 - › Preparation of photomontages
 - › Estimation of likely degree of impact on landscape
 - › Recommendation of mitigation measures
 - › A landscaping plan should be submitted as part of the application
 - › The visual linkages between established landmarks, landscape features and views should be considered as part of the landscape and visual impact assessment.
 - › Regard must also be given to potential negative landscape impacts in adjoining counties, and the Planning Authority may request that visual impact assessments address this issue. In particular, designated scenic landscapes, views, routes and features of county, regional and local value should be considered and assessed for visual impacts.

- › Should specific recommendations arise from the proposed National Landscape Strategy and National Landscape Characterisation, any future applications must take such guidance in to consideration.

6.6 Cultural Heritage Archaeology

- All planning applications within 30 metres from a listed archaeological site, on the Record of Monuments and Places must be accompanied by an archaeological assessment detailing the impacts which the proposed development would have on archaeology in the area.
- A registered archaeologist should be present during the initial stripping of the topsoil at permitted development sites, within 30 metres of a listed archaeological site.

Architectural Heritage

- Some applications may be required to undertake an assessment of the impacts of a proposed development on the architectural character, particularly in towns or settlements with a rich architectural heritage, reflected in their designation as ACAs. This will also apply to protected structures.
- Assessments should be undertaken by a conservation architect and it is advised that at preplanning stage, the Planning Authority should be contacted to determine if there is a need for such an assessment.

6.7 Population and Human Health

- Applications must have regard to the thresholds, limits and buffer zone in the Planning Guidelines for Wind Energy Development for Planning Authorities 2006 in order to mitigate against potential impacts on human health in terms of shadow flicker, visual impact and noise.
- A construction management plan must accompany the EIS which will outline the measures taken to avoid dust impacts and negative impacts from construction traffic.

6.8 Air and Climate

- Where developments are proposed on peat soils, carbon sinks and outputs associated with the development should be calculated. Reference is also made to discussion on wind energy construction on peat bogs and the Bogland project funded by the EPA. *'Peatland vulnerability to energy-related developments from climate change policy in Ireland: the case of wind farms.* (F. Renou-Wilson and C.A. Farrell Mires and Peat, Volume 4 (2008/9), Article 08, <http://www.mires-and-peat.net/>).
- It is recognised that forestry clearance may be necessary in certain sites to facilitate wind energy developments. Consideration should be given to carbon loss from this clearance and alternative approaches such as 'key holing' combined with replacing felled trees with short rotation coppice/low height native woodland or short rotation forestry. Such replacement could be considered as part of the landscaping plan for a wind energy development.

6.9 Material assets – transport, waste management, energy use and noise

- Traffic management plans should be submitted with applications to address impacts on residents in relation to construction activities.
- Where the construction of new roads is required to construct/service wind energy developments, adequate and appropriate drainage measures will be required. The careful siting of tracks, construction compounds, cable trenches etc. should be carried out so that areas of deep/wet peat are avoided. Where deep/wet peat cannot be avoided floating roads will be used to reduce the adverse effects associated with the construction and operation of such structures. EPA guidance in relation to floating roads should also be consulted.
- The carrying capacity, operational efficiency, safety and national investments in national roads should be protected in relation to the implementation of wind energy strategy and Traffic Impact Assessments may be required to demonstrate same.
- There will be a clear presumption in favour of protection of the national road network and direct access onto national roads outside a 50kph speed limit applies will be restricted.

- Waste management plans should be submitted with applications to address waste management impacts. In addition, please refer to Best Practice Guidelines in Reuse and Recycling of Construction and Demolition Waste (DoEHLG, June 2006). Waste management plans should be in compliance with county policies on construction waste management.
- In relation to noise, please address noise assessment, mitigation and thresholds stated in the Planning Guidelines for Wind Energy Development for Planning Authorities 2006 Noise impact assessments may also be required for construction activities as part of the EIA.
- During the construction phase of works, regard should be given to the Noise Directive and associated national noise regulations and any relevant actions/measures identified in a proposed Noise Action Plan for County Clare when available.

6.10 Aviation Safety and Navigation

- Applicants are advised to consult with the Irish Aviation Authority in relation to interference with airport navigational aids.

6.11 Cumulative Impacts of Wind farms

- The cumulative impact of wind farms throughout the County and in particular, in areas identified as 'Acceptable in Principle', has been considered. The key focus is on how many developments may be acceptable, where are the best locations and what scale and design is most fitting.

- In areas identified as 'Strategic or 'Acceptable in Principle', baseline fieldwork assessed the capacity of these areas to accommodate wind farm development and all were considered to have capacity for medium wind farm developments. This will be monitored over the lifetime of the Strategy as further development and environmental information becomes available.

6.12 Strategic Environmental Assessment Monitoring Programme for the implementation of the Wind Energy Strategy

- It is proposed that the SEA monitoring reporting should take place in parallel with the reviewing of the strategy. However, in some cases as data becomes available, the Planning Authority may prepare an additional SEA Monitoring Report, if it is deemed necessary, particularly if the new data and its spatial analysis identifies negative impact(s) on the environment.
- Should the monitoring regime identify significant impacts (such as impacts on designated sites) early on in the Wind Energy Strategy implementation, this should trigger a review of the Wind Energy Strategy and monitoring regime. It is recommended that data arising from planning applications, particularly in terms of environmental constraints mapping and Environmental Impact Statements be integrated into the GIS and monitoring system.

6.13 Land use in ‘Strategic’ and ‘Acceptable in Principle Areas’

- This section presents a brief environmental profile of the ‘Strategic’ and ‘Acceptable in Principle’ areas as proposed in the Wind Energy Strategy. The data is derived from the Corine 2006 dataset and provides information on landcover in these areas. Please note that whilst it is a useful indication of landcover, it is general in scope as it maps units at 25 hectares. Percentages have been rounded up, whilst Figure A1 below indicates these areas in the County.

Table Annex A: Percentage Landcover in Strategic and Acceptable in Principle Areas from Corine 2006 data.

Doonbeg Area	% cover
Pasture	43.0
LPOA with SANV	0.0
Transitional Woodland	6.8
Peatbog	88.0

Doonbeg/Kilrush	% cover
Pasture	7.9
LPOA with SANV	13.3
Transitional Woodland	12.8
Peatbog	65.9

Knockmore/Kilnamona	% cover
Non-irrigated arable land	1.2
Pasture	54.9
LPOA with SANV	10.2
Conifer Forest	8.4
Transitional Woodland	18.9
Peatbog	6.2

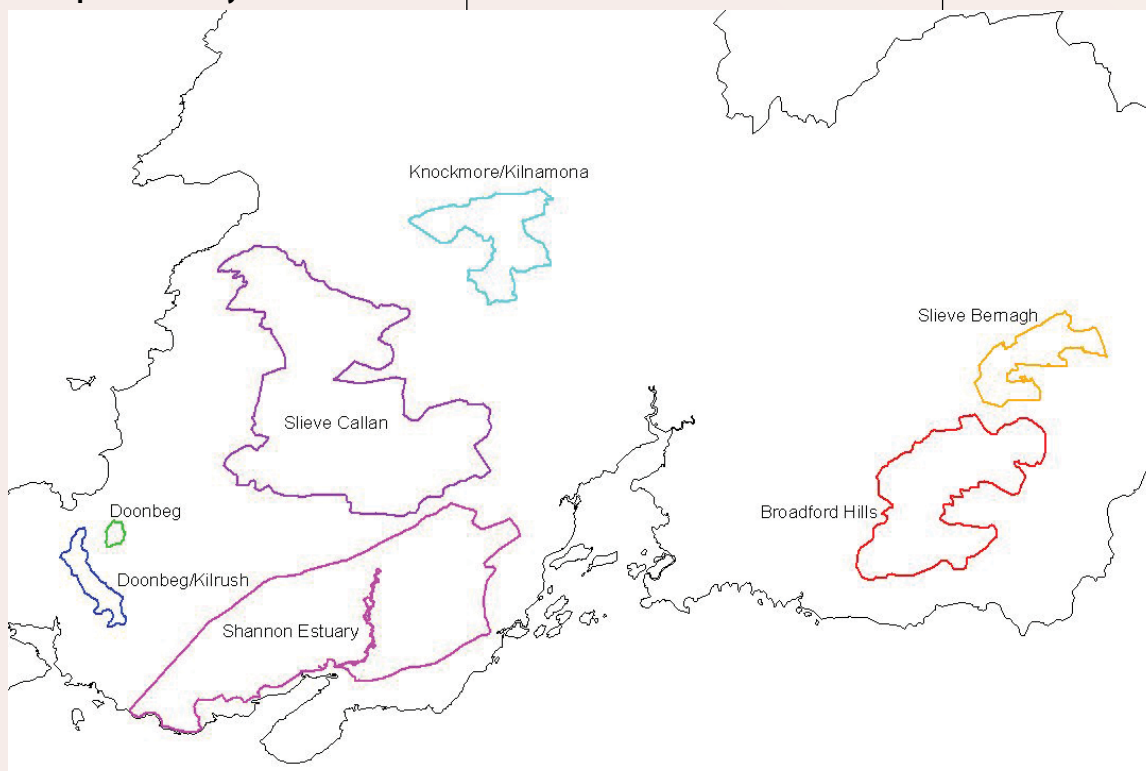
Sliabh Bernagh	% cover
Pasture	16.2
Complex cultivation patterns	0.7
LPOA with SANV	10.7
Conifer Forest	31.7
Mixed Forest	1
Natural Grassland	0.1
Moor and Heathland	4.2
Transitional Woodland	29.3
Peatbog	6

Slieve Callan	% cover
Non-irrigated arable land	1.3
Pasture	18.8
Complex cultivation patterns	0.7
LPOA with SANV	12.0
Conifer Forest	10.8
Natural Grassland	0.2
Transitional Woodland	30.0
Peatbog	25.5
Water Bodies	1

Broadford Hills	% cover
Mineral extraction site	0.4
Non-irrigated arable land	1.6
Pasture	42.5
Complex cultivation patterns	0.1
LPOA with SANV	4.1
Broadleaf forest	0
Conifer Forest	8.7
Transitional Woodland	28.2
Peatbog	14.3

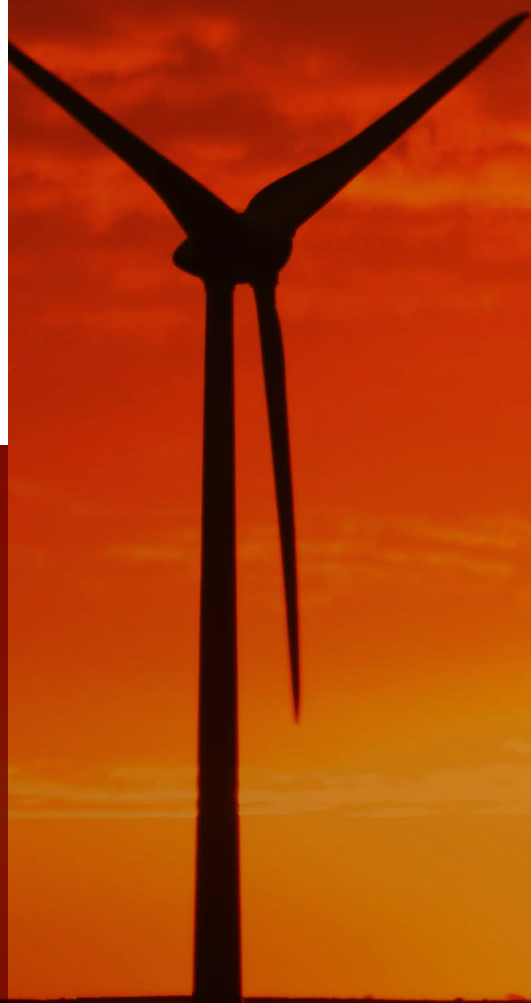
Land Principally Occupied by Agriculture (LPOA) with Significant Areas of Natural Vegetation (SANV).

Figure A1: Indicative areas identified as ‘Strategic’ and/or ‘Acceptable in Principle’ in County Clare.



7

Annex B: LCA Forms



C1.1

LCA's within Strategic Areas

L.C.A. Sliabh Callan

This LCA encompasses upland hills and slopes of Sliabh Callan and Ben Dash

Key Landscape and Visual Characteristics and Values

Scale: Medium to large

Landform: Upland area of hills and plateaux broad valleys in between.

Landcover: Mix of pasture with increased forestry on upper soils.

Enclosure: Upper slopes more open with increased enclosure though hedgerows on lower slopes.

Human influence: Agricultural activity, afforestation, scattered settlement.

Landscape Quality: Good to moderate

Wildness and Tranquillity: Increasingly remote further north.

Natural and Cultural Heritage Features: NHA designation at Sliabh Callan.

Amenity and Recreation: Limited facilities.

Sensitivity to Wind Energy Development

Overall Sensitivity:

Very large/large wind farm:

Medium wind farm:

Small wind farm:

Capacity Assessment: The rolling hills, low settlement, extensive plantations reduce the overall sensitivity of this LCA to Wind farm development. The area could accommodate large or medium wind farms subject to careful siting to avoid significant impacts on skylines.

Potential Energy for this Area is 250 MW (Limerick Clare Energy Agency - LCEA)

L.C.A. Sliabh Bernagh Uplands

This LCA encompasses the Sliabh Bernagh Range and Broadford Hills.

Key Landscape and Visual Characteristics and Values

Scale: Medium to large

Landform: Rolling hills and drumlins

Landcover : Varies with elevation with extensive coniferous plantations on upper slopes and more active agricultural activities on lower slopes.

Enclosure: Hedgerows and drumlins create some enclosure whilst large plantations afford some screening in certain upland parts.

Human Influence: Scattered settlement, large plantations, and agricultural activities.

Landscape Quality: Moderate to good

Wildness and Tranquillity: Increased in upland areas.

Natural and Cultural Heritage Features: Ritual features such as megalithic tombs, provides backdrop to Lough Derg and environs. Sliabh Bernagh cSAC.

Amenity and Recreation: East Clare Way and recreational activities orientated around eastern slopes overlooking Lough Derg

Sensitivity to Wind Energy Development

Overall Sensitivity: Medium

Very large/large wind farm: Medium to low

Medium wind farm: Low

Small wind farm: Low

Capacity Assessment: There are certain parts of this LCA that are highly sensitive due to their nature designations and scenic qualities. In particular, the foothills and mountains overlooking Lough Derg and the unenclosed bogs of Lackragh and Glenvagalliagh Mountain.

However, other areas on the north west and westerly aspects of the mountain are more robust and can accommodate large or medium wind farms.

In the Broadford Hills areas, the areas around Woodcock Hill, Ballycar, Corlea and Knockaunnamoughily are identified as Strategic Areas.

Potential Wind Energy from this site is 150 MW (LCEA)

C1.2

LCA's within Acceptable in Principle Areas

Landscape Character Area Kilnamona High Drumlin Farmland	
Key Landscape and Visual Characteristics and Values	Sensitivity to Wind Energy Development
<p>Scale: Medium to small</p> <p>Landform: Dominated by high drumlins.</p> <p>Landcover: Mix of pasture, coniferous plantations and boggy areas.</p> <p>Enclosure: Hedgerows on lower slopes and topography creates some enclosure</p> <p>Human Influence: Agricultural activity and scattered settlement</p> <p>Landscape Quality: Variable</p> <p>Wildness and Tranquillity: Not strongly characteristic of this LCA</p> <p>Natural and Cultural Heritage Features: Few designations but line of holy wells south of Dysert O'Dea.</p> <p>Amenity and Recreation: Limited amenity and recreational facilities</p>	<p>Overall Sensitivity: Medium to low</p> <p>Very large/large wind farm: Medium</p> <p>Medium wind farm: Low</p> <p>Small wind farm: Low</p>
<p>Capacity Assessment: This area has some capacity for wind farm development owing to the topography, declining agricultural activity and dispersed settlement. Large or medium wind energy developments could be accommodated in this area.</p>	

Landscape Character Area Shannon Estuary	
Key Landscape and Visual Characteristics and Values	Sensitivity to Wind Energy Development
<p>Scale: Medium</p> <p>Landform: Prominent ridges and linear hills becoming increasingly flat towards Estuary and Kilrush</p> <p>Landcover: Mix of pasture, wood, scrub and estuarine habitats</p> <p>Enclosure: Varies, screening afforded by hills but long views from elevated areas.</p> <p>Human Influence: Promontory forts and human use of estuary resources, agricultural and industrial activities.</p> <p>Landscape Quality: Variable.</p> <p>Wildness and Tranquillity: Close to estuary tranquil and quite remote. More active landscape around Moneypoint and N68</p> <p>Natural and Cultural Heritage Features: SAC designations such as Scatterry Island and Clonderlaw Bay. Designed landscapes around estuary and Scatterry Island monastery</p> <p>Amenity and Recreation: Orientated around Kilrush</p>	<p>Overall Sensitivity: Medium to low</p> <p>Very large/large wind farm: Medium</p> <p>Medium wind farm: Low</p> <p>Small wind farm: Low</p>
<p>Capacity Assessment: This LCA has some capacity for large to small wind farms in part due to the quite industrial nature of the area close to Moneypoint and the capacity of the ridged hills to accommodate wind energy developments.</p>	

C1.3

Open for Consideration Areas

Landscape Character Area River Shannon Farmlands Please note wind speeds are not viable at 75m modelling for this area. At 100m, upper wind speeds are approximately 7.75 m/s/	
Key Landscape and Visual Characteristics and Values Scale: Medium to small Landform: Low lying gently undulating landform influenced by River Shannon with uplands of Sliabh Bernagh and Broadford Hills in distance. Enclosure: Some enclosure from woodland and hedgerows. Complexity of landcover and features: Principally pasture with pockets of peat, small pockets of commercial forestry with River Shannon. Man-made influence: Agricultural activities and headrace for Ardnacrusha, former estates and archaeological resources. Landscape quality (condition): Largely intact and good quality with increasing urban influence of Limerick City apparent in the south. Wildness and tranquillity: Not strongly wild or tranquil Natural and cultural heritage features: River Shannon is designated. Cultural Heritage associated with Killaloe and other settlements. Amenity and recreation: Tourism and recreation centred round the northern part of LCA at Killaloe and environs.	Sensitivity to Wind Energy Development Overall Sensitivity: Medium Very large/large wind farm: High Medium wind farm: Medium Small wind farm: Low
Capacity Assessment: There is some capacity in the southern part of this LCA for development away from Lough Derg and Killaloe. Due to the low lying nature of the LCA turbine heights of the lower heights would be most appropriate.	
Landscape Character Area Sixmilebridge Farmlands Please note wind speeds are not viable at 75m modelling for this area. At 100m, upper wind speeds are approximately 7.75 m/s/	
Key Landscape and Visual Characteristics and Values Scale: Medium Landform: Gently undulating, becoming flatter and more estuarine towards the Shannon Estuary. Enclosure: Varies with greater enclosure north of the N18 with undulating landform, hedgerows and mature trees. More exposed toward the estuary. Complexity of landcover and features: Principally agricultural with important communication routes of N18 and Shannon Airport and town. Man-made influence: Visible through roads, settlement, archaeology, airport. Landscape quality (condition): Generally well maintained. Wildness and tranquillity: Low population density towards the estuary creates a remote character. Natural and cultural heritage features: Estuary itself is designated. Significant archaeological resources. Amenity and recreation: Bunratty and Shannon Airport key tourism resources.	Sensitivity to Wind Energy Development Overall Sensitivity: Medium Very large/large wind farm: High Medium wind farm: Medium Small wind farm: Low
Capacity Assessment: There is some capacity in the undulating more enclosed parts of this LCA to accommodate small or medium wind farms. The industrial area around Shannon Free zone may offer potential for auto-production developments. Any developments would have to confirm to land use guidance from Shannon Airport.	
Landscape Character Area East Clare Loughlands	
Key Landscape and Visual Characteristics and Values Scale: Medium to small Landform: Extensive drumlin belt with numerous streams and Loughs. Enclosure: Quite enclosed due to drumlins and hedgerows. Complexity of landcover and features: Agricultural and rural with mosaic of pasture, Loughs, occasional limestone outcrops and peat. Man-made influence: Visible through roads, agricultural activity, archaeology and settlement. Landscape quality (condition) Overall good quality: Wildness and tranquillity Numerous Loughs with trees contribute to a tranquil sense. Natural and cultural heritage features: A number of Loughs are designated as SAC's and considerable Bronze Age sites. Amenity and recreation: Limited recreation and amenity facilities at some Loughs.	Sensitivity to Wind Energy Development Overall Sensitivity: Medium Very large/large wind farm: High Medium wind farm: High Small wind farm: Medium
Capacity Assessment: The enclosed drumlin landscape offers some capacity for wind farms though the small scale of the landscape would support small wind farms only.	

Landscape Character Area

Tulla Drumlin Farmland

Key Landscape and Visual Characteristics and Values

Scale: Medium

Landform: Extensive low drumlin belt

Enclosure: Quite enclosed due to drumlins and hedgerows.

Complexity of landcover and features: Principally agricultural with streams and Loughs draining around drumlins. Small coniferous plantations and pockets of raised bog

Man-made influence: Visible through roads, agricultural activity, scattered settlement, Tulla town and smaller villages such as Feakle.

Landscape quality (condition): Overall good quality.

Wildness and tranquillity: Wildness increases as travel northwards above Tulla towards Sliabh Aughties.

Natural and cultural heritage features: Small number of designations associated with raised bogs. Significant site of Magh Adair and cave systems

Amenity and recreation: East Clare Way.

Capacity Assessment: The landform offers capacity to accommodate wind farms that reflect the small to medium scale of the area.

Sensitivity to Wind Energy Development

Overall Sensitivity: Medium

Very large/large wind farm: High

Medium wind farm: Medium

Small wind farm: Low

Landscape Character Area

Ennis Drumlin Farmlands

Key Landscape and Visual Characteristics and Values

Scale: Medium to small

Landform: Drumlin landform dissected by River Fergus

Enclosure: Frequently enclosed due to drumlins and hedgerows.

Complexity of landcover and features: County town of Ennis key urban areas, surrounded principally by agricultural lands with river Fergus, some broadleaf to the west and south of Ennis.

Man-made influence: Evident in urban settlement and surroundings, Ennis bypass and N18, quarries, farms and rural settlement

Landscape quality (condition): Moderate to good.

Wildness and tranquillity: Neither features strongly

Natural and cultural heritage features: Ballyalla Lough is an SPA, significant cultural heritage features in Ennis and surroundings reflecting long history of settlement in this area.

Amenity and recreation: Facilities in Ennis.

Capacity Assessment: Due to its status as County town and the key communication routes, this area has a significant residential population. Wind farm developments should be short in height to avoid overpowering existing buildings close to urban centres. The more rural areas could accommodate small wind farms.

Sensitivity to Wind Energy Development

Overall Sensitivity: High

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: Low

Landscape Character Area

Fergus Estuary

Key Landscape and Visual Characteristics and Values

Scale: Medium to large

Landform: Flat estuarine area dominated by River Fergus

Enclosure: Quite open and expansive

Complexity of landcover and features: Principally agricultural with very limited tree cover, mudflats associated with estuary

Man-made influence: Long history of human activity around and on the estuary. Estuary islands a significant feature, as are old piers and slips. Eastern part is more densely settled due to Shannon and Limerick influence. A number of small towns and villages.

Landscape quality (condition): Moderate to good

Wildness and tranquillity: Further west increasingly tranquil

Natural and cultural heritage features: Fergus River and Estuary designated SPA. Archaeology associated with estuary generally.

Amenity and recreation:

Capacity Assessment: The ecological sensitivities and the low-lying expansive landscape increase the overall sensitivity of this LCA. Large developments would have considerable impact. Small developments could be accommodated if carefully sited away from the estuary shore and adjoining lands.

Sensitivity to Wind Energy Development

Overall Sensitivity: High

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: Medium

Landscape Character Area Cullenagh River Farmlands

Key Landscape and Visual Characteristics and Values

Scale: Small to medium

Landform: Dominated by Cullenagh River valley within a low drumlin area with associated Loughs.

Enclosure: Enclosure provided by drumlins and tree-cover through hedgerows and deciduous trees.

Complexity of landcover and features: Mosaic of pasture, natural grassland, Loughs with bogs and wetlands.

Man-made influence: Rural settlement, agricultural activity, Inagh and Kilmaley principal nucleated settlements

Landscape quality (condition): Overall good quality.

Wildness and tranquillity: Tranquil and rural.

Natural and cultural heritage features: Historic churches and holy wells south of Kilmaley. No natural heritage designations.

Amenity and recreation: Limited facilities

Sensitivity to Wind Energy Development

Overall Sensitivity: Medium

Very large/large wind farm: High

Medium wind farm: Medium to high

Small wind farm: Low

Capacity Assessment: The landform offers some capacity to accommodate small wind farms that reflect the small scale of the area away from the river valley itself would be preferable using the drumlins as screening to avoid dominating the area.

Landscape Character Area

Kilmihil Farmlands

Please note part of this LCA lies within the Acceptable in Principle Area

Key Landscape and Visual Characteristics and Values

Scale: Medium to large

Landform: Rolling hills with some drumlins type landforms and number of rivers draining through area

Enclosure: Varies from open rolling hills to more enclosed drumlins and hedgerows in lower areas

Complexity of landcover and features: Complex mix of pasture, wetland and bog with some coniferous plantations

Man-made influence: Visible through roads, agricultural activity, scattered settlement

Landscape quality (condition): Moderate

Wildness and tranquillity: Increases with elevation and away from N68

Natural and cultural heritage features: No current designations. Holy wells and churches. Sparse settlement

Amenity and recreation: Limited

Sensitivity to Wind Energy Development

Overall Sensitivity: Medium

Very large/large wind farm: Medium

Medium wind farm: Medium to low

Small wind farm: Low

Capacity Assessment: The rolling hills and drumlins in this sparsely settled areas offer capacity to accommodate wind farm development.

Landscape Character Area

Malbay Coastal Farmland

Key Landscape and Visual Characteristics and Values

Scale: Medium

Landform: Generally low-lying sloping coastal landform

Enclosure: Principally open with limited enclosure

Complexity of landcover and features: Simple landuse of pasture, coastal habitats and small pockets of coniferous forestry

Man-made influence: Evident through recreational and tourism facilities, historic monuments such as promontory forts and agricultural activity

Landscape quality (condition): Good to moderate

Wildness and tranquillity: Proximity to Atlantic creates a sense of wilderness in certain locations

Natural and cultural heritage features: Coastal habitats including sand dunes are designated as SAC's. Megalithic tombs and promontory forts

Amenity and recreation: Important tourism and recreation along the coast

Sensitivity to Wind Energy Development

Overall Sensitivity: High

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: Medium

Capacity Assessment: The open exposed character of this area and its significance as a tourism and recreational area increases the overall sensitivity. Large or medium wind farms would be highly visible particularly close to the coastal area. There may be some limited capacity to accommodate small wind farms further east where the landform is more undulating.

C1.4

Not Normally Permissible

This section details the LCA's that lie wholly or partly within the areas identified as Not Normally Permissible.

Landscape Character Area Burren Uplands	
Key Landscape and Visual Characteristics and Values Scale: Medium to small Landform: Dramatic rocky landscape composed of variety of limestone features interspersed with sheltered valleys. Absence of surface drainage Enclosure: Varied sheltered valleys and expansive limestone pavement and coastal views. Complexity of landcover and features: Distinctive limestone grassland, pavement and high value habitats. Man-made influence: Visible through traditional grazing regimes, density of archaeology, coastal features, tourism and recreational activities. Landscape quality (condition): Overall good quality. Wildness and tranquillity: Remote character in exposed limestone areas. Natural and cultural heritage features: Much of the area is designated as SAC. High density of archaeological sites. Internationally renowned for these two resources. Amenity and recreation: Significant area for tourism and recreation including walking routes.	Sensitivity to Wind Energy Development Overall Sensitivity: High Very large/large wind farm: High Medium wind farm: High Small wind farm: High
Capacity Assessment: This LCA is internationally known for its ecology, archaeology and geology and is currently being considered as an UNESCO Geopark and is on the tentative list for World Heritage Site status. All of these designations combined with its significant tourism and recreational resources create an area highly sensitive to wind farm development. There is no capacity in this area for wind farm development at commercial or community level.	
Landscape Character Area Low Burren	
Key Landscape and Visual Characteristics and Values Scale: A medium to small-scale landscape. Landform: A diversity of landforms with gently undulating areas and low drumlins in the west, valley landscapes and the hills of Mullaghmore and Turloughmore Landcover: Productive grasslands and extensive limestone pavement with Loughs at Inchiquin and Lickeen. Enclosure: Varies throughout the LCA depending on land use and topography Human influence: Significant influences evidenced through grazing regimes, archaeological sites and tourism and recreation. Part of Burren National Park. Landscape quality: Generally high quality. Wildness and tranquillity: Sparse settlement in northern part with more active areas in south Natural and cultural heritage features: Extensive natural heritage and cultural heritage features such as the National Park, Holy Well and Kilfenora diocesan centre Amenity and recreation: An important area for tourism and recreation	Sensitivity to Wind Energy Development Overall Sensitivity: High Very large/large wind farm: High Medium wind farm: High Small wind farm: High
Capacity Assessment: This LCA is internationally known for its ecology, archaeology and geology and is currently being considered as an UNESCO Geopark and is on the tentative list for World Heritage Site status. In addition, part of the National Park is located within this LCA. All of these designations combined with its significant tourism and recreational resources create an area highly sensitive to wind farm development. There is no capacity in this area for Wind farm development at commercial or community level.	
Landscape Character Area Cliffs of Moher and Lahinch Please note: the eastern part of this area has some limited capacity for wind energy development and is included in the Open for Consideration Category. However the coastal parts of this LCA are highly sensitive to such development.	
Key Landscape and Visual Characteristics and Values Scale: Medium to large scale Landform: Wide bays and cliffs along the coastal part, with river valleys within this broadly upland coastal area. Landcover: Principally agricultural and recreational and tourism landuses Enclosure: Broadly open landscape with limited enclosure provided by low tree cover Human influence: Evident through dispersed and nucleated settlements, designed landscapes near Lahinch, Liscannor and Ennistymon, part of the West Clare Railway and tourism activities. Landscape quality: High Wildness and tranquillity: High cliffs and coastline create a sense of wildness in some parts, and areas away from tourism routes retain a more tranquil sense. Natural and cultural heritage features: Significant habitats such as Special Areas of Conservation around the cliffs, and Inagh River a SAC. Holy wells and promontory forts, Liscannor stone and Moher Slate. Amenity and recreation: An important areas for tourism and recreation, concentrated close to the coast.	Sensitivity to Wind Energy Development Overall Sensitivity: High Very large/large wind farm: High Medium wind farm: High Small wind farm: Medium
Capacity Assessment: Upland areas away from the tourism and recreational areas may support small Wind farm developments The exposed nature of the area would require careful siting.	

Landscape Character Area Fergus Loughlands

Key Landscape and Visual Characteristics and Values

Scale: Medium to small

Landform: Undulating low drumlins with Loughs strongly influenced by Fergus Catchment.

Enclosure: Quite enclosed due to low lying topography, hedgerows and hazel scrub on limestone pavement.

Complexity of landcover and features: Mosaic of Loughs, pasture land, scrub, mixed forest and blanket bog towards the east

Man-made influence: Evident in archaeological record, hole wells, Dysert O Dea. Agricultural activity, N18 road and network of rural roads and dwellings.

Landscape quality (condition): Variable, tourism activities centred along the coastal area.

Wildness and tranquillity: Strongly rural and tranquil area

Natural and cultural heritage features: Natural heritage reflected in high number of designations including several Annex 1 habitats. Archaeological resources are significant.

Amenity and recreation: Not extensive other than Dromore Woods and as an access into the larger Burren area.

Capacity Assessment: The significant ecological and archaeological resources in this LCA increase the overall sensitivity and its location as a gateway into the wider Burren Area also reduces the capacity of this LCA to successfully accommodate wind energy developments.

Sensitivity to Wind Energy Development

Overall Sensitivity: High

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: Medium to low

Landscape Character Area Lough Graney

Key Landscape and Visual Characteristics and Values

Scale: Medium to small landscape orientated around Lough.

Landform: Distinctive glacial valley runs south east from Lough Graney with foothills of Sliabh Aughties surrounding the Lough

Landcover: Deciduous woodland fringe around the Lough with grassland predominant in the undulating farmland around the Lough.

Enclosure: Greater enclosure around the farmland and on the Lough shores due to vegetation

Human influence: Evidenced through farming activity, cultural associations and megalithic tombs.

Landscape quality: Very high quality, attractive well managed landscape

Wildness and tranquillity: Strong tranquil sense and an intimate landscape in parts.

Natural and cultural heritage features: Strong associations with Brian Merriman and the Midnight Court, megalithic tombs and strong folklore associations

Amenity and recreation: East Clare Way and hostel located on shores of Lough Graney

Capacity Assessment: This LCA is highly attractive and a good example of a working agricultural landscape. Its situation within the wider Sliabh Aughties creates a tranquil and intimate landscape orientated around the Lough and the foothills. Any tall developments within this LCA would have a profound impact and would detract considerably from the landscape character.

Sensitivity to Wind Energy Development

Overall Sensitivity: High

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: High

Landscape Character Area Lough Derg Basin

Key Landscape and Visual Characteristics and Values

Scale : Medium to large

Landform: Largest Lough on the River Shannon dominates and is framed by low foothills and uplands of Sliabh Bernagh and Arra Mountains. The northern part is more low lying and extends into the Shannon callows area around Co. Galway

Landcover : Mix of pasture, deciduous Lough shore woodland, and small settlements.

Enclosure: Very open on Lough shore, more enclosed due to trees and hedgerows away from the Lough

Human influence: Apparent in early Christian settlements at Inis Cealtra, archaeological sites, recreation and tourism and agriculture.

Landscape quality: Generally very good.

Wildness and tranquillity: This change across the LCA with increasing sense of tranquillity and wildness close to Lough and Lough shore.

Natural and cultural heritage features: Number of national monuments such as Brian Boru's fort and Lough Derg is designated as SPA and cSAC

Amenity and recreation: Important tourism and recreational sites such as Killaloe and Mount Shannon.

Capacity Assessment: The Lough itself has a number of natural heritage designations and is on a tentative list of World Heritage Site nomination due to the early Christian monastic site at Inis Cealtra.

The Lough and surrounding hills and uplands create a distinctive landscape character area that would be impacted by wind energy developments In addition, the importance of the LCA as a tourism and recreational area increase overall sensitivity to developments.

Sensitivity to Wind Energy Development

Overall Sensitivity: High

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: High

Landscape Character Area Loop Head Peninsula

Key Landscape and Visual Characteristics and Values

Scale: Medium

Landform: Flat peninsular with dramatic coastline and more sheltered bays in the south. Low ridges of hill close to coastline.

Enclosure: Largely open with southern bays more enclosed.

Complexity of landcover and features: Pasture with raised bog towards the north and estuarine and coastal habitats.

Man-made influence: Visible through roads, agricultural activity, scattered settlement and tourism activities around Kilkee and fishing activity in the southern part.

Landscape quality (condition): Overall good quality.

Wildness and tranquillity: Increasingly wild towards Loop Head and on the northern part of the Loop Head.

Natural and cultural heritage features: Loop Head designated SAC and coastal area and SPA. Sragh Bog an SAC. Ladder fields and area west of Kilkee long settlement history since Bronze Age.

Amenity and recreation: Tourism and recreational facilities around Kilkee, Doonbeg, Carrigaholt.

Capacity Assessment: The open exposed and low-lying landform combined with a spectacular coastline especially in the north increases the overall sensitivity of this LCA. In addition there are a number of significant natural heritage designations around Loop Head and Poulfnasherry Bay.

Sensitivity to Wind Energy Development

Overall Sensitivity: High

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: Medium

Landscape Character Area Sliabh Aughty Uplands

Key Landscape and Visual Characteristics and Values

Scale: Medium to large

Landform: Rolling hills over large mountainous range.

Landcover: Extensive coniferous plantations and some large areas of blanket bog interspersed with more pasture on lower slopes.

Enclosure: Plantations and hedgerows on lower slopes create some enclosure.

Human influence: Sparse settlement with nucleated settlement at Whitegate and Feakle. **Agricultural activity:**

Landscape quality: Variable, good in parts whilst older plantations do not reflect landform

Wildness and tranquillity: Wild and remote on higher areas especially where blanket bog remains.

Natural and cultural heritage features: Megalithic tombs and large tracts of area designated as SPA.

Amenity and recreation: East Clare Way and folk music associated with Feakle.

Capacity Assessment: This large LCA is principally designated as a Special Protection Area. The NPWS expressed concern about the cumulative impacts of wind energy developments within this area which includes parts of County Galway.

Sensitivity to Wind Energy Development

Overall Sensitivity: Medium to low

Very large/large wind farm: High

Medium wind farm: High

Small wind farm: Medium







COMHAIRLE | CLARE
CONTAE AN CHLÁIR | COUNTY COUNCIL

Áras Contae an Chláir
New Road, Ennis
County Clare V95 DXP2
www.clarecoco.ie