"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

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DECLARATION OF ORIGINALITY

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The substance of this thesis is the original work of the author and due reference and acknowledgement has been made, when necessary, to the work of others. No part of this thesis has been accepted for any degree and is not concurrently submitted for any other award. I declare that this thesis is my original work except where otherwise stated.

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15-9-2010

Date

DEDICATION

I wish to dedicate this thesis to my family, especially my parents Mike and Marie for their continuous support, encouragement and help throughout my academic studies.

ABSTRACT

The threats posed by climate change are placing governments under increasing pressure to meet electricity demand from low carbon sources. Wind energy has been has been identified as one of the main technologies to help in meeting these demands. The public in general favour wind energy yet proposed targets for generation capacity lag behind proposed goals. The NIMBY phenomenon has been suggested as one of the reasons why we are behind our wind generation capacity targets. It is a common mistake to take general support for granted and expect the public to support developments when confronted with them in their local area. In many cases it is not unheard of that governing bodies whether social, political, regulatory, environmental, or cultural can overrule general public support and halt developments. Motives to halt developments will vary depending on the institutional body involved. The problem with the term NIMBY is that it is too basic a term to describe the broad spectrum of complex motives that various institutions including the public may have against a development. This research focuses on a case study where the developer had major problems with the local county council and its wind energy policies when he was erecting a wind turbine despite having gained planning permission. A survey questionnaire was also used as part of the research to seek the perception a rural community had on wind energy. The research findings and results are discussed with respect to the literature review highlighting a general public support for wind energy and the influence institutional bodies have over the progress of developments.

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1.0 Introduction

1.1 Introduction

"Compared to other kinds of electricity production, a vast majority favours wind energy. It seems, therefore, quite puzzling why it is so hard to succeed in building new wind turbines..."

Wolsink, 2000 p. 50

The wind energy debate has been characterized as a unique environmental struggle. One side of the argument consists of advocates who make reference to environmental benefits such as no emissions and reduced water usage (Slattery and Swofford, 2010). On the other side of the argument are those who oppose wind energy projects because of local externalities such as visual landscape impact and noise (Groothuis et al., 2008). These individuals find that the technology used to produce electricity is simply too visible and disruptive (Righter, 2002). The acceptance of wind energy is generally high but developments are often opposed. One of the most common referred to explanations for this gap in attitudes has been the NIMBY (Not In My Back Yard) phenomenon (Slattery and Swofford, 2010).

Several studies have demonstrated various definitions of this supposed phenomenon. The following are some examples of these:

- The basic theory is that people support wind energy on an abstract level but object to specific local projects because of expected consequences concerning primary noise and visual impact (Krohn and Damborg, 1999 p. 957).
- .... the phenomenon that certain services are in principle considered as beneficial by the majority of the population, but that proposed facilities to

provide these services are in practice often strongly opposed by local residents (van der Horst, 2007, p. 2705).

- The idea of NIMBY is rather simplistic as it suggests that people have positive attitudes towards something until they are actually confronted with it, and that they then oppose it for selfish reasons (Wolsink, 2007, p.1199).
- NIMBY is used to describe opponents of new developments who recognise that a facility is needed but are opposed to its siting within their locality (Burningham, 2000, p.56).
- More formally, NIMBY refers to the protectionist attitudes of and oppositional tactics adopted by community groups facing an unwelcome development in their neighborhood (Dear, 1992, p.288).

It can be easily seen that when definitions of the term NIMBY are presented they can be variable and not always clear.

Since its conception, the term 'Not In My Back Yard' (NIMBY) has become popular amongst the public, media and academics alike as an expression to describe any form of local opposition to almost any development (Burningham et. Al., 2006; Wolsink 2007). Despite ubiquitous usage, NIMBY is actually a very specific term referring to a situation in which someone has a positive attitude towards something in general but accompanies this with a motivation to oppose its installation locally, due to reasons of self interest (Wolsink, 2007). The controversies surrounding NIMBY as both a catchcall term for opposition and as a means of explaining the discrepancy between the high levels of general support for wind and low levels of planning success, has prompted much debate (Eiser & Jones, 2009). Recent research has sought to establish how good NIMBYism is as an explanation for the social gap that is existent between perceived support for wind power in general and low levels of planning success (Bell et al., 2005). The use of NIMBY has been highly criticized (Bel et al., 2005, p. 460) "the NIMBY concept has

rightly been criticised on the grounds that it fails to reflect the complexity of human motives and their interaction with social and political institutions".

1.2 Outline of Chapters

Chapter 2 is a review of existing literature in the area of wind farm development and NIMBYism. This is to establish varying social perspectives. In this chapter a discussion of the findings and conclusions of earlier researchers takes place. Chapter Two introduces the idea of the proximity hypothesis and a backyard in its general context. There is evidence to suggest that NIMBY may be too broad a term to describe complex human emotions when opposing a development within a particular locality. It then goes on to focus on American society where it is suggested that American attitudes are contradictory in terms of what they want from their power technologies. There are two case studies within this section based on American wind farm projects in Cape Cod and Northern Texas. The literature review then moves onto European societies such as the United Kingdom, Ireland and mainland Europe. This was done in order to determine the obstacles that prevent wind farm development across European nations. An important aspect of this study is the individual's attitude toward having a wind farm in his/her 'back yard'. The study of backyard and proximity to a wind farm are also vital. Therefore a detailed review is made of the literature that exists in this area. The following research objective emerged:

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

Chapter 3 contains a discussion of the process that led to the choice of research methods that would be used for this particular study. The research questions that will help meet the research objective are formulated in this chapter.

1. Why are there high levels of general support for wind energy and low levels of planning success?
2. How good is the term NIMBY as an explanation for the social gap that exists between perceived support for wind power and low levels of planning success?

There is a brief discussion on some of the philosophical assumptions of research and an introduction to the various approaches available in terms of research. The research strategy for this study is then outlined. The chapter concludes with a discussion of the case study method, survey questionnaire and triangulation techniques. Other data gathering techniques that will be employed are also listed.

Chapter 4 consists of a presentation of the case study findings and survey results. This chapter begins with a descriptive narrative of the events of the study in order to provide the reader with an overall understanding of the case. This basically involves telling the story of the case. It then moves onto the objectives and background of the survey. Here the results are presented and discussed.

Chapter 5 will analyse the research findings presented in chapter 4. This analysis of the data gathered and presented will provide answers to the research questions. Conclusions will be drawn from these findings which will be compared to and integrated with the arguments and theory from the literature discussed in Chapter 2.

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

Chapter 2

Literature Review

2.0 Literature Review

2.1 Introduction

A literature review can be simply defined as essentially reading and critically appraising what other people have written about in your subject (Naoum, 2007). The literature review began on this thesis during the author's academic year when researching potential topics. Through the research, an interest developed within the area of the NIMBYism and its link to the slow development of wind farms in Ireland despite an abundance of the resource being available.

2.2 The Proximity Hypothesis

The term 'backyard' is used in NIMBY discussions and it relates to geographic proximity to the site causing controversy. The NIMBY explanation describes how an individual is willing to support wind energy when turbines are not located in his/her 'backyard'. It is expected that the closer the individual is to a windfarm the greater his/her opposition towards it would be (Slattery and Swofford, 2010). This explanation of attitudes has been commonly referred to as the proximity hypothesis.

A recent study (Johansson and Laike, 2007) showed no differences regarding opposing additional turbines between three groups living at varying proximities from a particular wind farm. These results contest the proximity hypothesis. The study found that those living closest to the wind farms did not show the most negative attitudes towards them. Warren et al. (2005, p.866) defines this as "an 'inverse NIMBY' syndrome, whereby those with windfarms in their backyard are amongst the most supportive of the technology". Results from this study provide evidence to support a positive relationship between proximity and degree of acceptance of a wind farm thus suggesting that the NIMBY phenomenon does not fully explain variations in public attitudes towards wind farms.

2.3 *Rejecting Renewables*

A study was conducted (Sovacool, 2009) investigating the rejection of renewable energy systems due to socio-technical impediments in the United States. Socio-technical is a term that encompasses the technological, social, political, regulatory and cultural aspects of electricity supply and use. The question is asked, if renewable power systems deliver such impressive benefits why do they still only provide 3% of national electricity generation in the United States?

Extensive interviews of public utility commissioners, utility managers, system operators, manufacturers, researchers, business owners and ordinary consumers revealed that it is the above mentioned socio-technical barriers that often explain why wind, solar, biomass, geothermal and hydroelectric power sources are not embraced. Utility operators reject renewable resources because they are trained to think only in terms of big conventional power plants as opposed to micro generation systems. Consumers ignore renewable power systems because they are not given accurate price signals about electricity consumption. Intentional market distortions such as subsidies and unintentional market distortions such as split incentives prevent consumers from becoming fully invested in their electricity choices. The existing system of pricing electricity favours conventional methods. The American utility sector concentrated on making electricity abundant and cheap with the assistance of regulators and politicians who subsidize all forms of energy. This shields the consumer from true costs of extraction, generation and distribution. As a result, newer and cleaner technologies that offer social and environmental benefits but are not consistent with the dominant paradigm of the electricity industry continue to face comparative rejection.

The article suggests that renewable technologies would provide the cheapest forms of power generation if all costs and benefits were accounted for such as life cycle costing and the benefits of these systems. It also suggests that Americans want contradictory things from their power technologies. People crave inexpensive prices and minimal harm to the environment, but also want energy systems to be unobtrusive and abundant. Social

attitudes regarding a technological society and material standards of living motivate Americans to use more electricity. However, this hampers the acceptance of renewable power generators near population centres where they are needed most as renewable power generators bring to the foreground what previously seemed invisible. System components of the dominant electrical utility systems such as generators, transmission lines and substations were the product of social negotiation and compromise. Williams (2001) argues that with technological landscapes in place, people fold them in their psyches where they eventually become removed from consciousness.

2.3.1 Cape Wind

This is the name of an off-shore wind development on the south coast of Cape Cod and is approximately 25 km from the island town of Nantucket. The project envisions 130 horizontal-axis wind turbines, 134 metres tall, rising from the ocean. The footprint of the proposed project covers 62 km2. After more than eight years of lawsuits and government reviews, the Obama administration granted permission for the project to go ahead making it the USA's first offshore wind farm.

The project has been a source of much controversy from environmentalists, an Indian tribe and some residents including the late senator Edward Kennedy. Senator Kennedy argued that the windmills would damage the ocean view. The turbines would be visible from the Kennedy compound located at Hyannis Port (Lindsay, 2010).

Members of the Aquinnah Wampanoag Tribe of Martha's Vineyard have sworn to take the project to court. Their argument is that Cape Wind would interfere with sacred rituals and damage long submerged tribal burial sites (Lindsay, 2010). Charter and commercial fishermen who rely on Nantucket Sound as a source of revenue also oppose the project. Recreational fishermen are concerned that the construction of the turbines could disturb the marine ecosystem which serves as a habitat for bluefish, tuna and striped bass. Commercial fishermen on the other hand are worried that the construction along the ocean floor could pose a threat to the species of fish that feed along the sea bed such as

cod and haddock (Fulham, 2010). It is evident that concern for the revenue of local fishermen has been a central rallying point for opposition groups.

In general however, public opinion has favored Cape Wind. According to a 2008 poll conducted by the Opinion Research Corp. 86% of Massachusetts residents and 74% of Cape and island residents support the project (Fulham, 2010). It should be noted that Cape Wind was first proposed in 2001 but was only granted permission to go ahead in 2010. The announcement came early in April 2010 after the occurrence of two major catastrophic disasters. One was in West Virginia and the other in the Gulf of Mexico. The announcement appears to be was a political strategy to divert some attention from the disasters. However, at the time, the scale of the disaster in the Gulf of Mexico was not yet realized. These disasters illustrated with great force the potential damages caused from extracting oil and coal in order to meet the world's rising energy demands (Lindsay, 2010).

2.3.2 Texas Wind Attitudes

Within the United States, Texas currently has the largest wind energy capacity with 8797 MW generation capacity and 660 MW under construction. A study was conducted (Slattery and Swofford, 2010) in order to achieve a better understanding of how wind energy is being perceived by the public within close proximity to windfarm development in northern Texas. This was carried out by developing a survey questionnaire which explored perceptions of wind energy in the region as well as general attitudes towards energy and the environment. Results were categorized into three primary themes:

1) Environmental Attitudes
2) Wind Energy Attitudes
3) Findings Relevant to Proximity

The attitudes of a community living in close proximity to a wind farm showed overall support for the wind farm and wind energy in general. People living farthest from the

wind farm development demonstrated a greater willingness to support wind energy in various locations. The results from this study show an overall concern for the environment with less concern with issues relating to climate change and fossil fuel use.

The study concludes that if wind energy development expands in Texas as anticipated, more efforts should be put on increasing public participation in the planning process. This will allow advocates and opponents of local wind farm projects to form educated opinions on many of the issues surrounding the development of wind energy. The world is getting ready to enter a new era with less dependence on fossil fuels which will change the way in which the public think about energy. It is inevitable that this will bring about new forms of technology to landscapes, with wind turbines being among the first examples of this change to landscapes. How society perceives and accepts these technologies on the landscape will determine their success and development.

2.4 Opposition in the UK

Jones and Eiser (2010) conducted a study to determine 'local' opposition to wind development in the UK. High levels of support are present for the technology in principle but specific projects have been delayed or rejected due to local opposition. Their main source of research was through conducting survey questionnaires where participants were required to register their opinion towards development at a number of on and off shore sites in the UK. Their exploratory research was intended to determine the extent of a 'backyard'.

The study found generally there was a gradual increase in positive attitudes towards development with increasing distance from sites identified in the surveys. Evidence from the study also suggests that there is concern that developments would spoil both landscape and skylines. Onshore location analysis exposed that development upon the identified sites was clearly the least favoured option amongst participants. However, the results can be interpreted that as long as onshore development is out of sight, then it is likely to be considered relatively acceptable. On average from the study, respondents

demonstrated a clear preference for offshore development. The sample was sensitive to the potential impact that onshore development might have on communities and the landscape, thus favouring offshore development where these issues are reduced. This preference is motivated by a desire to limit landscape damage and visual impact in alternative onshore locations. Recent research has begun to demonstrate that 'backyards' may not necessarily terminate at the shoreline and thus development in offshore locations can be greeted with opposition when the Cape Wind project is considered (see 2.4.1). It should be noted that this study was conducted in areas around Sheffield. Geographically, Sheffield is a land locked city located in the English midlands. This would affect survey results regarding increased positive attitudes to offshore development over onshore due to increased distance from communities in Sheffield.

Overall the study found that opposition to windfarm development was not solely determined by spatial proximity to a proposed development. It showed that an individuals 'backyard' is apparently defined by the extent to which a development is directly visible. This coupled with a concern that development will spoil the landscape heavily influences the levels of endorsement received for particular sites.

2.5 NIMBY or Not?

Horst (2007) explored the relevance of location and the politics of voiced opinions in renewable energy siting controversies. Proximity does play an important role on public attitudes towards proposed projects. However he argues that "the nature, strength, and spatial scale of this effect may vary according to local context and 'value' of the land. It was found that residents of stigmatized places are more likely to welcome facilities that are green. On the other hand people who derive their sense of identity from rural landscapes are most likely to resist developments.

Burningham (2000) disputes that the term NIMBY is often used by proponents of a facility as a way of discrediting project opponents. Horst then states (2007, p. 2705) "most researchers now seem to agree that this phenomenon is rather complex, and that

the selfish element is only one of many possible reasons why people may oppose a particular local development". The context of NIMBY implies some sort of geographical catchment area for self-centered behavior and opposition to development is usually dominated by locals (Horst, 2007).

Warren et al. (2005) measured public perceptions at varying distances to wind farms found with two Irish case studies, support for wind farms was higher in areas closer to the wind farm than further away. The study showed a strong positive effect of distance regarding dislike for a proposed wind farm. Devine – Wright (2005) reinforces this through identifying that negative impacts of renewable energy are usually local in nature, such as noise or visibility from the location of residence.

2.5.1 Characteristics of Low Public Resistance

Success in gaining planning permission can come from specific strategies as found by managers of the ARBRE wood gasification plant (Upreti, 2004) in Eggborough, England. This site is an area of low landscape value and industrial heritage. Community relations were part of their approach but their site selection strategy also included social suitability criteria. The manager stated that communities with a mining or industrial history understand that electricity does not come 'out of the light switch' but has to be produced in a plant somewhere and that fuel needs to be produced, stored and transported to that plant. Toke (2005) reports of a large wind farm in Goole near Eggborough received planning permission with ease thus suggesting that these communities have certain characteristics making them open to such developments or less likely to oppose them.

2.5.2 Opinions of Local Residents

The following figure displays a theoretical model taken from Horst (2007). It explains the major categories of opinion before and after a local renewables project is proposed.

granted and to expect people to welcome developments they claim to support. New developments have proven difficult to realize and the growth in wind power capacity lags behind proposed goals."

2.6.1 Attitudes on Wind Power Application

Wolsink (2000) found that small scale surveys revealed some perceived disadvantages of wind energy such as noise pollution causing annoyance, spoiled scenery, interference with natural areas, particularly bird endangerment, unreliability of energy supply (wind is an intermittent resource), supposed expensiveness of wind as a source of energy. Despite these perceived disadvantages, the strongest impact on attitudes was concern over the aesthetic value of wind turbines. The public generally perceive turbines intrude on scenery and landscape. Noise pollution and hazards to birds had a small impact on attitudes. However, attitudes from the small scale surveys showed strong general support for wind energy as previously mentioned. It must be noted that positive attitudes will not automatically result in support for a proposed project. Wolsink (2000, p. 51) states "The decision to support or oppose a project will depend on the visual quality of the site". If the public perceive the visual quality of a project as positive, people will then support it. The opposite is also true even though they remain supportive of wind power in general.

2.6.2 Institutions Overruling Public Attitudes

Powerful contradictions between renewable energy and environmental values often become obvious (Wolsink, 2000). Wind energy generally requires sites in environmentally valued locations. These locations often play a role in public debates on wind developments where it can be found that environmentalists consider the development of wind power as challenging from a conservationist point of view.

2.6.2.1 The Waddensea Wetland

This is an ecologically important area of shallows in the Netherlands which extends along the coast of Germany and Denmark. This area contains almost half of the economically

feasible wind energy potential in the Netherlands. However, international agreements and national law state that development within the region should be considered regarding ecological consequence.

The WaddenVereniging (Wadden Union) was founded in the sixties and acts as a national environmental organization. According to Wolsink (2000), the WV often objected to proposed wind farms in the area. Their legal prowess caused most of these projects to be cancelled. Despite this, the WV felt caught in a dilemma causing a struggle among members. In order to break the standoff an advisory commission were summoned to prepare a survey for all members. Results of this survey showed there was not a majority supporting the policy of rejecting wind farms in the Wadden area. A majority favoured building turbines on selected sites.

From the survey it appeared spoiling the landscape was the strongest reason to oppose developments. Birds in the area were of a secondary concern and the contribution of wind energy slowing the green house gas effect was insignificant. This indicates that the choice between sustainable energy and ecological values is not a dilemma for members. Members assess the acceptability of turbines regarding visual intrusion and consequences on the chosen location. This suggests that in a sensitive area such as the Wadden suitable sites will exist for turbines.

2.6.3 Institutional Arrangements

The reserved attitude of the WaddenVereniging against more accommodating attitudes of its members is an example of the decisive impact of institutional arrangements. This advocates that institutional constraints are more important than public acceptance. Wolsink (2000) calls on the need to build up institutional capacity for improved development of wind power where there is a collaborative style in siting wind energy infrastructure as opposed to top-down planning. Institutional capacity has three dimensions: knowledge resources, relational resources and mobilization capacity. He argues that strong public support is not enough for the development of wind power capacity but it will contribute to siting policies. Wolsink then concludes in has paper

(2000) that developers must concentrate on building institutional capacity rather than complaining about public attitudes. He also stresses (2000, p. 63) the necessity of "reducing the arrogance of utilities, wind power developers, and public bodies involved".

2.7 Irish Public Body Intervention

There is evidence in Ireland of public body intervention on many projects. Dublin's Poolbeg incinerator is an example of this. Articles from the Post (25 July 2010) and the Independent (March 2010) have dealt with this matter.

Covanta are a US firm who are Dublin City Council's partners on the Poolbeg development. They are unable to proceed with the €350 million project until a ventilation system has been constructed on the foreshore at Poolbeg. The firm claims that the licence required for the vent is being delayed by Environment Minister, John Gormley. The incinerator is planned to be opened in 2013 and is located in the minister's constituency. Minister Gormley is opposed to the incinerator and fought his previous election campaign on those grounds. Covanta's European president said the delay in obtaining the foreshore licence was the biggest single obstacle to work starting on the incinerator.

The four Dublin local authorities have a legal agreement to supply 320,000 tonnes of waste to the facility each year. Failure to meet these requirements will result in financial penalties to the four councils as per the "put or pay" clause of the contract. Barrister John Hennessy has been appointed to head an inquiry into the financial risks facing the city councils on the Poolbeg incinerator. Financial risk is the basis for Minister Gormley's opposition to the incinerator. He argues that waste levels have been falling during the economic downturn and this increases the danger of the four councils not meeting the required levels of waste.

2.8 *Planning Documents*

A number of planning documents were obtained from An Bord Pleanála, Cork County Council and Limerick County Council websites. The researcher found one project that was granted permission in Cork and one that was refused permission in Limerick. Useful information was obtained on matters such as project details, independent party assessments, third party objections, local resident objections, responses to objections and reasons for refusal.

2.8.1 Castlepook, Ballyhoura, Co. Cork

This project was granted permission in March 2004 with conditions by the local planning authority.

Development: Windfarm incorporating 12 turbines, 50 metre anemometer mast, control building, fencing and access on a site of 16 hectares.

2.8.1.1 Environmental Impact Statement

An environmental impact statement (EIS) was submitted with the application. The main findings are summarized below:

Humans: The proposed development indicates no significant impact to humans. The EIS notes the absence of dwellings in the vicinity of the development.

Noise: Predictions of noise levels were made using computer modeling and noise impacts were found not to arise.

Visual: The nature of the Ballyhouras and the rise from a low lying landscape means that the development will have a major impact on the immediately surrounding area.

Birds: The Ballyhouras are a stronghold for nesting hen harrier. Turbines are located with one exception in areas that are not of importance to nesting and only marginal foraging habitat. Effects of construction works during the nesting period can be mitigated by avoidance of works in an identified nesting area.

Flora: Large scale conifer plantations dominate the area. No threatened or legally protected plant species occur within the site.

Air Quality: There will be no emissions to the atmosphere. The overall impact will be the reduction of greenhouse gas emissions nationally (CO2, SO2, NOX).

Drainage: The development does not involve discharge to soils or watercourses.

Tourism: The development will not have any adverse impacts on tourism on any scenic route as the area is dominated by commercial forestry.

Heritage: No archaeological sites are identified in the area and the development does not impede on any recorded features of historic interest.

2.8.1.2 Third Party Appeals

The following are the third party appeals to the Castlepook development:

- The development will have negative impacts on the hen harrier and the merlin. These are annex one species under the EU Birds Directive.
- The Ballyhouras have the highest density of hen harriers in Ireland, the area is under consideration as a Special Protected Area.
- Studies indicate the hen harrier will not breed within 500 meters of a turbine.

- General disturbance from people and vehicles visiting the site will impact on hen harriers.

2.8.1.3 Observer Appeals

The following are appeals from local residents to the Castlepook development:

- Female objects to turbines located near her house on the grounds of noise, visual issues and traffic.
- Male objects to development referring to unsightly views, health hazard, impacts to wildlife, the area is of historic importance and impact on local roads.
- Male objects due to pollution in local rivers, visual impacts and local road impacts.
- Female objects due to visual impact on property, the effect on the value of her lands, water and geology.
- Females object based on visual impact of mountains and damage to local roads.
- Male objects due to risk of landslides and effects to the road network.
- Female objects on the basis of questioning the site as an appropriate wind resource.
- Male objects for several reasons including public notice was in a remote location, turbines will be imposing on the Ballyhoura landscape, other countries are reconsidering the use of hilltop locations.

2.8.1.4 Independent Assessment

From the inspector's report the assessor felt that the main planning issues were visual impact, impact on fauna (hen harrier), traffic, noise and landslides.

Visual: Appellants argued that the EIS was inadequate in this area while the assessor was in agreement with it. He feels that the proposed development can be accommodated on the site and the overall visual impact would not be significant. Impacts near the site are variable. The development is visible from the south but but extensive areas of forestry on the upper slopes reduce this impact. Given the distance from the nearest dwellings the development should not devalue properties or affect the sale of land for sites.

Fauna: The EIS dealt with this adequately and offered proposals for mitigating effects during and after construction.

Noise: The DoELG requires noise levels measured externally at any dwelling should not exceed 40 dBA. There are no dwellings in the vicinity of the appeal site. The EIS proves that the development is acceptable in terms of noise impact.

Landslides: A report by a qualified hydroleologist regarding stability of soil and landslide risks in the area. The report concluded that there is no peat cover on the site and there is no topographical or geotechnical evidence to the harm the development on site.

The assessor concludes having taken consideration of the national policy, provisions of the County Development Plan, the decision of the planning authority and the grounds of appeal that the development is consistent with planning and sustainable development of the area.

2.8.2 Sliabh Reagh, Kilfinnane, Co. Limerick

This project was first refused permission in July 2001. The first party wished to appeal this decision. The appeal was also refused permission despite the recommendation within the independent inspector's report.

Project: The proposal was for the layout and associated site works including access track for three 850 kilowatt wind turbines with a rotor span of 52 metres, a sub-station and control room. The site area was stated to be 30 hectares.

Location: Sliabh Reagh is located approximately 13 miles south-west of Tipperary town and 9 miles north-west of Mitchelstown in north Cork. The hill rises to 467 metres. The area is sparsely populated. Sliabh Reagh carries large expanses of coniferous forestry and there is a telephone mast close to the highest point. It is part of the Ballyhoura Mountains where the Castlepook development is located (see section **2.8.1**).

Within the inspector's report it is noted that the applicant put a lot of time and effort into informing and educating local communities regarding the project. It was found that all communities were in support of the project and a number of letters were submitted from local groups also supporting the project. Despite this, the appeal was not granted. The first party grounds of appeal were based on arguing that the development would be in accordance with proper planning and development of the area having regard to:

- Emissions reductions set under Kyoto.
- National requirements under AER to develop 40 MW with small scale wind energy projects.
- The site location did not come within specific restrictions for scenic areas as set out in Limerick's County Development Plan.

Within the locality of the development there was one male who objected to the proposed development. He supported the project in principle but only for two turbines, as turbine three was to be located near his farm land affecting his livelihood and the value of his property. In order to accommodate this, the first party submitted additional information where turbine three was relocated away from the observer's land boundary. The first

party also had a letter dated in 1994 from the male who objected to the development, stating he was in favour of siting wind turbines on his own lands.

Recommendation: The planning authority refused permission based on serious injury to visual amenity in the area. However, the inspector argued that in his response to this that there is an existing telephone mast near the top of the mountain and is clearly visible in many local views. The maximum height of each turbine would be 73 metres. The report concludes (p.9) with "regard to the size and small number of turbines proposed, the form and characteristics of the landscape, the separation distance from housing, centres of population and regional roads, the provisions of the Windfarm Guidelines which I interpret to generally favour such developments on appropriate sites, and to the absence of any specific amenity designation or listings for this area as set out in the county development plan, I conclude that the proposed development would not seriously injure the visual amenities of the area. I recommend that planning permission be granted".

Refusal: The Limerick County Council considered the development, "by reason of its exposed position on a prominent ridge line it would form an excessively prominent and obtrusive feature on the landscape and would therefore seriously injure visual amenities of the area and be contrary to the proper planning and development of the area".

2.8.3 Limerick County Development Plan 2005-2011

The following figures are two maps. Figure 2 is a map of county Limerick which illustrates areas suitable (green), areas unsuitable (red) and areas open to consideration (yellow) regarding wind energy development. Figure 3 also shows a map of county

Limerick. The difference with this map is that it highlights areas over 500 feet (orange colored areas), essentially where the best wind resource would be on an inland county.

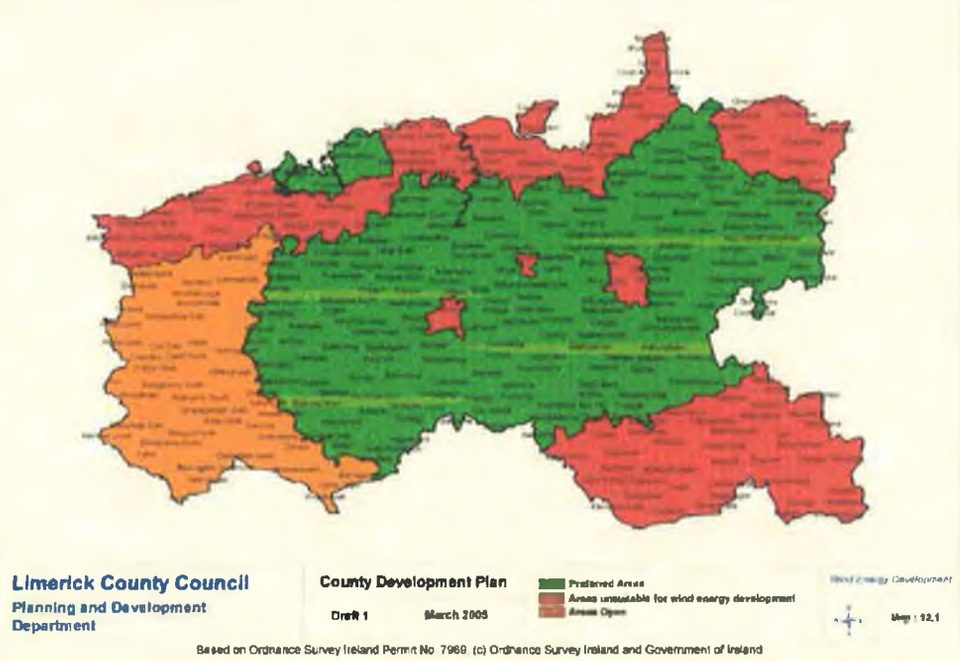

Figure 2: Wind Energy Development County Limerick

Figure 3: County Limerick Profile Map

Limerick is essentially an inland county except for the Shannon estuary on the north side. Typically wind resources are present for inland counties on higher ground. If you examine the two previous maps you will notice that low lying areas are encouraged for wind energy development in county Limerick. These are areas where there would not be enough of a resource to make a wind farm development feasible.

2.8.3.1 Unsuitable Areas

The following areas are considered unsuitable under the county development plan for wind farm development:

Ballyhoura: These are a dominant range of hills running up the Cork boundary. The Ballyhouras are located on the south east of Limerick. The lowland component of this landscape character area is generally a farmed landscape but the range of hills provides an upland backdrop. Upper levels of Ballyhoura are used for commercial forest. This area is not considered suitable for wind energy development. However it should be taken into consideration that there is a wind farm on the Cork side of the hills in Castlepook. There is also one turbine on the Limerick side but this was erected before the county development plan was published.

Galtees: This is the most visually striking of all Limerick's uplands. They are also located on the south east of Limerick and stretch into Cork and Tipperary. The open upland terrain of the higher reaches of the Galtees coupled with starker colours, caused by the vegetation cover, provides a strong visual contrast to the enclosed pastoral landscape below. For this reason the area is regarded as being unsuitable for wind energy developments.

Knockfierna: This hill is located in the centre of the county and is highlighted in red on the map. The hill is important not just for its scenic value but also because of the variety of archaeological sites that exist on it. This is reason enough as to why the area is considered unsuitable for wind energy development.

Shannon: This zone comprises a large area of the northern part of county Limerick and is bounded on one side by the Shannon Estuary. One of the main features of the area is the presence of the estuary, which is perhaps the defining characteristic of the region. This area is considered as being unsuitable for wind energy except for the townlands indicated on figure 2. It is recommended under the development plan that single lines of equally spaced turbines should be considered in proposed windfarm developments to limit the visual and landscape impact.

Slieve Felim: The Slieve Felim Hills located in the north east of the county are the most dominant feature in this part of the county though they are not particularly high (average height 395m). It is because of the low-lying surrounding landscape that they appear such a dominant feature. This is why the area is considered unsuitable for wind farm development. However it should be noted that these hills also stretch over the Tipperary border and there are four wind turbines on the Tipperary side in the parish of Kilcommin.

2.8.3.2 Suitable Areas

The following areas are considered unsuitable under the county development plan for wind farm development:

South West: The Mullaghareirk range of hills, passes the County Limerick, Cork and Kerry boundaries, is the principal defining feature of this landscape. Commerical forestry most of which is nearing maturity is a dominant

feature of the hills.This area is open to consideration for wind energy development following consultation with the National Parks and Wildlife Service. There is already a windfarm present in this area in Tournafulla.

West: This upland is clearly visible from Newcastle West. Any visual disturbance would be very obvious. This area is open to consideration for wind energy development. It is recommended that a random spacing layout is considered in proposed windfarm developments to limit the visual and landscape impact. It should be noted that the Tournafulla wind farm is also visible from this area.

2.9 Conclusion & Research Objective

The definition of a clear research objective has been deemed the most critical step in the research process as it provides a clear understanding of the scope of the research topic area (Jenkins, 1985). After reviewing the literature it became clear that the acceptance of wind energy is generally high but developments are often opposed. One of the most common referred to explanations for this gap in attitudes has been the NIMBY (Not In My Back Yard) phenomenon (Slattery and Swofford, 2010). The controversies surrounding NIMBY as both a catchcall term for opposition and as a means of explaining the discrepancy between the high levels of general support for wind and low levels of planning success, has prompted much debate (Eiser & Jones, 2009) The use of NIMBY has been highly criticized (Bel et al., 2005, p. 460) "the NIMBY concept has rightly been criticised on the grounds that it fails to reflect the complexity of human motives and their interaction with social and political institutions". One side of the argument consists of advocates who make reference to environmental benefits such as no emissions and reduced water usage (Slattery and Swofford, 2010). On the other side of the argument are those who oppose wind energy projects because of local externalities such as visual landscape impact and noise (Groothuis et al., 2008).

Jones and Eiser (2010) conducted a study which found that generally there was a gradual increase in positive attitudes towards development with increasing distance from sites. Contradicting this however is a recent study (Johansson and Laike, 2007) which showed no differences regarding opposing additional turbines between three groups living at varying proximities to a particular wind farm.

Wolsink (2000) showed in his paper that surveys generally show strong public support for wind farms. However projects will to a certain extent suffer from the NIMBY phenomenon. He goes on to argue that other barriers exist beyond public attitudes such as political or authoritative body institutions. The Poolbeg incinerator in Dublin is a prime example of political intervention of projects. The Wadden Union in the Netherlands is another example of how institutions can over rule public opinion regarding wind farms where their legal skills lead to many proposed wind developments being terminated.

It is from this basis, the author began to examone Irish planning documents to see why some projects were given the go ahead such as Castlepook in Co. Cork (section **2.9.1)** while others were refused planning permission such as the Sliabh Reagh development in Co. Limerick (section **2.9.2)**. Examining these cases proved interesting as both are located on the Ballyhoura mountain range. The only difference between the refused site and the developed site are the county borders where two different county councils grant planning permission to developments.

The review of the literature demonstrated a lack of clarity with regard to reasons for the slow development of wind farms. Reasons differ but also overlap between the geographical perspectives such as the United Kingdom, USA and mainland Europe. Institutional and political intervention have been found to over rule public attitudes in some cases such as the Sliabh Reagh development where the first party had the support of local communities to his wind farm development and a recommendation from an

independent party. The research objective was based on this lack of clarity. The research objective of this study is:

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

Chapter 3

Research Methodology

3.0 Research Methodology

3.1 Introduction

This chapter contains a discussion of the process that led to the choice of research methods that would be used for this particular study. Firstly the chapter restates the research objective that was developed from the introduction and literature review. The importance of clearly defining a set of research questions based on that research objective is discussed. A number of research questions that will address this research objective are then formulised in section **3.2.** Following from this the main existing research models are discussed in section **3.3.** This discussion concludes by choosing the research approach that is deemed to be most suitable for this study. Section **3.4** outlines the choice of the case study method. The data gathering tools used for the case study are also discussed in this section. The chosen research approach is not without its limitations however and these are discussed under heading **3.4** also.

The research objective is as follows:

"To determine if the NIMBY phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration"

The next section develops the research questions that will enable the meeting of this research objective.

3.2 Research Questions

The formulation of the research questions is a central step in the research process. According to Flick (1998) it is a step which essentially determines success in qualitative research but its importance tends to be underestimated in most presentations of methods. According to Yin (1994) the literature review should be viewed as a means to an end as opposed to an end in itself. In other words, having carried out an extensive review of the

literature, the researcher should be in a position to develop sharp insightful questions on the research topic. This step in the research process aims to operationalise the study and should provide the researcher with an overview of what answers the study is attempting to provide, how it will provide these answers and what findings and results will be considered as acceptable results (Adam & Healy, 2000). Yin (1994) advises that given the importance of these questions, sufficient time and patience should be allowed for this task.

The overall success of the study is heavily dependant on the formulation of concrete research questions. Decisions taken with regard to methods of collecting data and the interpretation of the data collected should be based on the research questions formulated before entering the field. The failure to clearly formulate research questions could lead to great difficulties in interpreting the research data gathered (Flick, 1998). The basic scheme used to categorise types of research questions is 'who', 'what', 'where'. 'how' and 'why' (Yin, 1994). Given that the study being carried out is exploratory in nature, the questions that are being asked are either 'how' and 'why' in nature. The research questions that have been formulated for this study based on the research objective outlined are as follows:

1. Why are there high levels of general support for wind energy and low levels of planning success?
2. How good is the term NIMBY as an explanation for the social gap that is existent between perceived support for wind power in general and low levels of planning success?

The first research question aims to find answers that will offer a better understanding of why it is difficult to erect a wind farm with no planning objections. It is hoped that the information gathered will show the nature of planning objections and controversy over wind farms being built in a local area. The second research question will address the NIMBY phenomenon to seek if it is too simplistic a catchcall to reflect the complexity of

human nature and their interaction with social institutions. Section **2.2** addressed the proximity hypothesis and shows evidence of how the NIMBY concept does not fully explain variations in public attitudes about wind farms. It is hoped that the answer to this question on the social gap will be made clearer by furthering the knowledge of NIMBYism using research within a local area affected by wind turbine erection.

3.3 Research Approaches

Creswell (2003) states that research methods and strategies used, all contribute to a research approach. Research approaches can generally be categorised as:

1. Quantitative
2. Qualitative

There are a number of contrasting features of quantitative and qualitative research. The difference between the two is rather like the difference between counting the shape and types of design of a sample of green houses as against living in them and feeling the environment (Naoum, 2007).

3.3.1 Quantitative Research

Quantitative research is 'objective' in nature (Naoum, 2007). It is defined as an inquiry into a social or human problem, based on testing a hypothesis or a theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine whether the hypothesis or the theory hold true (Creswell, 1994). Quantitative data is, therefore, not abstract, they are hard and reliable; they are measurements of tangible, countable, sensate features of the world (Bouma & Atkinson, 1995). Quantitative research is selected (Naoum, 2007) under the following circumstances.

1. When you want to find facts about a concept, a question or an attribute.
2. When you want to collect factual evidence and study the relationship between these facts in order to test a particular theory or hypothesis.

In a 'quantitative' study, the hypotheses, research questions and objectives can be better understood when they are grounded in a theoretical framework (Naoum, 2007). Creswell (1994, p. 73), defined a theory as 'a set of interrelated constructs (variables or questions), that presents a systematic view of phenomena by specifying relationships among variables, with the purpose of explaining natural phenomena. Here, the systematic view might be an argument, a discussion, or a rationale that helps explain (or predict) phenomena that occur in the world.' Naoum (2007, p. 39) states that 'one uses a theory deductively and places it towards the beginning of the plan for a study: the objective is to test or verify a theory, rather than develop it. One thus begins the study advancing a theory, collects data to test it, and reflects on whether the theory was confirmed or unconfirmed by the results in the study.'

3.3.2 Qualitative Research

Naoum (2007, p. 39) defines qualitative research as "'subjective' in nature. It emphasises meanings, experiences (often verbally described) and so on". Qualitative methods allow for the collection of a narrowly focused yet richer type of study when compared to quantitative methods (Adam & Healy, 2000). Naoum (2007, p. 42) explains that 'the placement of theory in qualitative research tends to be towards the end of the study. Therefore the end product of qualitative research will be throwing up hunches and hypotheses which can be tested more rigorously by further quantitative research'. In qualitative research the use of theory is less clear than in quantitative design because there is no standard terminology or rules about placement (Naoum, 2007). Creswell (1994) identifies some principles to observe about using a theory in the qualitative approach, these are:

1. Employ it in a manner consistent with the type of qualitative design.
2. Use it inductively so that it does not become something to test, but rather to develop and be shaped through the process of research.
3. Create a visual model of the theory as it emerges.
4. If used at the end of the study, compare and contrast it with other theories

3.3.3 Quantitative Vs. Qualitative

Bryman (1998) provides a useful list of differences between the two research strategies. Table 3.1 on the following page includes some of the important dimensions.

		Quantitative	**Qualitative**
1.	Role	Fact-finding based on evidence or records	Attitude measurement based on opinions, views and perceptions measurement
2.	Relationship between researcher and subject	Distant	Close
3.	Relationship between theory/ concepts and research	Testing/confirmation	Emergent/development
4.	Nature of data	Hard and reliable	Rich and deep

Figure 4: Differences Between Quantitative and Qualitative Research (Bryman 1998)

The above table begins with defining the roles of both types of research. Quantitative research is scientific through the use of measurement and observation. The common strategies of enquiry used under this approach include surveys and instruments that provide data of a statistical nature. Due to its scientific basis the nature of data in quantitative research is hard and reliable where there is a distant relationship between the researcher and subject matter. It can be used to confirm theories or concepts. The role of qualitative research is exploratory and attitudinal in nature where the researcher has little information or wishes to seek views and opinions of others on the subject matter. The interview technique and questionnaires are often used as strategies of enquiry for qualitative data which provide a close relationship with the researcher and subject. Qualitative research can be used to further develop theories and concepts.

3.3.4 Approach of this Study

The research will be exploratory in nature as the researcher has a limited amount of knowledge on the topic (Naoum, 2007). However, according to Flick (1998) qualitative and quantitative research should not be viewed necessarily as incompatible opposites which should not be combined. The mixed methods approach basically refers to a research approach that draws from both quantitative and qualitative methods. This approach employs methods of enquiry that facilitates the collection of data either simultaneously or sequentially in order to best understand the research problems. For example a researcher may decide to try and expand on the findings of one method by using another. This could involve starting the investigation process with a qualitative method for exploratory purposes and then using a quantitative method with a large sample to allow the researcher to generalise the results to a population (Creswell, 2003). With regard to research in the field of NIMBY's and wind turbines a variety of approaches could be desirable.

3.4 The Case Study Method

Yin (1994, p. 13) defines a case study as an empirical inquiry that *"investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident"*. The nature of the research questions are 'how' and 'why'. There are situations where 'how' and 'why' questions can be answered by a survey and/or a case study (Naoum, 2007), thus making case study combined with a survey (discussed further) a feasible research approach. The case study method is used therefore when a researcher deliberately wants to cover contextual conditions believing that such conditions may be relevant to the study. In carrying out a case study the researcher collects detailed information on a process or one or more individuals using a variety of data collection procedures (Creswell, 2003).

There are advantages and positive aspects regarding this type of research strategy. Stake (1998) points out that although case studies provide poor grounds for advancing generalisation a single case can, in some instances, establish an example of the limits of generalisation. Yin (1994) suggests that much of the prejudices against the case study strategy have been due to a lack of rigor in case study research.

Benbasat (1987) provide reasons to suggest why the case study approach is a suitable research strategy. It allows the researcher to study events that take place in a natural setting and it enables the researcher to answer the 'how' and 'why' questions, which are the questions being asked in this study. A case study is a suitable strategy for a study that focuses on society and culture whether a group or a culture (Marshall & Rossman, 1999). The research questions asked in this thesis seek answers about why there are high levels of support for wind energy in general with low levels of planning success. They also question the term NIMBY as a catchcall to those who oppose wind farm development. With this in mind it was decided that the case study would be the most favourable research strategy. Such a strategy will provide answers to the research question outlined in section **3.2** is addressed.

3.4.1 Case Selection

When selecting a case to study, Stake (1998) argues that the level of opportunity to learn provided by the case is of primary importance. This view was taken into account during the case selection process for this research. The case study chosen was that of a wind turbine that was erected in an upland area that has been recently deemed off limits for further wind farm developments by the local county council. The opportunity to collect a satisfactory amount of the required data was strengthened by the ease of access that the researcher had to the developer of the turbine. The gate keeper that was used in order to gain access to the field was the managing director of the developers firm. It was evident from the beginning that the organisation has relatively strict policies regarding confidentiality. Due to the highly competitive nature of the business environment there were clearance issues that needed to be dealt with in order to gain permission to carry out the research. Permission was sought from the company director. He granted permission on the basis that the company name would not be used and. Therefore it has been decided to call the developers XYZ Limited and instead of naming the interviewee, he will be referred to by his job title.

3.4.2 Data Collection Techniques

Having made the decision that a case study would be the strategy used to gather information that would address the research questions formulated above and chosen for a case study, the next step is to decide upon the data gathering tools that will be used (Yin, 1994).

3.4.2.1 The Interview Method

The interview method is one of the most important and most popular methods of gathering information when doing field based research in the social sciences (Arksey & Knight, 1999). It was decided that an interview would be one of the data gathering methods. A semi-structured interview took place with the managing director of company XYZ. This interview was prearranged and yielded a large amount of useful data. The

interviewee was provided with a description of the research proposal and a copy of the interview questions, so as to ensure that the interviewee had an overview of what information was being sought. The interview was conducted at the site of the turbine on 2nd August 2010.

3.4.2.2 Survey Questionnaire

Having started the investigation process with a qualitative method for analytical purposes the researcher then utilised a survey questionnaire as a quantitative method with a large sample. This allowed the researcher to generalise the results to a population as pointed out in section **3.3.4.**

Survey questionnaires have been widely used in order to find out facts, opinions and views on what is happening, who, where, how many or how much (Noaum, 2007). Almost all postal questionnaires have 'close-ended' questions that require a specific response such as 'yes' or 'no' or ranking the importance of factors (Barnett 1991). However, you need to have sufficient knowledge on the subject of your investigation in order to offer respondents a set of response categories from which they should choose the one that most represents their opinions, views, attitudes or perceptions (Naoum, 2007). This is why the interview was conducted first. The knowledge on the subject area from this helped with composing the survey questionnaire. Informal conversations, planning documents and newspaper articles also had a role in forming the questionnaire. It gave the author different views and perceptions from various backgrounds. The survey was created and sent out to a sample of fifty people. Out of fifty, forty six were returned. The survey was completed by those who are in an area exposed to a wind turbine but not directly. Please see appendices for the survey questionnaire.

3.4.2.3 Other Data Sources

Marshall and Rossman (1999) state qualitative researchers normally depend on four methods when gathering data: participation in the setting, direct observation, in depth

interviewing and analysing documents. The interview method as used for this thesis is discussed above in section **3.4.2.1.** However, use was also made of other data gathering methods. Travelling to the site of the turbine allowed for participation in the setting and observation. This proved an important method for gaining an understanding of the environment and surrounding communities that would have been affected by the erection of the turbine. For example, various photographs were taken from the surrounding communities and on the pathway to the turbine. A number of informal conversations also took place between the researcher and locals within the communities. This proved beneficial as it helped in preparing the questionnaire survey.

Researchers can supplement participant observation and interviewing by gathering and analysing documents produced in the course of everyday events or constructed specifically for the research at hand (Marshall & Rossman, 1999). Marshall and Rossman (1999) also believe that possibly the greatest strength of documents is that they are unobtrusive and nonreactive. The researcher also analysed documents such as planning applications, planning appeals, inspector's reports from the county council planning offices. Articles from local papers were also analysed. All of these proved useful as it gave the county council's view from a planning perspective, a media perspective and also contributed to forming the survey questionnaire.

3.4.3 Research Validation

The use of the variety of data gathering methods outlined in this chapter offers this study a degree of validation. Such use of different methods and sources of data is referred to as triangulation. Triangulation has been generally described as a "process of using multiple perceptions in order to clarify meaning, verifying the repeatability of an observation or interpretation" (Stake, 1998, p. 97). In more simple terms the basic idea of triangulation is that data is obtained from a wide range of different sources using a variety of methods, investigators and theories (Arksey & Knight, 1999). Ultimately the use of triangulation is perceived to enchance the validity of the case study findings (Stake, 1998). It achieves this by an element of completeness and confirmation in relation to the data gathered

(Arksey & Knight, 1999). The validity of the findings of this study is strengthened by the use of such triangulation methods. This was achieved by gathering information from multiple sources such as interviews, survey questionnaires, planning documentation, articles, informal conversations, observation and participation within the environment.

3.4.4 Limitations of the Research Approach

The research strategy chosen for this study is not without its drawbacks. The case study method has been criticised as a form of enquiry in the past (Yin, 1994). The criticism stems from the fact that although case studies are very realistic they result in a sacrifice of generalisation in the results due to the focus on a single case study (Adam & Healy, 2000). According to Yin (1994) the use of the single case study strategy does not provide a basis for scientific generalisation because it does not represent a sample or population but only a single case. Yin (1994) also noted that there is a danger that the investigator will be careless and allow ambiguous evidence or biased views to sway the direction of the findings and results. The use of triangulation methods as discussed above in section **3.4.3** will help overcome these limitations by enhancing the validity of the research findings.

3.5 Conclusion

The research objective of this study is:

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

In order to address this research objective a number of research questions were developed. After a discussion on the main research approaches it was decided that this study would be best served by the qualitative research approach. Based on this decision a case study was chosen as the strategy to carry out the research for the study. A suitable case study was selected which would provide the necessary data.

Triangulation techniques were engaged to ensure that the study explored as many avenues as were both feasible and necessary in order to eliminate generalisation associated with case studies. The overall research design offered the researcher a framework that facilitated the collection of a sufficient amount of useful data that addressed the research objective. The findings of the case study will be presented in the next chapter. Qualitative case researchers often advocate telling the story of the case (Stake, 1998). Chapter 4 will begin with a case narrative, followed by a more detailed analysis of the survey questionnaire results. Chapter 5 will provide a discussion, answer the research questions and present the research conclusion.

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

Chapter 4

Research Data Presentation

4.0 Research Data Presentation

4.1 Introduction

The use of triangulation as discussed in section **3.4.3** will help to enchance the validity of the case study findings. This was achieved by gathering information from multiple sources such as interviews, survey questionnaires, planning documentation, articles, informal conversations, observation and participation within the environment. This chapter provides a presentation of the research evidence. Section **4.2** provides a descriptive narrative of the events upon which the case study was based in order to provide the reader with an overall understanding of the case. Section **4.3** provides the background to the survey questionnaire and displays the results

4.2 XYZ Ltd.

The organisation chosen for the purpose of this case study is a wholly owned independent Irish power supply company. For reasons of confidentiality and market competitiveness, the name of the company has been changed to XYZ Ltd. The name of the interviewee is also changed to MD which is an abbreviation of his role within the company as managing director. The case study focuses on this particular company's decision to harness a wind resource available on an upland location in South East Limerick.

4.2.1 Introduction to the Case

One 2.3 MW turbine was erected and a live planning application has been submitted for permission to install a second one on the site. The area has recently been deemed off limits for further wind farm developments by the Limerick County Council. MD constructed the 99 metre turbine before the restriction came into force. He feels that the decision makes no sense. *"At the moment this is the only turbine you will see in this area. This is a shame because, since the day it was installed it has been producing clean energy for people of this community and we are connected to the national grid."*

The question is however why has this area been deemed off limits for further wind farm development? A semi structured interview (see appendices) was conducted with MD to test the research objective in proving the research objective discussed in section **3.2.** The following is a narrative of the findings from the interview.

The Importance of Wind in Securing Ireland's Energy Security

Wind is very important for securing Ireland's energy security. Ireland as an island nation, is importing vast quantities of gas, oil and coal for our energy needs. We are totally dependant on external economies to keep ourselves supplied. If there was a shortage of these fuels our economy would completely cease. Wind energy is important, but it is not the complete answer. The ideal solution is to have a combination of wind and standby generation such as hydropower. The reason for the backup generation is due to the intermittent nature of wind. If you have wind you have electricity but no wind has the opposite effect. With wind we can reduce the amount of imports we have for oil, coal and gas. MD put it simply during the interview *"you are not fully independent with wind but it is part of the solution"*.

Onshore Vs. Offshore

In Ireland we have a strange situation. The government is supporting offshore wind energy when they are not allowing all the onshore energy to be developed. *"They are trying to encourage research into offshore wind but the fact of the matter is that there are applications for onshore wind that Ireland can never accommodate because the country simply is not big enough. There is 7,000 MW of onshore wind waiting to get grid connected"*. The government is paying a huge price difference for offshore wind in order to get connected. *"It makes no sense that the offshore should be developed before all the onshore is connected which costs a lot less"*. Our national consumption is approximately 5,000 MW/hr which is the power usage at any time.

Turbine Description

The site in question has a single wind turbine with a blade diameter of 71 meters, a hub height of 64 meters and a total overall height of 99.5 meters. An underground cable had to be laid to provide grid connection for the associated works and the on site control room. As previously metioned it is a 2.3 MW turbine which operates at 10,000 Volts. It is powerful enough to power 1,800 homes given the average consumption of an Irish household. The turbine and associated works cost over €3 million to install.

Figure 5: Case Study Turbine

Site Assessment

In order to erect a turbine in county Limerick you must prove that the resource is there to harness, under the guidelines in the county development plan. This was done with a meteorological mast. Wind speed was measured over a two year period. The data taken was ten minute average data. This was analysed by specialists and compared to other data from the same period from various other sites over the past ten years. This allowed for the prediction of potential outputs.

Financing the Project

There was a considerable grant aid available for early projects during the mid nineties. There was no grant aid available for this particular project. There is a scheme that supports a project once it is operational. It guarantees the owner a certain price for the electricity produced. From MD's experience on this site an extensive amount of work and money goes in without any promise of a return before the project becomes operational. *"We had applied for planning permission on another site which wasn't successful. That is lost money and time"*. The other site was on the same ridge line but 80 meters higher up. The current site was agreed as a compromise. Below is a picture of the ridge line.

Figure 6: Case Study Ridge Line

Originally MD's plan was to install a feasible project. There are a lot of costs associated with erecting a wind turbine. *"You have to get to a scale that covers your costs and makes the project economical"*. MD wished to put in the smallest turbine as economically possible because as a developer he would not be on the same scale as Airtricity. To get the project off the ground MD needed as small a project as possible that was scaled enough to be commercially viable. Originally he considered an 850 kW turbine. Despite this, a grid connection for this is expensive and wouldn't pay. The economics of the current turbine were better than a lot of the other ones available. *"When you have a site with planning permission you should go for as good a size as possible due*

to the economies of scale." There was a bigger 3 MW turbine available but theblades were 45 meters long. This would not have been feasible given that access to the site is via country roads.

It still is expensive with one turbine because you have to build a substation and install a grid line regardless. The grid connection became more expensive because landowners looked for compensation for running cable through their land. It is never part of the provision initially. *"When you are building a private house you do not have to pay extra for to run an electricity line across somebody's land".* It is happening now that landowners group together and stand in the way of the ESB unless they are paid some form of compensation. This has a negative effect on the economic viability of a project

Authoritative Bodies & Licences

The initial body that had to be dealt with was the planning office of the Limerick county council. Then MD had to deal with the department of energy and ESB networks. *"The county council run you through a whole pile of bodies such as the Irish Aviation Authority to ensure turbines do not disrupt flight paths, heritage and ecologists for nature and wildlife. Telecom authorities are also consulted to ensure interference with signals does not occur. All of this is dealt with through the county council and ESB essentially".* Gaining planning permission was the first step to getting the project off the ground. Licences to construct a power station and sell electricity were also needed. This is certified by the Commission for Energy Regulation (CER).

Educating Local Communities

Planning permission was first sought in 1994, but was refused. Planning permission for the current site was applied for in 2003. Initially community meetings were conducted with the aim of getting locals to become supportive of the project. *"To be quite honest I am not entirely sure if it was a useful exercise because it was done for the original site which was refused permission regardless".* MD received letters of support from twelve different community groups. With that amount of support planning permission was still

not granted. Giving his thoughts based on his own experience on how locals react to change in their surroundings MD said *"the reality is, in any area there are vocal people who will kick up about things and there are others that don't"*. On the current site MD worked closely with a local community group. Through them he spoke to people who had interests on what happened with the turbine. That's how the current site came to be compromised.

Difficulty in Building New Wind Turbines

Everybody is in favour of wind energy practically because it is clean energy. However due to the location of wind turbines they are very visual and prominent. *"People see a conflict there thought they may be supportive of renewable energy, they don't want to see it on the landscape"*. MD thinks part of the problem might be people who object don't understand what the structure is doing. People don't equate the fact that if Ireland generates enough renewable energy the environment will be cleaner. However MD has come across some ironic opposition *"the amusing thing is that it seems in a lot of cases environmentalists oppose wind turbines, their reasons being the disturbance of natural habitats, wildlife and the conservation of the countryside"*.

Number of Turbines on Site

At the moment MD has applied for another turbine but that would be the maximum capacity of the site at the moment. *"This is a rural area and the ESB network is limited in capacity here which essentially makes it a weak network area. If we were beside a city or an area with a big load the network could take more."*

Biggest Obstacles

The main hurdle is getting the planning permission. Originally the planning application was sent in 1994. This was refused. The second was in 2003 and was accepted. The second obstacle was getting a grid connection. A grid connection was applied for in 2004. *"We got connected in 2009 which is an incredibly slow turn around."* Finance as previously discussed was another difficulty for the project. MD was looking for financial

aid as we hit into a time when project financing was difficult to attain. *"We got refused by an awful amount of banks but eventually managed it"*. Landowners also previously discussed obstructing the grid connection was another hurdle MD had to face. *"This could have jeopardised the entire project"*. There was a group formed to look for compensation due to the grid connection passing through their land. *"In terms of genuine arguments they hadn't a leg to stand on really but I wasn't sorry afterwards that we settled a sum with them because you like to have a certain amount of peace starters on a project in order keep those who oppose on your side"*. There was a hidden agenda with this group for getting money out of the project using invalid excuses as their genuine reasons. *"A lot of them would now admit that money was their primary concern and this is not the only case where this has happened"*.

Political or Authoritative Intervention

The county council has made things difficult for MD. South East Limerick is now banned from the development of wind energy under the Limerick County Development Plan. MD had a planning application submitted before this ban came into force. *"I was lucky but they still pursued to make things difficult. I had ordered the turbine and down payments were made for the grid connection. Despite this the planning department still continued to fight it."* MD feels that he will more than likely be refused planning permission for the second turbine though the infrastructure to accommodate it is in place. The county development plan is now opposed to wind energy in the South East Limerick area therefore the guidelines will be adhered to by the planning department. *"They changed the county development plan to oppose wind energy in this area even though there is a wind turbine already in place up here."* MD is of the opinion that the county development plan is ludicrous as it stands. The only place in favour of wind energy in county Limerick is where there is no wind energy resource. The areas that have the go ahead are flat low lying lands. One of the provisions in the county development plan is to prove you have the resource before you can go ahead with a wind energy project. *"The*

plan says you must go to the areas where there is no resource and prove that there is a resource before you apply for planning permission thus making the entire process contradictory."

The 'NIMBY' Concept

MD did not run into NIMBY's on this particular project. He does not classify the group of landowners as NIMBY's due to their agenda on seeking compensation. *"It's definitely something that happens with incinerators and landfills. People to my mind don't have that much against wind energy."* One local person who did object to the original site that was refused planning permission was an environmental engineer. That person was one of the people who agreed to the current site. MD thinks that this may have been some form of NIMBYism but not strictly. *What is ironic is that often environmentalists oppose wind farms due to landscape and scenery disruption."*

Noise Impact

Noise is either within the specification that you are allowed or it is not. Noise has to be 43 dB or less at the site boundary. This avoids any credible arguments for noise disruption so it should not be an issue in any case nowadays.

Visual Impact

MD is of the view that visual is about a balance between tourism/scenery and harnessing a resource that is available. With visual arguments there are two conflicting resources. These are the tourism/scenic resource and the industry/renewable resource.

The question is can you balance them and have the two together? There is a lot of confusion in society whether wind farms are detrimental to the tourism/scenic resource. It is the confusion wherein the problem lies. The Galtee Mountains for instance are an exceptional mountain range. *"Nobody has applied for a wind farm up there because*

anybody would accept that they would be out of place. There would be a huge conflict if turbines were installed up there". The following is a view of the Galtees near the site of the turbine.

Figure 7: Galtee Mountains

A lot of the lower mountains around the south east Limerick area are almost unnoticeable due to the Galtees on the skyline. Limerick is practically an inland county. *"Unless you are on elevated ground you will not get the resource."* MD feels that a compassionate view needs to be taken by seeking the balance between harnessing the resource while keeping the scenic views intact. The current area needs to be open for consideration in the county development plan. *"If it is carefully sited and installed within the guidelines it should be acceptable."* MD was unable to install a turbine on the top ridge of the hills. He accepts the fact that it would have been more obtrusive than the agreed site. The higher a structure is, the more it dominates a landscape.

The turbine in this case is located in what can be described as a hollow on the ridge line. The turbine is sheltered depending on what side of the hills you are on. There are some surrounding communities from where the turbine is not visible at all. The following pictures illustrate two views of the hills where the turbine is sheltered.

Figure 8: Sheltered View 1

Figure 9: Sheltered View 2

Limerick county council have gone completely safe and will only allow turbines in low lying areas so that they are not visible from surrounding areas. The problem with this is the lack of a resource in low lying areas of inland counties. However, on the other hand you do not want all areas open to development. *"In a case like this all the factors need to be considered rather than completely banning the installation of any more turbines".*

It is hard to imagine wind energy technologies ever being out of sight. It is not necessarily a good thing to consider it out of sight. *"It seems better to put a windfarm somewhere that is visible by fitting it in and making it work within the environment."* Due to the size of Ireland there is nowhere that you can say "*put all your wind turbines in here because we do not care about that particular landscape."* If you were to put wind turbines completely out of sight, it shades them from society and illustrates them as something we should be ashamed about which isn't the right approach either according to MD. It is about making people understand that wind turbines are about perception. *"When a person looks at a wind turbine they need to see something producing electricity with zero pollution and emissions."* MD feels this is the message that needs to be delivered to all people. With this perception people will not view the structures as *"a lump of metal with three rotating spikes, instead they will see something that is generating their electricity and doing good for the local environment."*

MD is of the opinion that people need to understand that every single turbine is contributing to Ireland's overall targets to become more independent in terms of energy security. Ireland could be self sufficient but the output of wind is not consistent. This is why back up generation is needed such as hydro which can work in conjunction with wind. The spirit of Ireland concept is an example of this. *"This would allow electricity generation in a controlled and steady fashion in Ireland."*

4.3 *Survey Questionnaire Background & Objectives*

The survey questionnaire served many purposes in order to meet the research objective:

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development?"

In order to do this the questionnaire had to be constructed in such a manner as to:

- Measure awareness and attitudes of wind farms.
- Assess support for building wind farms.
- Measure incidence of seeing wind farms.
- Assess knowledge of and attitudes towards wind farms and wind energy.
- Measure reaction to different wind farm layouts/sizes effects of landscape.
- Compare reaction to wind farms with other utility structures.
- Test support for development of wind energy technologies.

4.3.1 Questionnaire Construction

Please see appendices for a copy of the survey questionnaire. The first measurement was to determine the awareness and incidence of people seeing wind farms, be it through the media or by passing a wind farm. This is all covered in questions 1 to 4 of the survey.

Once this was determined question 5 was to verify if the sample thought the generation of energy from land based wind farms was advantageous or not. This gives an insight into how knowledgeable the sample are to wind energy.

Question 6 determines whether the sample are willing to pay more for renewable energy technologies over thermal generation for the sake of climate change. This question could test people's attitudes to wind energy technologies.

"The thing that affects ordinary person is how cheap the electricity is."

Interview with MD 2-8-2010

The researcher felt it was appropriate following this question to ask the sample about Ireland's natural gas reserves. This was to determine whether they wished to see thermal generation fuels such as gas exploited or to build more wind farms.

The acceptance of wind energy is generally high but developments are often opposed. This was the basis for question 8a. The sample was asked directly how favorable or unfavorable they would be to the development of a wind farm in their locality. A researcher needs to have sufficient knowledge on the subject of the investigation in order to offer respondents a set of response categories from which they should choose the one that most represents their opinions, views, attitudes or perceptions (Naoum, 2007). Question 8b and 8c offer the respondents response categories to choose from whether they are favourable or unfavourable. These responses were created using general knowledge on the subject area and other data sources such as journals, articles and informal conversations.

Jones and Eiser (2010) found generally there was a gradual increase in positive attitudes towards the development of wind farms with increasing distance from sites identified. However MD pointed out in the interview that wind energy is not necessarily a good thing to consider out of sight as this would make society increasingly negative towards them. Question 9 addresses this by asking the sample if they would prefer to see wind turbines dispersed or concentrated in a few strategic locations.

System components of the dominant electrical utility systems such as generators, transmission lines and substations were the product of social negotiation and compromise (Sovacool 2009). With this in mind the author wanted to compare the reaction to wind farms with other utility structures such as electricity pylons and mobile phone masts to see which the sample would feel most strongly about. Question 10 poses statements and the sample are required to tell which of the utility structures applies most to the statement.

Question 11 poses a number of statements which people have made about wind farms from articles, journals, planning documents and informal conversations. The sample are required to agree or disagree with each statement. This assesses knowledge of and attitudes towards wind farms and wind energy.

Questions 12, 13, 14a and 14 b measure people's reactions to different wind farm layouts and their effects on landscape. This was done by obtaining photos of wind farms from various typical locations such as upland, coastal, inland and edge of city. The sample were asked to express whether the effect of wind farms on the landscapes was positive or negative. The author then took photos from four locations within the sample area as discussed in section **4.3.2**. Question 14a asks which local area they would least favor to having a wind farm constructed and 14b asks which they would most favor. The sample were also asked to give reasons for their choices.

Question 15 measures people's awareness and knowledge of wind technologies and their overall contribution to Ireland's generation capacity. The sample were asked how much of Ireland's energy did they think was coming from wind power using a percentage figure.

Question 16 is a repeat of question 8a. The sample were asked again how favorable or unfavorable they were to the prospect of a wind farm being built in their local area. The

reason for this was to determine if anyone had changed his/her mind on wind energy from completing the main body of the survey.

Question 17 asks if 'green energy' will provide a better quality of life in Ireland. This is the final question of the survey. It comes at a time when Irish people are being exposed to wind energy on a larger scale. ESB, Bord Gáis and Airtricity are all running advertising campaigns promoting their generation of electricity from wind through the media. This is being done frequently and the campaigns are based around 'green energy' and improving the quality of Irish life with green energy technologies. This question was to test if the media coverage is influencing opinions and to test support for 'green energy' technologies for the future.

4.3.2 Sample

Fifty surveys were sent out. Out of this fifty, forty six were returned. The sample age spread ranges from sixteen to seventy five. The surveys were completed by both male and female. The survey was conducted in Emly, Co. Tipperary. Emly is a parish situated in west Tipperary on the Tipperary- Limerick border. It is nine miles from Tipperary town and 25 miles from Limerick city.

Figure 10: Map

http://www.emly.ie/

Emly is a rural village where there is predominantly a strong farming history and background. Emly is one of the oldest centres of Christianity in Ireland. It was once an important monastic centre and up until the early middle ages, Emly was the seat of the premier diocese in the south of Ireland. Construction work in 2002 lead to archaeological remains being discovered which dated back to the monastic times in the parish. The following is a picture of the gothic church in the village which is a local heritage building.

Figure 11: Local Heritage Building

http://www.emly.ie/

Emly's geographical location makes areas of scenic beauty visible around the parish. The Galtee Mountains are visible to the south of the parish. The following is a view of the Galtees from Emly.

Figure 12: View of Galtees from Sample Area

In September 2009 Emly became the winner of Ireland's Tidiest Town. John Gormley, T.D. and Minister for the Environment, Heritage and Local Government presented four awards to Emly including the overall prize. Minister Gormley said after the awards ceremony, "*the adjudicators were extremely impressed with Emly this year and they commented that 'the pride of the inhabitants is expressed in every corner of the village'*."

Given the history of the parish of Emly, its location within areas of scenic beauty and its success in the Tidy Towns Competition, the author felt that the inhabitants of the parish would be a good sample for the purpose of this research. The most common arguments which are used to oppose the development of wind farms are present in the sample area such as impacts on landscape, local heritage areas of conservation. The selected sample should be able to test the NIMBY phenomenon and help in justifying whether it can be accounted for in relation to the slow progress of wind farm development in Ireland.

4.3.3 Results

4.3.3.1 Awareness of Wind Farms

Q.1) Have you ever seen a Windfarm?

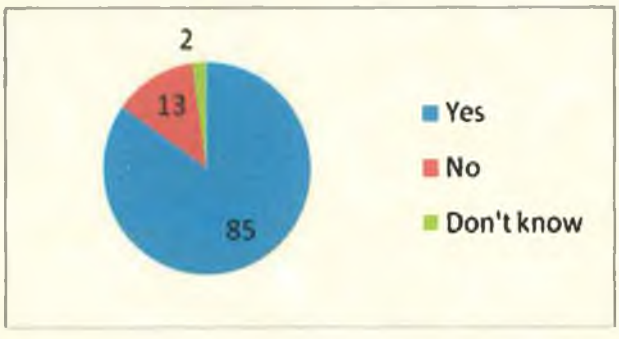

Figure 13: Windfarm Awareness Measure 1

85% of the sample have seen a windfarm; 13% have not seen one; 2% don't know if they have seen one.

Q.2) As far as you know are there any Windfarms in Ireland?

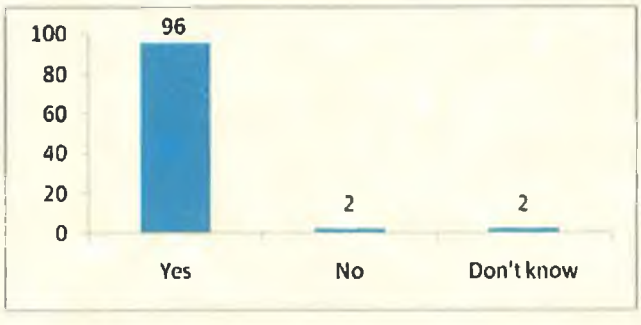

Figure 14: Windfarm Awareness Measure 2

When asked whether there are any wind farms located in Ireland today, 96% of respomdents believe there are; 2% believe there are not; 2% don't know.

Q.3) Have you ever seen a windfarm in Ireland?

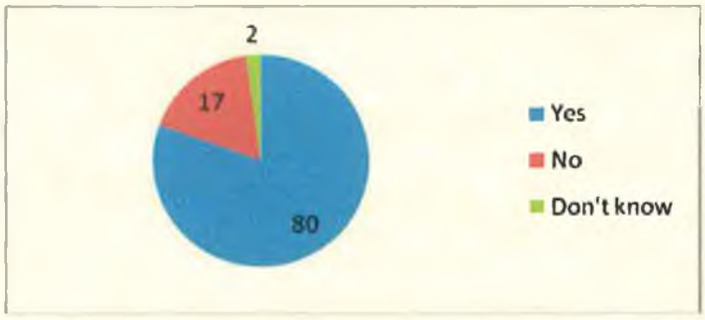

Figure 15: Windfarm Awareness Measure 3

Of the 96% who believe there are wind farms in Ireland, 80% have actually seen one hence most of the awareness comes from direct personal experience.

Q.4) Have you visited a wind farm before?

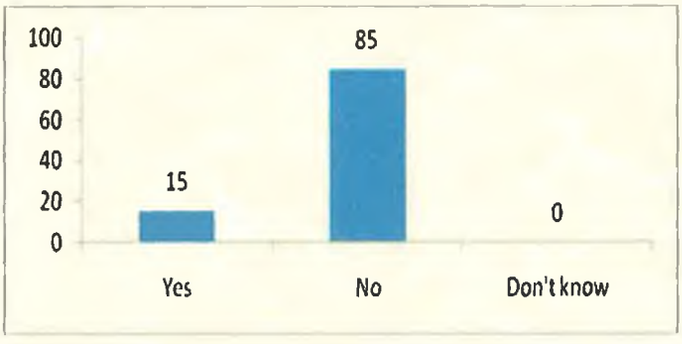

Figure 16: Windfarm Awareness Measure 4

Of the 80% who have seen a wind farm, only 15% have actually gone to a site out of personal interest. It is presumed that the rest who have seen wind farms in Ireland have done so in the distance or through advertisements.

4.3.3.2 Disposition Towards Wind Energy

Q.5) Overall, do you think the generation of energy from land based Wind farms is worthwhile?

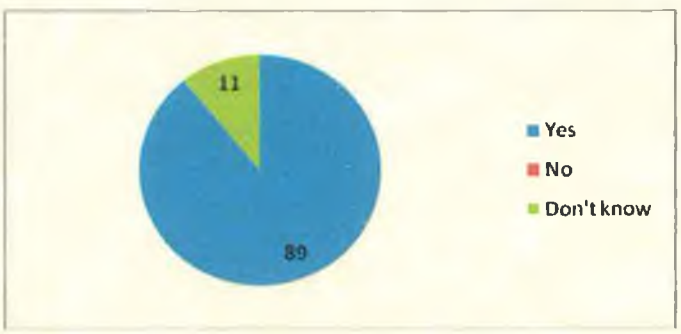

Figure 17: Attitudes to Energy Generated from Windfarms

The overall attitude to wind farms is positive, with 90% of respondents rating it as a good thing. Nobody rated it negatively while 11% did not have an opinion either way.

Q.6) Are you prepared to pay more for renewable energy as opposed to thermal generation from oil/gas for the sake of climate change?

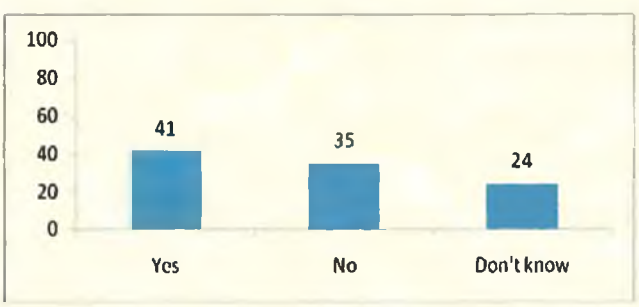

Figure 18: Renewable Energy Prices Vs. Thermal Generation Prices

41% of people are prepared to pay more for renewable energy technologies in order to help climate change. This can be interpreted as a positive reaction and suggests climate change is an issue of concern with people in rural communities that they are willing to address.

Q.7) Do you think Ireland should exploit its natural gas reserves (eg Corrib gas line) instead of building more windfarms?

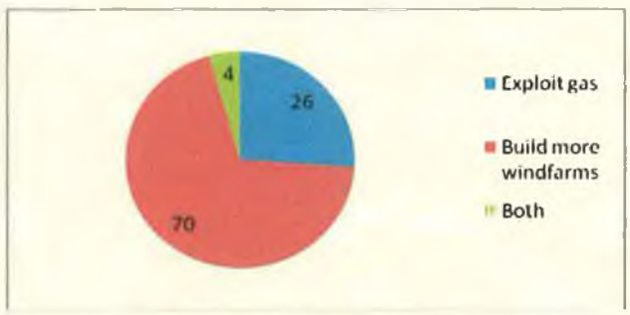

Figure 19: Build Windfarms or Exploit Gas REserves

70% of the sample wish to see more wind farms being built; 26% think that our gas reserves should be exploited; 4% are of the opinion that both should be done.

Q.8a) How favourable or unfavourable would you be to the prospect of a windfarm being built in your locality?

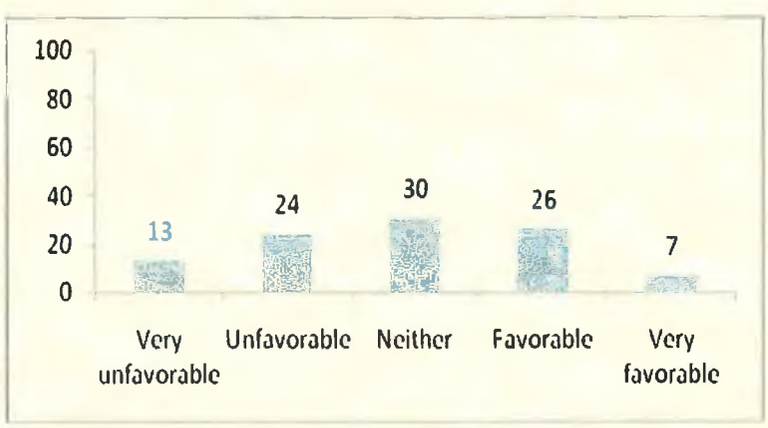

Figure 20: Local Windfarm Construction

The above figure shows whether respondents would be favourable or unfavourably disposed to a wind farm being built in their local area. A total of 37% would be unfavourably disposed; 33% would be favourably disposed and 30% express no opinion either way. This result can be looked at as somewhat encouraging if the 33% were

coupled with the neutral. This would mean almost two thirds of respondents would not have a problem having a wind farm built locally. Those expressing an opinion of the proposition of a wind farm being built in their locality were also asked for their reasons for either being favourably or unfavourably disposed to such a development.

Q.8b) Why would you be favourable to the prospect of a Windfarm being built in your locality?

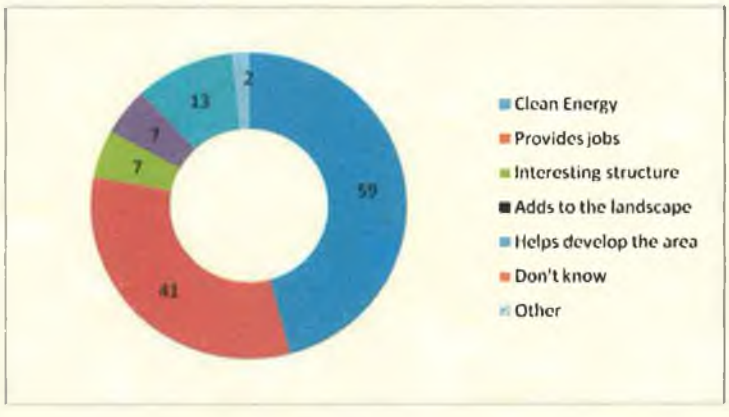

Figure 21: Positive Reactions to Windfarm Constrution

Of those who are positively disposed to a local wind farm, the main cited reason was that it produces clean energy at 59%. 41% were of the view that it would provide employment; 13% agreed that it would help develop the area which suggests that the structures themselves do not significantly contribute to negative views on wind energy; 7% were in agreement that they are an interesting structure and that they add to the landscape.

Q.8c) Why would you be unfavourable to the prospect of a windfarm being built in your locality?

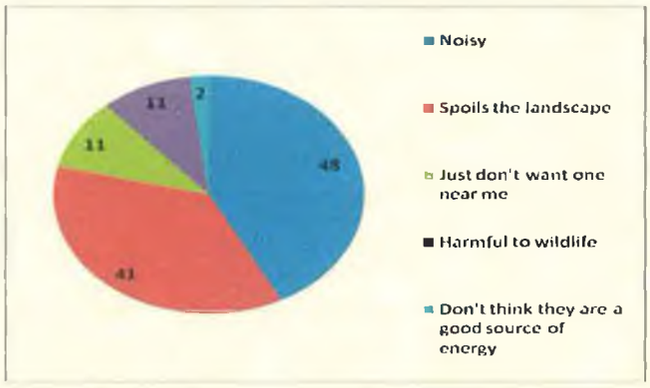

Figure 22: Negative Reactions to Windfarm Construction

Of those who are negatively disposed to a local wind farm, the main reason being noise at 48%. Realistically this should not be an issue with modern turbines as there are noise limits in relation to wind farm site boundaries. 41% believe that they spoil the landscape; 11% are of the opinion that they are harmful to wildlife; a further 11% say they just don't want one near them which could suggest that these are the true NIMBY's. 2% feel wind farms are not a good source of energy. Where negative attitudes exist towards wind farms, the visual impact of turbines on the landscape is a strong influence.

4.3.3.3 Wind Farms and the NIMBY Effect

So far the survey results suggest a generally positive attitude towards wind farm developments in the locality of respondents. However, it might occur that respondents would change their views if one was actually granted planning permission in the area. People in rural communities often don't like change to their surroundings and would prefer to see developments taking place elsewhere. The survey asked a number of questions to investigate the relative strength of the Not In My Backyard' (NIMBY) effect when applied to wind farms or to a number of other developments that could impact on the locality. This was carried out by giving a list of statements comparing wind farms, phone masts and electricity pylons. The respondents were asked to express which they felt applied most to the structures. See figures 24 to 29.

Q.9) Should wind farms be dispersed around the country or concentrated in a few strategic locations?

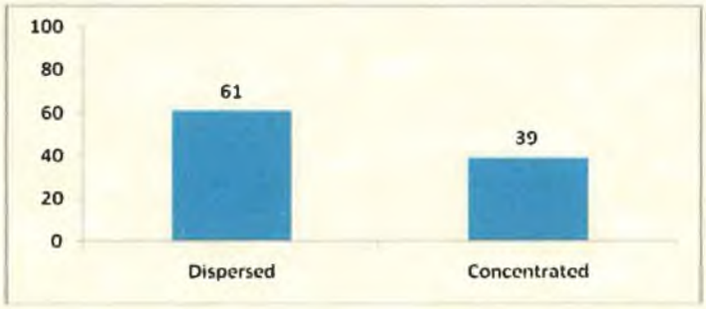

Figure 23: Windfarms Dispersed or Concentrated

The majority of respondents would prefer to see wind farms dispersed around the country. This is an encouraging result as it suggests that the majority wish to be exposed to wind farms. It is possible that they see them playing a major role for Ireland's future energy security. This coincides with MD's opinion from the interview.

"It seems better to put a windfarm somewhere that is visible by fitting it in and making it work within the environment"

Interview with MD 2-8-2010

Q.10) Looking at this list of structures, please tell me which one you think applies most to the following statements?

- It would be controversial

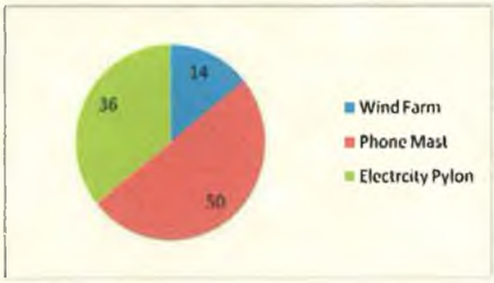

Figure 24: Utility Structure Comparison 1

- I would be unhappy if it was built nearby

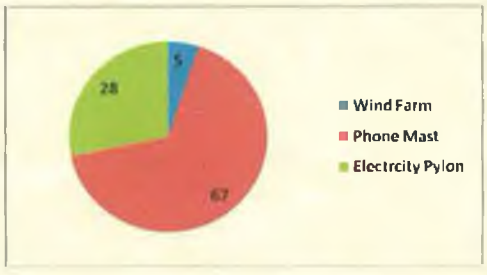

Figure 25: Utility Structure Comparison 2

- It would not have an adverse impact on local landscape

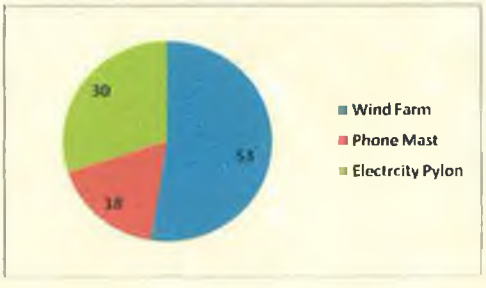

Figure 26: Utility Structure Comparison 3

- I would campaign against having it built locally

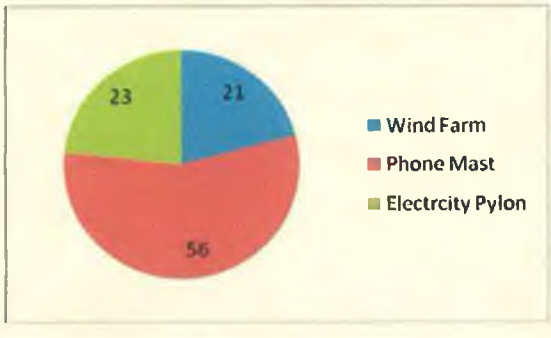

Figure 27: Utility Structure Comparison 4

- It would damage tourism in areas of scenic beauty

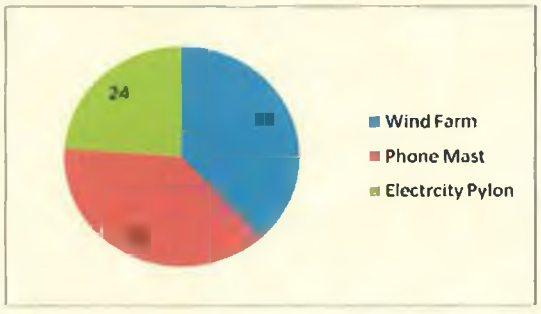

Figure 28: Utility Structure Comparison 5

- I would not be concerned if it was built nearby

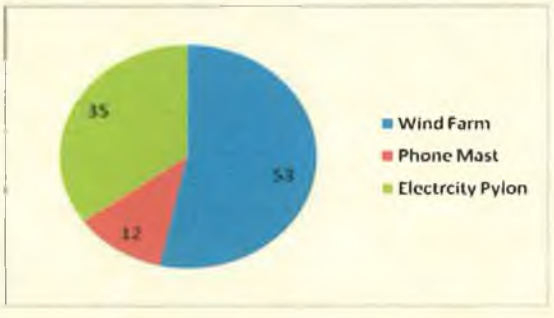

Figure 29: Utility Structure Comparison 6

As you can see from the previous graphs, in most cases it is the mobile phone masts that portray the most negative results. Wind farms appear to be the least offensive. However, there was concern expressed over local landscape and damage to tourism in areas of scenic beauty with regard to wind farms (fig 28). Overall from these statements the results are encouraging but it must be noted that the responses do indicate that there would be some local opposition to a wind farm. The erection of most structures will attract some degree of opposition, it is positive to see wind farms being placed at the favourable end of the NIMBY effect.

4.3.3.4 Economic and Environmental Effects

Q.11) The following are a number of statements people have made about Windfarms. Please tell me to what extent you agree or disagree with the following statements.

- Windfarms are a non polluting source of energy

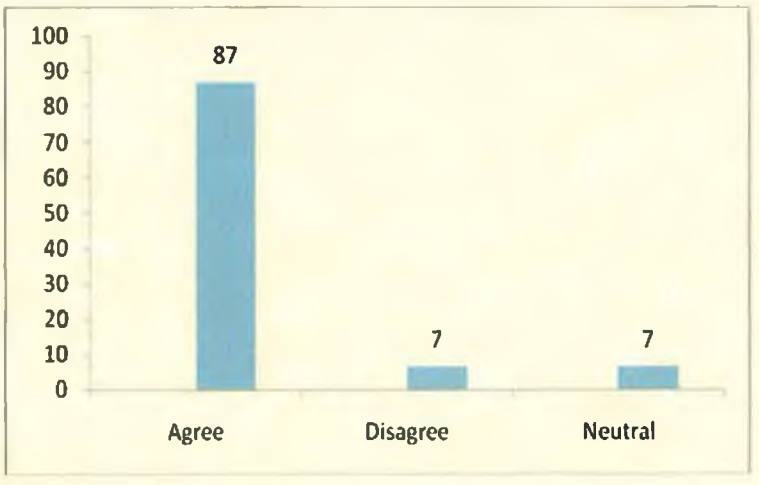

Figure 30: Statement 1

- Windfarms are a positive addition to the landscape

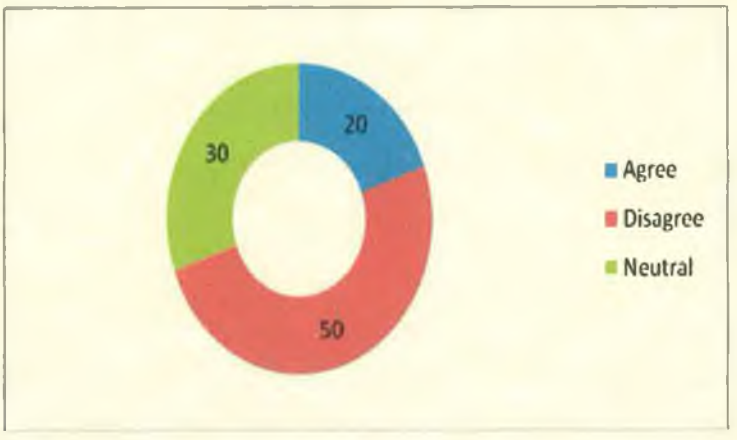

Figure 31: Statement 2

- Windfarms don't make much noise

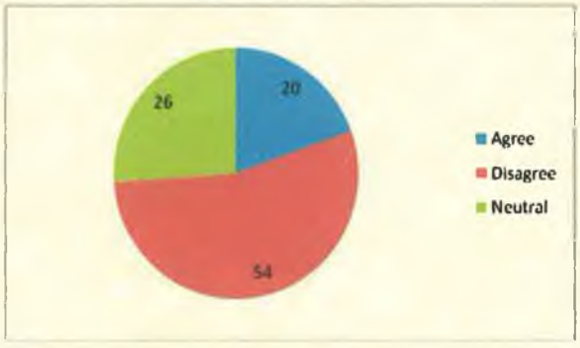

Figure 32:Statement 3

- Windfarms should not be in areas of scenic beauty

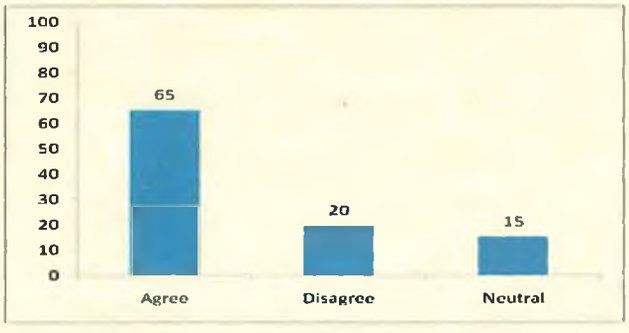

Figure 33: Statement 4

- Windfarms can make a significant contribution to Ireland's energy requirements

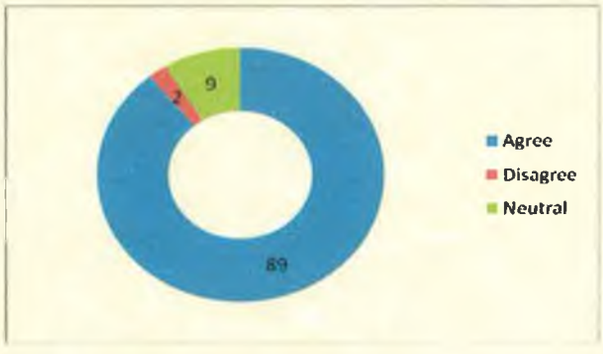

Figure 34: Statement 5

- Windfarms disturb natural habitats, birds and animals

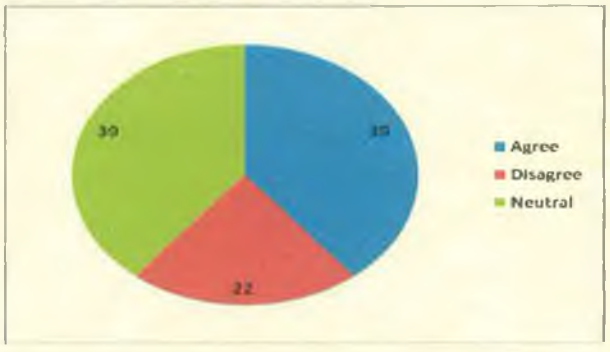

Figure 35: Statement 6

- Windpower is an efficient source of energy

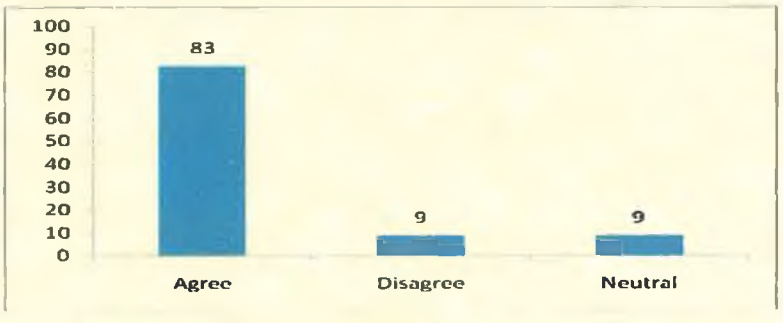

Figure 36: Statement 7

- Windfarms are an eyesore on the landscape

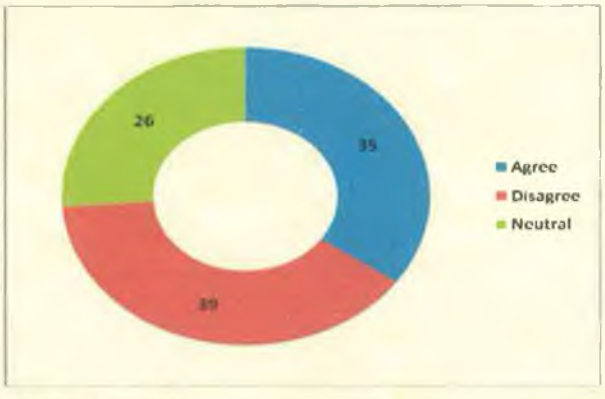

Figure 37: Statement 8

- Windfarms do not benefit local people in areas where they are built

Figure 38: Statement 9

- Wind is an unreliable source of energy

Figure 39: Statement 10

- Proximity of a Windfarm reduces residential property values

Figure 40: Statement 11

The figures for question 11 reveal that attitudes towards wind energy are influenced by perception and generalisation. 97% agree that it is a non polluting source of energy (figure 30). However, 50% are in agreement that they are not a positive addition to the landscape (figure 31).

The vast majority of respondents are of the opinion that wind farms are noisy at 54% (figure 32). This is an indication of how people's perception of something can be altered. 15% of the sample actually said they had visited a wind farm (figure 16). If this is the case why are 54% under the illusion that they are noisy. MD pointed out in the interview that noise should not be an issue due to noise restrictions at the site boundary of sites.

Generally respondents were in agreement at 65% that wind farms should not be in areas of scenic beauty (figure 33). There is a view that wind farms can meet Ireland's energy requirement's with 89% in agreement with the statement (figure 34). 39% agree that wind farms disturb natural habitats; 39% disagree; 32% have no opinion on the matter (figure 35). This shows a divided opinion which is also evident in figure 37. 35% agree that wind farms are an eyesore on the landscape; 39% disagree and 26% are neutral. The same lack of a definite opinion is revealed in relation to other areas explored such as benefits to local people.

Some contradictory answers were found from the results also. In figure 37, 39% agreed that wind farms are not an eye sore on the landscape while in figure 31 there was an agreement that they are not a positive addition to the landscape. These contradictory answers suggest a lack of direct experience of the economic or environmental impacts among respondents to wind farms. Definite opinions were expressed on wind farms regarding issues of: non polluting source of energy, not a positive addition to landscapes, damaging areas of scenic beauty, contribution to energy requirements, an efficient source of energy and decreasing property values.

There are positives and negatives that can be drawn from the results of question 11. People's perceptions are altered from what they assume and what they are told rather than what they know. Those who have some experience of the structures tend to translate into positive attitudes towards wind energy. However, the split and indefinite opinions expressed suggest that there was some uncertainty amongst the respondents regarding the economic and environmental effects of wind farms.

4.3.3.5 Effect on Irish Landscape

As an entry point into exploring apparent impact of wind farms on the landscape, interviewees were asked to indicate what landscapes they felt were suitable for wind farm development. The five landscapes were: coastal, upland, inland, urban and offshore.

Q .12) Do you think the following types of area/landscape would be suitable for the development of Windfarms or not?

- Coastal Areas

Figure 41: Landscape Suitability 1

- Upland areas/mountains

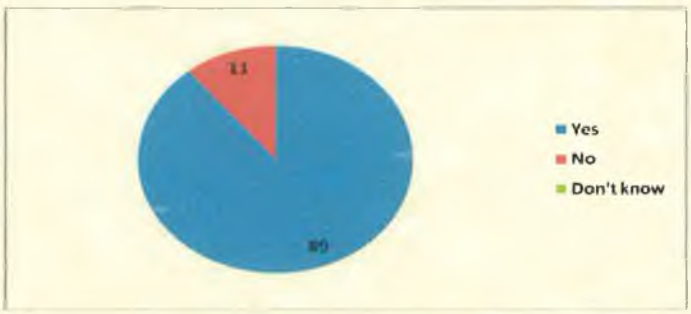

Figure 42: Landscape Suitability 2

- Inland countryside

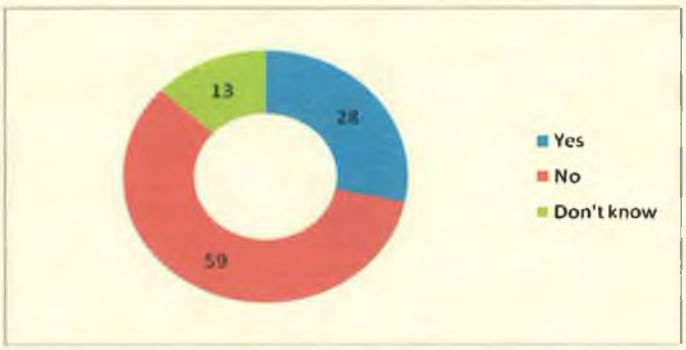

Figure 43: Landscape Suitability 3

- Areas near towns/cities

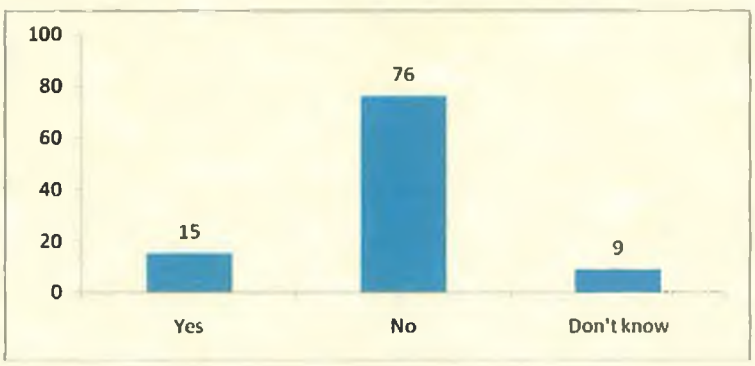

Figure 44: Landscape Suitability 4

- Off-shore

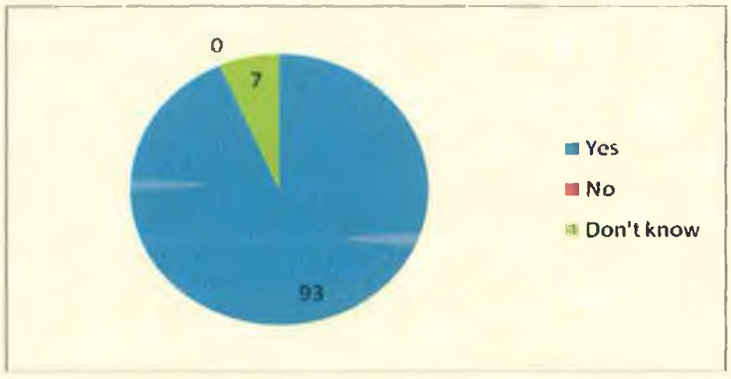

Figure 45: Landscape Suitability 5

Definite opinions were expressed on all the landscapes. 89% feel that coastal areas would be suitable for wind farm developments. 89% are also of the opinion that upland areas would be suitable. However inland and urban areas had the most negative results. 59% feel that inland would not be suitable while 76% think near urban areas is not appropriate. Offshore had the most positive reaction with 93% of the opinion that it would be suitable.

Q.13) Please look at the different landscapes and tell me to what extent you believe the windfarms has had a positive or negative effect on that landscape?

The next step of the study was to present pictures of the five previous mentioned landscapes where there has been wind farm development. This was to determine the respondent's attitude upon areas of scenic beauty. Interviewees were asked to indicate whether the impact of a wind farm on the area is positive, negative or neutral.

Figure 46: Upland Turbine

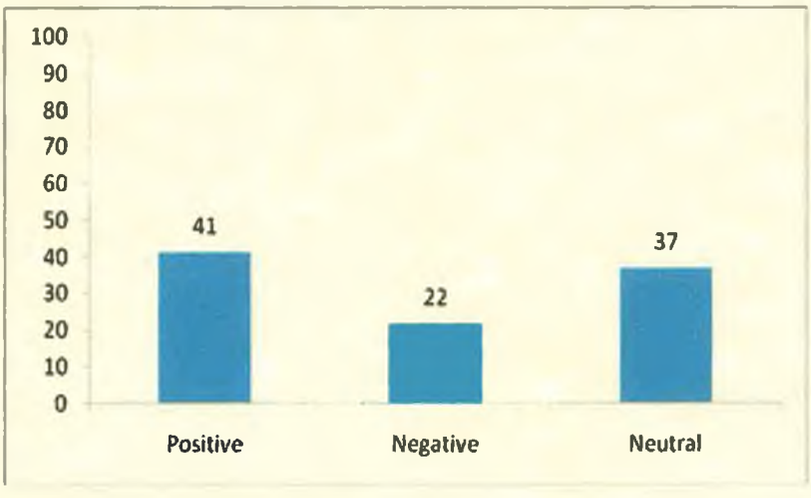

Figure 47: Upland Landscape Effect

Figure 48: Carnsore, Co. Wexford

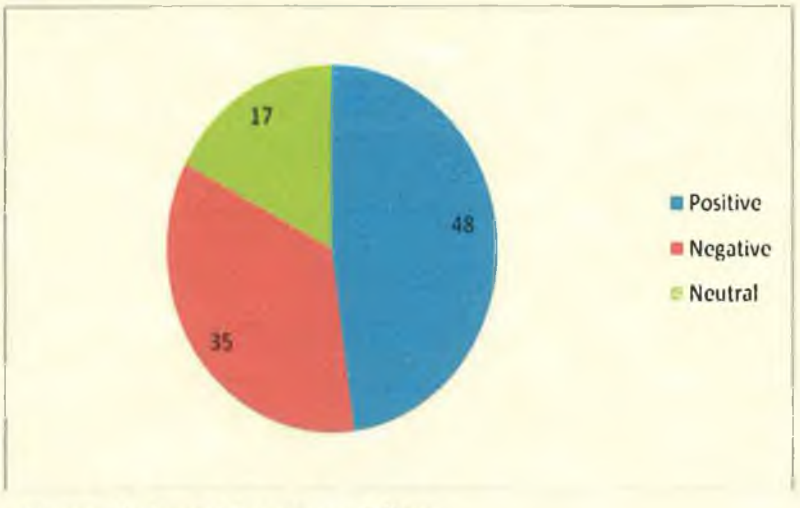

Figure 49: Coastal Landscape Effect

Figure 50: Ballywater, Co. Wexford

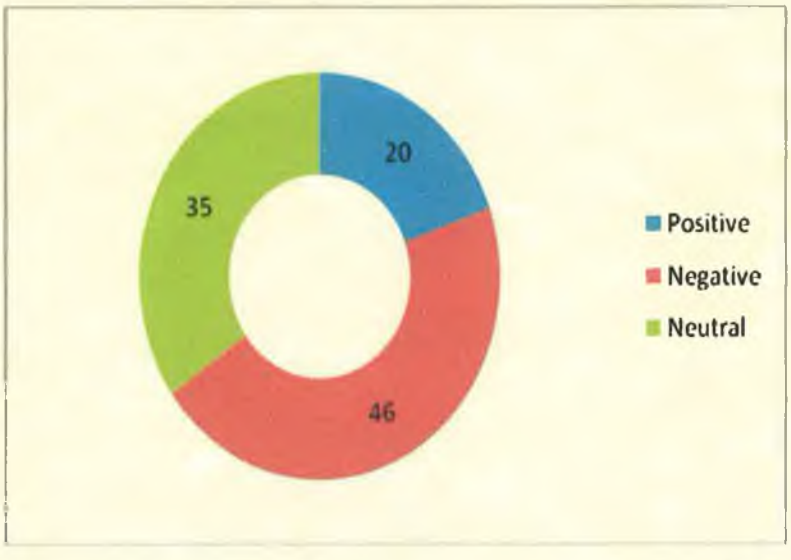

Figure 51: Inland Landscape Effect

Figure 52: Atlantic City, New Jersey, United States

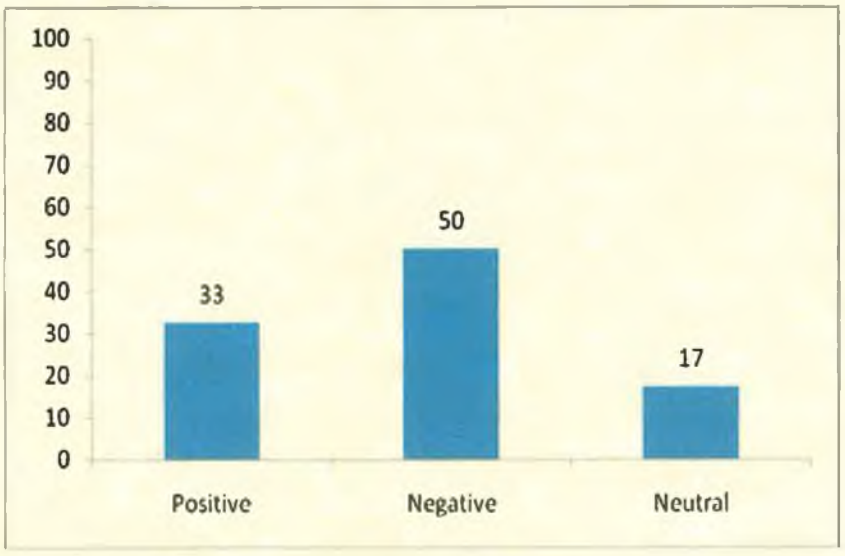

Figure 53: Edge of City Landscape Effect

These results proved interesting. Between 45% - 50% felt that wind turbines on upland and coastal areas had a positive effect on the landscape. This positive reaction matches question 12 for these landscapes. However the same can be said for the negative reaction also present in both questions. Turbines on inland countryside and areas near towns/cities had a detremental effect on the landscape according to the respondents at 46% and 50% respectively again suggesting some form of NIMBYism.

Q.14a) Which of the landscapes would you ***least favour*** as a location for windfarms giving reasons for your option?

After presenting the sample with areas around the country with wind turbines, the researcher wanted to explore the perceived impact of wind farms on local landscapes. To do this the author took photos from four locations within the sample area as discussed in section **4.3.2.** All attempts were made to get a range of different elements including scenic beauty, nature, wildlife and human development. The purpose of this was to see what influenced people's responses.

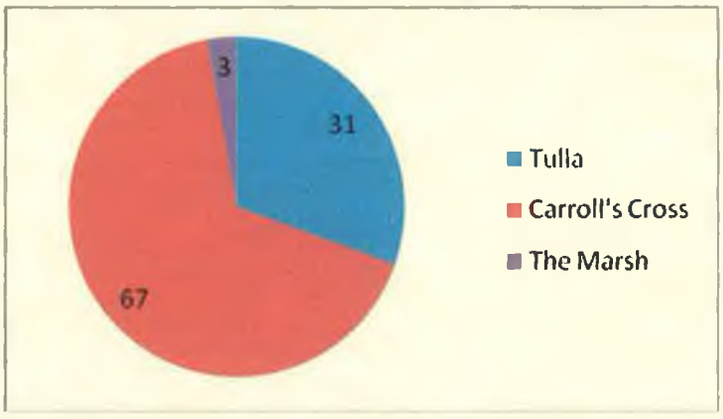

Figure 54: Least Favored Landscape

Figure 55: Tulla, Emly, Co. Tipperary

Figure 56: Carroll's Cross, Emly, Co. Tipperary

Figure 57: Bartoose Cross, Emly, Co. Tipperary

Figure 58: The Marsh, Emly, Co. Tipperary

The least favoured option from the sample area was Carroll's cross at 67%. Tulla was the second least favoured option with 31% and the Marsh came third at 2%. The following are some of the respondents reasons taken directly from the survey responses in relation to Caroll's cross:

- *"It can be easily seen from the main road and the field is backing onto a housing estate"*
- *"It would spoil the view of the land and hills in the background. It would also be very noisy for the nearby housing estate"*
- *"No need for wind farms near villages/towns/cities"*
- *"It is a nice scenic area and should not be ruined by a wind farm"*
- *"It would be noisy and impact tourism locally"*
- *"Disruptive to cattle and people in nearby housing estate"*
- *"For safety reasons it could be a distraction on the public road"*
- *"Caroll's is at the edge of the village and as an approach road entering the village it would spoil landscape"*

The following are some reasons respondent's had against a wind farm on the Tulla landscape:

- *"Tulla is a totally natural landscape with no manmade structures"*
- *"Tulla is close to my home and I think wind farms look terrible. They are also very noisy"*
- *"Tulla – spoil countryside, ugly and noisy"*

Q.14b) Which of the landscapes if any, would ***most favour*** as a location for a Windfarm giving reasons for your option?

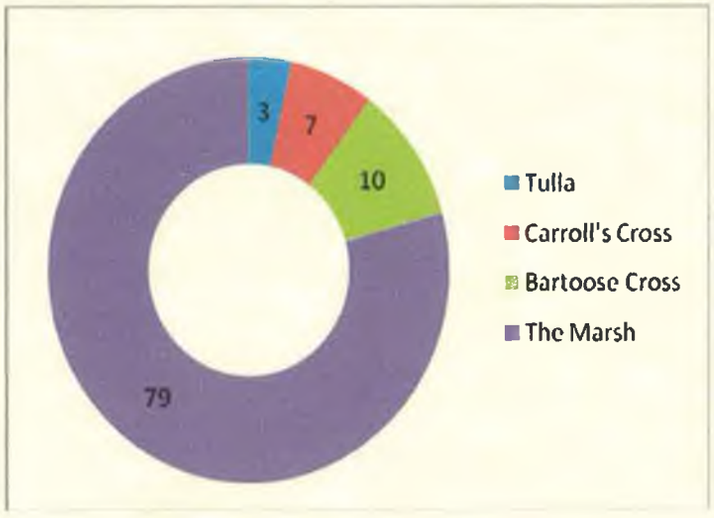

Figure 59: Most Favored Landscape

There was a strong inclination for the Marsh as a location for a wind farm. This was expected as the marsh is low lying area which is sheltered from the population of the sample area hence causing little disturbance to the respondents. Some reasons for the development at the Marsh are as follows:

- *"The Marsh is an ideal location because it is a remote low lying area"*
- *"Although it is near the village, it is not a very populated area and the land is not much good for farming"*
- *"The marsh – away from the public eye"*
- *"The land would not be of good quality for agricultural purposes"*
- *"The Marsh is not a scenic location"*
- *"Less disruptive to people and pastoral animals"*

- *"The Marsh – wind farm would be tucked away from immediate view. Better for tidy towns competition"*

4.3.3.6 Overall Attitude

Approaching the end of the survey, the respondents were asked about their overall attitude towards the construction of a wind farm in their locality. This was to see if any minds had been changed since the beginning of the survey when this question was asked (see Q.8a).

Q.16) Taking everything into consideration from this questionnaire, how favourable or unfavourable are you now to the construction of a windfarm in your locality now?

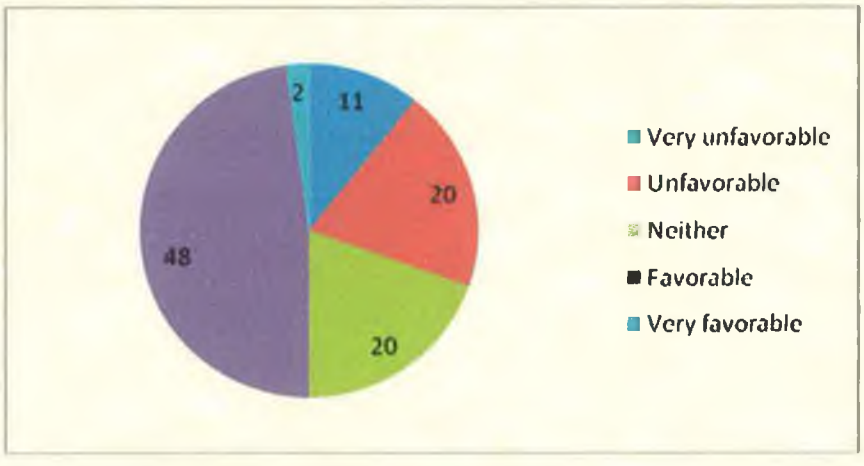

Figure 60: Local Windfarm Construction

There has been a rise in the number that would be favourable to the prospect of a wind farm within their locality. In figure 20, 37% were favourable; 33% were unfavourable; 30% had no opinion on the matter. However in figure 60, 50% were favourable; 31% were unfavourable; 20% were neutral. It would appear that those who hadn't an opinion in fig 4.8 changed it to favourable. There was also a 2% drop from those who were unfavourable to a wind farm in their locality. These changes suggest that people's opinions had slightly changed throughout the course of the survey questionnaire.

Q.17) Will 'green energy' provide a better quality of life, jobs and a cleaner environment?

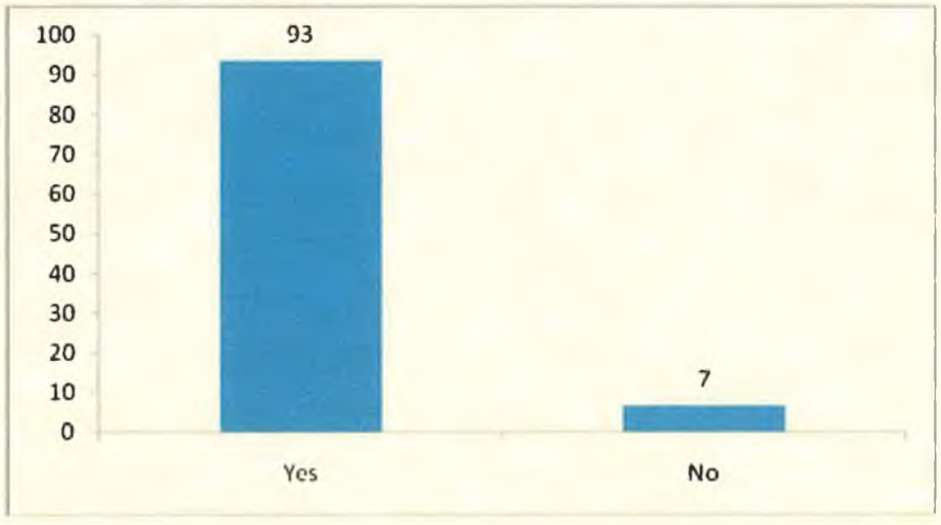

Figure 61: Green Energy to Provide a Better Quality of Life

The majority of respondents are of the opinion that green energy will provide a better quality of life and a cleaner environment. This would suggest that advertising campaigns from Airtricity, the ESB and Bord Gáis are influencing people's opinions towards wind energy and renewable energy technologies to some degree. This is good for the future as it appears to be increasing the level of acceptance to wind energy technologies.

4.4 Conclusion

It would appear that the majorty of people see wind as a desiriable source of energy. This has most likely been reinforced by the positive 'green' image campaigns by Ireland's main energy providers. Despite this, it would appear that people are not fully aware of the economic and environmental effects of wind farms.

Overall the survey results are encouraging for those who are interested in the development of wind farms. People gave a very positive reaction toward energy from wind farms. They favour wind farms over other common developments such as mobile

phone masts and electricity pylons. Few would consider that they are ready to campaign against a wind farm development.

However, it is essential at a local and practical level to educate people regarding the impacts of wind farms on their localities, environment and landscape in general. 50% of the people surveyed feel that wind farms spoil the landscape. 50% also thought wind farms were far too noisy while MD pointed out that noise shouldn't be a major concern due to restriction levels at site boundaries. People need to be reasuured on the noise issue which currently has a dominating negative perception with people. MD stated that wind farms are about perception. The task is to make people understand all the environmental and economic benefits.

A majority (65%) agreed that wind farms should not be in areas of scenic beauty. When people were asked if wind farms were an eyesore on the landscape 39% agreed that they were not. These two statistics suggest that people want a balance. They should not be in areas of scenic beauty but they are not an eyesore, depending on the landscape. If the right balance is achieved and it works within the environment as pointed out by MD, it should be acceptable.

MD did not encounter much NIMBYism on his own project. Land owners wanted compensation for running the grid connection through their land. This was solely a money matter for those involved. However, the only form of NIMBYism he came across was an environmental engineer whose arguments were landscape and scenic disruption. It is important to recognise people's legitimate concerns in order for negotiation and agreements to take place. The current site for MD was one he agreed with those who opposed the development locally. It is on the same ridge line but 80m lower, hence making it less dominant over the landscape.

Definite opinions were expressed on all the landscapes presented to the sample. It must be remembered that the sample are from a rural inland area. The most negative reaction

was given to areas near towns/cities and inland countryside. There is a possibility that this occurred because these are the most relevant to the sample. The sample area is 14 km from Tipperary town and 35 km from Limerick city. The respondents are based around inland countryside, but are in regular contact with urban areas. On the other hand the areas that got the most positive reaction were offshore and coastal. These are the furthest away from the respondents, suggesting some form of NIMBYism. When presented with pictures from local areas and asked to give their opinion on the prospect of turbines in those areas, the most positive reaction was given to most isolated area while the most negative reaction was given to the area that the sample are exposed to most often. This can be interpreted as some form of NIMBYism also.

The survey results can be considered encouraging as they do not highlight any dominant NIMBY's. MD did not experince any strong NIMBYism on his project. The biggest obstacles he faced were gaining planning permission, time spent getting a grid connection and dealing with members of the county council who made life difficult for him. After receiving planning permission the local county council updated their development plan to oppose wind developments in the area. This appears to be a step backwards. The plan has also been updated to promote wind energy in flat low lying areas in the county, essentially where there is no resource. This is also contradictory. It would seem in this case that authorative bodies were the cause of slow development and not NIMBY's.

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

Chapter 5

Discussion & Conclusions

5.0 Discussion & Conclusions

5.1 Introduction

There was a general consensus found in the literature review that the acceptance of wind energy is generally high but developments are often opposed. However, the use of NIMBY has been criticised on the basis that it is too simplistic a term to reflect complex human motives and their interaction between social and political institutions (Bel et. Al, 2006). Sovocool (2009) found the rejection of renewable energy systems in the United States could be due to socio-technical impediments. Socio-technical encompasses the technological, social, political, regulatory and cultural aspects of a society. If this is the case then NIMBY's should not be completely blamed for the slow development of wind energy but should be considered as one of several contributing factors. This chapter aims to present and analyse the research findings from the case study and survey questionnaire in order to provide a link between those findings and the theoretical arguments made in the literature review.

The analysis of the research evidence will follow the structure of the research questions and ultimately address the research objective as outlined in chapter two. It is deemed beneficial at this stage to briefly revisit the research objective and recap on the research questions. The review of the literature uncovered a need for further research in the area of the NIMBY phenomenon in order to determine if it explains the slow progress of windfarm development. The research objective of this study grew out of this need and is to provide a rich empirical investigation of NIMBYism in the area of windfarm development. This thesis aimed to determine if NIMBYism explains the slow progress of windfarm development or do institutional factors need to be considered also? The objective of this study is:

"To determine if the NIMBY phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration"

5.2 *Restating & Answering the Research Questions*

1. Why are there high levels of general support for wind energy and low levels of planning success?

2. How good is the term NIMBY as an explanation for the social gap that is existent between perceived support for wind power in general and low levels of planning success?

The acceptance of wind energy is generally high but developments are often opposed. The most common explanation for the gap in attitudes has been the NIMBY phenomenon (Slattery & Swofford, 2010). Evidence from the survey questionnaire in chapter four does suggest that there is general support for wind energy amongst those surveyed (Figures 17, 21 & 59). MD also raised the point in the interview that *"people see a conflict even though they may be supportive of renewable energy, they just don't want to see it on the landscape."*

Several studies have demonstrated various definitions of the NIMBY concept such as Krohn & Damborg (1999) where locals object because of expected consequences such as noise and visual impact. The evidence from the survey questionnaire for this thesis found that noise and visual impact were the primary reasons why the sample would be unfavourable to a wind farm being built in their loicality (Figure 22).

Wolsink (2007) suggests that people have positive attitudes towards something until confronted with it and then they oppose it for selfish reasons. This was experienced by MD of XYZ Ltd. A group of landowners obstructed the grid connection on his project. The group was formed to seek compensation because the grid connection was passing through their land. This could have *"jeopardised the entire project."* according to MD.

Dear (1992) refers to NIMBY as the protectionist attitudes of community groups facing an unwelcome development. This is demonstrated in the Cape Wind offshore development on the south east coast of Cape Cod. Members of a local tribe argue that the project would interfere with sacred rituals and long submerged tribal burial grounds (Lindsay, 2010). Evidence from the case study of XYZ also reinforces Dear's definition where a local environmentalist objected to MD's original site due to landscape and scenery disruption.

It can be seen that the various studies have demonstrated definitions of the term NIMBY making the actual defintion unclear. This strengthens Bel et al's. criticism of the NIMBY phenomenon as it is too simplistic a term to reflect the complexity of human motives.

It is expected that the closer an individual is to a wind farm the greater his/her opposition towards it. This explanation is known as the proximity hypothesis (Slattery & Swofford, 2010). However, Warren et al. (2005) talks of the 'inverse NIMBY syndrome'. This is when those with windfarms in their backyard are the most supportive of the technology. There is proof in chapter 4 to suggest that this exists. MD said that he received letters of support from twelve different community groups for his original project. Despite this local level of support, planning permission was still refused. Figure 59 also presents a high level of support (50%) for the prospect of a wind farm being built in the sample area. However, it must be noted that if the sample area was actually confronted with a project, these figures may change as Wolsink (2007) pointed out in his definition of a NIMBY (section **1.1**).

As previously mentioned with reference to Sovocool's paper (2009), he indicated the institutional barriers that contribute to the slow development of renewable energy technologies. The Cape Wind project (section **2.3.1**) is a prime example of several bodies acting as obstacles to the progress of a large scale offshore development. The late Senator Edward Kennedy opposed the development as it would damage the ocean view visible from the Kennedy's compound. A local tribe as previously mentioned has sworn to take

the project to court as it impedes on ancient tribal rituals. Commercial and recreational fishermen are concerned that the construction of turbines could disturb marine ecosystems that they are dependent on for a living. The opposition that exists here comes from political, cultural, recreational and commercial institutions. It reflects different motives that various bodies can have against developments in their 'back yard'. In chapter four MD described how he met opposition from some ironic sources such as environmental engineers. The opposition was based on the disturbance of natural habitats, wildlife and conservation of the countryside. He also tells of how the Limerick county council made things difficult for his project due to the county development plan where there was a ban imposed on wind turbines in the area of his site after he submitted his planning application. This combined with the opposing bodies of Cape Wind verifies Sovocool's theory that social, regulatory, political, commercial and cultural institutions play a major role in the slow development of renewable energy technologies. This slow development can occur despite having high levels of local support as seen with MD's original development which was refused permission. Therefore it could be considered that overall public attitude is overlooked by governing institutional bodies.

Another study conducted by Slattery & Swofford (2010) explored attitudes to wind farms in Texas (section **2.3.1**). The state of Texas currently has the largest wind energy capacity in northern America at 8797 MW. Positive public attitudes were found with those who participated in the survey. It is argued in the paper that increased public participation is needed in the planning process in order to change society's perception of wind turbines on the landscape. This will play a major role in their success and development. MD highlighted in chapter 4 that wind turbines are about perception *"when a person looks at a turbine they need to see something producing electricity with zero pollution and emissions."* However, he also makes the point that a lot of effort went into educating local communities on his initial development. He received strong local support. Despite this, planning permission was still refused which made him question the usefulness of the exercise in terms of gaining planning permission.

Jones & Eiser (2010) conducted a survey in Sheffield to determine local opposition to wind energy developments (section 2.4). The study demonstrated a clear preference to offshore development. The study also indicated that an individual's backyard is defined by the extent to which it is directly visible. This could suggest why offshore wind was preferred by those surveyed given that Sheffield is geographically landlocked. Similar results were found regarding the survey for this thesis. If you examine the location of the sample area (Figure 10) it is clearly evident that it is an inland area. There was a strong preference for offshore development (Figure 45) over inland countryside and areas near towns/cities (Figure 43 & 44). The same trend followed when the sample were shown pictures of windfarms at coastal areas, inland areas and areas near towns/cities. Coastal areas had the most positive reaction (Figure 48) while inland locations and areas near towns had the most negative reactions (Figure 50 & 52). The study by Jones & Eiser (2010) generally found that there was a gradual increase in positive attitudes with increasing distance from identified sites. These results can be interpreted that as long as developments are out f sight, then they are considered acceptable. When this was mentioned to MD in the interview he did not agree. If turbines were completely out of sight from society, it would portray them as something to be ashamed about. This is where perception comes into play and reinforces the theory of altering people's perception in order to benefit wind farm development.

In section **2.5** we see Horst (2007) is of the opinion that proximity does play an important role on public attitudes towards proposed projects. The point is made in his paper that the nature and strength of this can vary depending on the local 'value' of the land. Evidence from the survey questionnaire matches this theory. The sample were presented with photos of four landscapes (Figure 54-57) from their local area. They were asked to pick which landscape they would least favour as a location for a windfarm and which landscape they would most favour. Figure 53 displays Caroll's cross as the least favoured. This was expected as it is located on the edge of the village where local 'value' is high. *"Caroll's is at the edge of the village and as an approach road entering the village it would spoil the landscape."* Figure 58 illustrates the Marsh as the most

favoured option. This also matches with Horst's theory as this area is of low local 'value'. *"It is not a very populated area and the land is not much good for farming."*

Section **2.5.1** highlights that planning success can come from specific strategies (Upreti, 2004). Managers of the ARBRE wood gasification plant in England utilised social suitability criteria when selecting a site for their new plant. They targeted Eggborough because of its mining and industrial history. Communities with this background have a better understanding of the supply and distribution of electricity and are less likely to oppose these developments. However, this is not the case in Ireland as there is no major industrial or mining history present. The interview with MD shed some light on this situation. *"Due to the size of Ireland there is nowhere that you can say put all your wind turbines here because we do not care about that particular landscape."*

Wolsink (2000) explored the slow development of wind power in section **2.6**. He found that surveys generally show strong overall public support for wind power. His small scale surveys revealed perceived disadvantages of wind energy such as noise pollution, spoiled scenery and interference with habitats. The same perceived disadvantages were found in the survey questionnaire results of chapter four with overall support for wind energy. However, in the same paper Wolsink argues that it is a common mistake to take general support for granted as the growth of wind power capacity lags behind proposed goals.

We notice how powerful institution can override proposed developments due to their legal prowess such as the Wadden Union as discussed in section **2.6.2.1**. The Wadden Union is an example of the decisive impact institutional bodies have. This suggests that institutional constraints are more important than public acceptance regarding development of windfarms. Overall acceptance for wind farms was determined from the questionnaire in chapter four and MD had strong support from community groups for his refused development, as previously mentioned. This proves that in most cases governing bodies have more of an impact on wind energy developments against general public acceptance. This is also shown in section **2.7** of this thesis regarding the Poolbeg

incinerator where there is planning permission granted but Minister John Gormley is delaying the licence required to construct a ventilation system needed for the project. It is claimed by the US firm Covanta that obtaining the licence is the biggest obstacle to starting work on the generator.

Analysing planning documents proved an interesting exercise during the research. Castlepook is located in North Cork and Sliabh Reagh is located in south east Limerick. Castlepook was granted planning permission to build a wind farm consisting of twelve turbines in 2004. Planning permission was sought but refused for three turbines at Sliabh Reagh in 2001. Both sites are located on the Ballyhoura mountain range. Two separate county councils were involved regarding these projects. Permission was granted for the development in Cork while permission was refused, appealed and refused again for the Sliabh Reagh development. What is interesting about the Sliabh Reagh development was that in the inspector's report it contains a list of local community groups who were in support of the project. The independent observer also recommended in the appeal that the project should be granted permission. Despite this, the Limerick county council refused the appeal and the development never came to fruition. This would suggest that development of wind farms in Ireland depends on how conservative local county councils are. Cork has 261.51 MW of wind generation capacity and Limerick has 84.60 MW of wind generation capacity according to figures taken from the Irish Wind Energy Association (IWEA) at www.iwea.com. This strengthens the theory that governing bodies such as county councils have more of an impact on the progression of developments than public support. MD found this with Limerick county council who made things difficult for his turbine. *"I was lucky but they still pursued to make things difficult. I had ordered the turbine and down payments were made for the grid connection. Despite these investments the planning department still continued to fight it."*

MD made the researcher aware of the Limerick County Development Plan. Figure 2 is a map taken from the county development plan. It displays areas suitable and unsuitable for wind farm development in Limerick. On inspection it is a very conservative plan

highlighting the majority of upland areas as being unsuitable for wind farms. Section **2.8.3.1** and **2.8.3.2** deal with the reasons why these areas are deemed suitable or unsuitable under the county development plan. When asked about his experience with the Limerick county council after the turbine was installed MD stated *"they changed the county development plan to oppose wind energy in this area even though there is a turbine already in place up here."* This cannot be considered a forward way of thinking and questions Limerick County Council's policies on renewable energy. According to MD the only place in favour of wind energy in Limerick is where there is no adequate resource available (see figure 2 & 3). A provision in the county development plan is that you have to prove the resource is available in an area before you apply for planning permission. If you were to adhere to the guidelines in the Limerick County Development you will find the entire process is somewhat contradictory. Limerick is an inland county and *"unless you are on elevated ground you will not get the resource."* It is considered reasonable to say that all areas should not be open to wind energy development. However, all factors need to be taken into consideration and some open mindedness is also needed in siting wind farms in Ireland. It is obvious in county Limerick that there is much emphasis on conservation of the countryside. While this is praise worthy, the Limerick County Development Plan is rather narrow focused and contradictory with regards their wind energy policies. For counties like Limerick, a more compassionate view needs to be taken in order to harness the resource and keep scenic views intact.

5.3 Conclusions

The findings of this piece of research support the findings of previous authors who concluded that there is overall public support for wind power, yet growth in capacity lags behind proposed goals (Wolsink, 2000; Jones & Eiser, 2010; Sovacool, 2009). The case study in chapter four did not find any strong evidence of NIMBYism and showed strong local support as discussed with MD of XYZ Ltd. The survey questionnaire also showed general support for windfarms. However, the positive attitudes of those surveyed could change if they were confronted with a wind farm development in their locality as

Wolsink found (2007). Rural communities often derive their sense of identity from their surrounding landscape which can be an incentive to oppose developments (Horst, 2007). Results from the survey questionnaire do indicate that respondents would prefer to have turbines out of sight or developed on invaluable land. Coastal areas had the most positive reaction to development. When the respondents were prompted with pictures of local landscapes they also had a strong inclination towards an area out of sight and of low agricultural value. This portrays a somewhat negative perception on wind turbines. The sample were misinformed that wind farms are noisy. The reality is that there are noise level restrictions which have to met at site boundaries in order to eliminate public disturbance. Public perception could be changed by utilising advertising campaigns to alter how the public perceive wind turbines.

The NIMBY phenomenon has been slated on the grounds that it is too simple a term to encompass a broad range of intricate human motives from various institutional bodies when opposing developments (Bell et al., 2005). The research from the literature review has shown this broad range of motives from an array of institutional bodies. Examples of these are Cape Wind, the Poolbeg incinerator, Castlepook wind farm, Sliabh Reagh wind farm and the Waddensea Wetland. Despite this, regarding the case study from chapter four, the Limerick county council appeared to be the only governing body that stood as an obstacle to MD's developments. With regard to his development that was refused planning permission, strong local support was over ruled by the intervention of the county council. Planning permission was granted for his current turbine but the county council did its utmost to intervene and halt the development. The only apparent motive was conservation of the countryside. The Limerick County Development Plan clearly illustrates its strategy on the development of wind energy. This is to allow development in flat low lying areas and to prevent development in upland areas. This is laudable from a conservation point of view but lacking in forward planning in terms of renewable energy policies. There should be an allowance made for some form of compromise in upland areas rather than banning development completely. Cork County Council are an

example of a more liberal institution and figures from the IWEA show their wind generation capacity far exceeds that of Limerick's.

In conclusion, it has been proved that there is general public support for wind energy. Efforts still need to be made to alter how the general public view wind farms and other renewable energy technologies. The benefits over thermal electricity generation need to be publicized at a greater level. For instance, a large percentage of the Irish public are unaware of how dependent Ireland is on foreign economies for our energy fuels. Despite a general public acceptance for wind energy, it has been found that public opinion is often over ruled by powerful institutional bodies. These can consist of social, political, regulatory, environmental or cultural institutions where motives to oppose developments vary depending on the institution. This is a major contributing factor to the slow development of wind farms. The term NIMBY is too simplistic and incomplete to reflect the wide variety of reasons as to why the public or the previously mentioned governing bodies may oppose particular developments.

5.4 Limitations of the Research Findings

The case study approach was adopted because it facilitated the investigation and explanation of particular issues of interest in their natural setting based on the research questions (Benbasat, 1987). For this reason the case study was deemed to be a suitable approach to undertake the research objectives and questions. However, it must be recognised that the findings of a single case study approach has limitations. Other cases mentioned were part of the literature survey and do not represent the authors own field research. This study has been limited to one wind farm development in one county with one particular company. The problem with this strategy is that the occurrences found with one developer may differ from those of another. The single case study does not provide a scientific basis for generalisation of the findings and results because it does not represent a sample or population (Yin, 1994). However, the findings of the case study did provide valid support to some of the theoretical arguments posed in the literature review. In order

to enhance the validity of the case study findings a survey questionnaire was used. The questionnaire helped support more theoretical arguments from the literature survey and helped in generalising findings from the case study. MD of XYZ Ltd was sensitive to certain issues concerning his development. This made the research slightly more difficult. In general, MD was forthcoming with information but unfortunately there were certain pieces of information that he was unable to make available due to confidentiality policies. However, the level of data provided from the case study and survey questionnaire was certainly sufficient to analyse the research questions and ultimately address the research objective of this study.

"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration?"

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6.0 References

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"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration"

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Appendices

7.0 Appendices

Appendix 1	Sample Survey
Appendix 2	Cd-Rom of Completed Surveys
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"To determine if the 'NIMBY' phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration"

Appendix 1

Sample Survey

Questionnaire on Wind Energy

I am going to ask you some questions about wind energy and windfarms in Ireland. Windfarms are a collection of turbines (ranging from 60 to 120 metres tall) that are powered by the wind and generate electricity that is fed into the national grid.

Q.1) Have you ever seen a Windfarm?

Yes ..... ☑
No ..... ☐
Don't Know ..... ☐

Q.2) As far as you know are there any Windfarms In Ireland

Yes ..... ☑
No ..... ☐
Don't Know ..... ☐

Q.3) Have you ever seen a windfarm in Ireland?

Yes ..... ☑
No ..... ☐
Don't Know ..... ☐

Q.4) Have you visited a windfarm before?

Yes ..... ☐
No ..... ☑

Q.5) Overall, do you think the generation of energy from land based Windfarms is worthwhile?

- Yes ..... ☑
- No ..... ☐
- Don't Know ..... ☐

Q.6) Are you prepared to pay more for renewable energy as opposed to thermal generation from oil/gas for the sake of climate change?

- Yes ..... ☑
- No ..... ☐
- Don't Know ..... ☐

Q.7) Do you think Ireland should exploit its natural gas reserves (eg Corrib gas line) instead of building more windfarms?

- Exploit gas ..... ☐
- Build more windfarms ..... ☑

Q.8a) How favourable or unfavourable would you be to the prospect of a windfarm being built in your locality?

- Very unfavourable ..... ☐
- Unfavourable ..... ☐
- Neither favourable nor unfavourable ..... ☐
- Favourable ..... ☑
- Very favourable ..... ☐

Q.8b) Why would you be favourable to the prospect of a Windfarm being built in your locality (you may tick more than one box)?

- Clean Energy ..... ☑
- Provides jobs ..... ☑
- Interesting structure ..... ☐
- Adds to the landscape ..... ☐
- Helps develop the area ..... ☐
- Don't know ..... ☐
- Other (SPECIFY) Climate change / Economy

Q.8c) Why would you be unfavourable to the prospect of a windfarm being built in your locality (you may tick more than one box)?

- Noisy ..... ☐
- Spoils the landscape ..... ☐
- Just don't want one near me ..... ☐
- Harmful to wildlife. ..... ☐
- Don't think they are a good source of energy ☐
- Don't know ..... ☐
- Other (SPECIFY) Not overly pleased to see

Q.9) Should wind farms be dispersed around the country or concentrated in a few strategic locations?

- Dispersed ..... ☑
- Concentrated ..... ☐

Both

Q.10) Looking at this list of structures, please tell me which one you think applies most to the following statement?

Write '1' in box under most applicable, followed by 2,3, as appropriate

	Wind Farm	Mobile Phone Mast	Electrcity Pyon
It would be controversial	3	1	2
I would be unhappy if it was built nearby	3	1	2
It would not have an adverse impact on local landscape.	1	3	2
I would campaign against having it built locally	3	1	2
It would damage tourism in areas of scenic beauty	3	2	1
I would not be concerned if it was built nearby	1	3	2

Q.11) The following are a number of statements people have made about Windfarms. Please tell me to what extent you agree or disagree with the following statements.

	Agree	Disagree	Neutral
Windfarms are a non polluting source of energy	✓		
Windfarms are a positive addition to the landscape			✓
Windfarms don't make much noise			✓
Windfarms should not be in areas of scenic beauty		✓	
Windfarms can make a significant contribution to Ireland's energy requirements	✓		
Windfarms disturb natural habitats, birds and animals			✓
Windpower is an efficient source of energy	✓		
Windfarms are an eyesore on the landscape		✓	
Windfarms do not benefit local people in areas where they are built		✓	
Wind is an unreliable source of energy		✓	
Proximity of a Windfarm reduces residential property values			✓

Q .12) Do you think the following types of area /landscape would be suitable for the development of Windfarms or not?

	Yes	No	Don't Know
Coastal Areas	☑	☐	☐
Upland areas/mountains.	☑	☐	☐
Inland countryside	☑	☐	☐
Areas near towns/cities	☑	☐	☐
Off-shore	☑	☐	☐

Q.13) Please look at the different landscapes **(pg. 7 & 8)** and tell me to what extent you believe the Windfarms has had a positive or negative effect on that landscape?

	Positive	Negative	Neutral
Upland	☑	☐	☐
Coastal	☑	☐	☐
Inland countryside	☐	☐	☑
Edge of town/city	☑	☐	☐

Q.14a) Which of the landscapes **(pg. 9 & 10)** would you ***least favour*** as a location for Windfarms giving reasons for your option?

Please note these areas are visible from your locality

NEITHER - THOUGH BOTH ARE LOWLYING - CARROLS PASS ESPECIALLY IS EFFECTED BY ALOT OF Houses, & Reducing Capacity

Q.14b) Which of the landscapes **(pg. 9 & 10)** if any, would ***most favour*** as a location for a Windfarm giving reasons for your option?

Please note these areas are visible from your locality

AS ABOVE - NEITHER ARE VERY SUITABLE. SO REALISTICALLY I WOULDN'T THINK ITS A GREAT IDEA.

Q.15) What percentage of Ireland's energy do you think comes from wind power? Please give a percentage figure – a rough estimate will suffice.

	1	8	%

Q.16) Taking everything into consideration from this questionnaire, how favourable or unfavourable are you now to the construction of a windfarm in your locality now?

Very unfavourable	☐
Unfavourable	☐
Neither favourable nor unfavourable	☐
Favourable	☐
Very favourable	☑

Q.17) Will 'green energy' provide a better quality of life, jobs and a cleaner environment?

Yes	☑
No	☐

Question 9: Upland Landscape

Slievereagh Mountain, Kilfinnane, Co. Limerick

Question 9: Coastal Landscape

Carnsore, Co. Wexford

Question 9: Inland Landscape

Ballywater, Co. Wexford

Question 9: Edge of Town/City Landscape

Atlantic City, New Jersey, United States

Question 10 & 11: Local landscapes

Tulla, Emly

Question 10 & 11: Local landscapes

Carroll's Cross, Emly

Question 10 & 11: Local landscapes

Bartoose Cross, Emly

Question 10 & 11: Local landscapes

The Marsh, Emly

"To determine if the NIMBY phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration"

Appendix 2

Cd-Rom of Completed Surveys

"To determine if the NIMBY phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration"

Appendix 3

Interview Questions

Interview Questions

General

1. How important is wind energy for Ireland's energy security?

2. Do you think onshore generation will dominate over offshore?

3. Have you considered developing off shore wind turbines?

Slievereagh Turbine

4. Can you give me a synopsis of the Slievereagh wind turbine project in terms of size, output and grid connection?

5. How was the site assessed for wind speed?

6. How did you go about organising the erection of the wind turbine regarding financing, planning, construction, procurement and subcontractors?

7. What authoritative bodies had to be dealt with in the process? (County council, planning authorities, EPA etc)

8. What licences or permits were required?

9. Did you try to educate locals with regard erecting the turbine and how did you go about this? Did you think it was a beneficial exercise?

10. "Compared to other kinds of electricity production, a vast majority favours wind energy. It seems therefore quite puzzling why it is so hard to succeed in building new wind turbines." Do you agree with this? Can you discuss this in relation to slievereagh?

11. How many turbines had you intended to install? Why could you not install more?

12. What were the biggest obstacles with regard to erecting the turbine?

13. Has there been any political or authoritative body intervention on the slievereagh project?

NIMBY

14. Can you give me your thoughts on the 'NIMBY' concept?

15. Did you encounter any NIMBY's on this specific project?

16. If no, have you ever encountered a NIMBY?

17. Do you feel arguments such as visual landscape impact and noise are sufficiently credible to oppose wind developments?

18. "The NIMBY concept has been criticised on the grounds that it fails to reflect the complexity of human motives and their interaction with social and political institutions"
Do you feel this is true from your experience with regard to motives against your developments?

19. From your experience do you think people want contradictory things from their power technologies? An article written by Sovocool (2009) suggested that people crave inexpensive prices and minimal harm to the environment, but also want energy systems to be unobtrusive and abundant.

20. When dealing with planning authorities, as long as an off or onshore development is out of sight is it considered acceptable?

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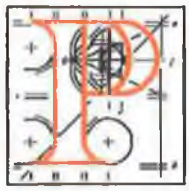
Appendix 4

Castlepook Inspector's Report

An Bord Pleanála



Inspector's Report

PL 04. 205173

DEVELOPMENT:	Windfarm incorporating 12 turbines, 50 metre anemometer mast, control building / switchyard, fencing and access at Castlepook North, Carker North, Ballyhoura, Co. Cork. An Environmental Impact Statement accompanied the planning application.

PLANNING APPLICATION

Planning Authority:	Cork County Council
Planning Authority Reg. No:	N / 03 / 2263
Applicant:	Hibernian Windpower Limited.
Application Type:	Permission
Planning Authority Decision:	Permission with conditions.

APPEAL

Appellant:	John Lyden and Tony Nagle.
Type of Appeal:	3rd Party
Observers:	(1) Mary P. Lane, (2) Thomas Lane, (3) Joseph Crone, (4) Mairead Corbett, (5) Sarah and Sally Brown, (6) Con O'Keeffe, (7) Margaret Duane, (8) Philip Kelly.
DATE OF SITE INSPECTION:	9th March 2004.
INSPECTOR:	Derek Daly

Introduction

This is a third party appeal against the decision of the Planning Authority to grant planning permission for the development.

Inspection

I inspected this site and its environs on the 9th of March 2004, during which I took photographs and these are included at the end of the report, as Appendix 1.

Site location and description

The proposed development is located in the Ballyhoura Mountains in the townlands of Castlepook North and Carker North. The Ballyhoura Mountains are located in the north County Cork and south County Limerick and the proposed development is located in close proximity to the boundary of both counties. The Ballyhouras are an upland area, which are surrounded by low undulating countryside and as a result are visible from a long distance. The upland area is quite heavily forested with various stages of the afforestation cycle ranging from mature areas to clear felled areas.

An agricultural area in which there are a number of market towns and villages including Charleville 11 kilometres to the northwest, Doneraile 9 kilometres to the south, Buttevant 10 kilometres to the southwest, Kilfinnane in county Limerick 10 kilometres to the northeast and Kilmallock also in county Limerick 13 kilometres to the north, surrounds the Ballyhouras.

The site is located in an upland area on the southwestern slopes of Little Carron, Knockacourlann and Carker Mountain and is at an elevation ranging from approximately 310 metres to 390 metres. From the site there are views over the lowlands in particular to the south, southwest and west. The northern (upper) area of the site adjoins open heath land merging down to forestry. Access to the site is via surfaced forestry roads, which in turn link into the public road network.

The local road network is of county road standard 4 to 5 metres in width. In relation to major roads the N20 Cork Limerick National Primary Route passes to the west of the Ballyhoura Mountains and passes through the towns of Buttevant and Charleville. The N73 Mallow Mitchelstown National Secondary Route passes to the south west of the Ballyhoura Mountains and the upland area is visible from these routes.

Proposed Development

The proposed development is for a wind energy project comprising

- 12 turbines a nominal rated capacity of 2.5 MW,
- Access tracks,
- 50 metre anemometer mast and
- A single storey control building / switchyard enclosed within a fenced compound.

The area of the site is indicated as 15.9239 hectares.

The turbines, which have a nominal rated capacity of 2.5 MW comprise of a steel tower up to 70 metres high, which are 4 metres wide at the base tapering to 2 metres at the top. At the top of the tower is the nacelle (hub) housing the generator and control unit and includes three rotor blades 40 metres in length made of composite fibreglass material. The structures are mounted on a concrete base.

The turbines are mainly located on a rough north to south axis extending southwards from the southern slope of Little Carron to an area identified on the O.S. maps as New Fields. There is a group of six towards the northern area of the site together with the proposed anemometer mast, three towards the west and south and the remaining three are located towards the east and south. The electrical compound is located towards the southeastern corner of the site. The turbines are located adjoining or in close proximity to existing forest roads.

The switchyard occupies an area of approximately 600 sq. metres and there is a control building and substation within the compound. The building is a single storey with a floor area of approximately 105 sq. metres. No other fencing or enclosure of lands is proposed.

Further information was submitted on the 11th of September 2003 indicating the site to be outside of the designated SAC, a survey of bird species in the area and photomontages relating to the visual impact of the development.

Environmental Impact Statement.

An Environmental Impact Statement was submitted with the application.

I have read the EIS in its entirety. The following is my summary of the main findings and mitigation measures proposed. I will discuss the adequacy of the EIS in the assessment section of this report.

Alternatives.
Section 2.9.2 describes consideration of alternative locations based on a set of screening criteria. These criteria and the favourable aspects of the site as outlined are wind resource, established and future land use, ease of access, proximity to the national grid, ease of site development, and environmental impacts

Human Beings.
The development indicates no significant impacts. There are separate headings for the consideration of noise, traffic, health and safety, and socio-economic impacts. The EIS notes the absence of dwellings in the vicinity of the development and that the phenomenon of shadow flicker will not arise.

Noise.
Noise levels were taken at two locations and established background noise levels as typical of a rural area. Predictions of noise levels were made using computer modelling and noise impacts of significance will not arise. The factors mitigating in relation to this are include the local vegetation and topography. The EIS indicates that at a distance of 500 metres noise from the turbines will be masked by ambient noise, particularly at high wind speeds.

Landscape and Visual Impacts.

In the assessment of visual impact there are maps indicating the zone of visual influence (figure 5.2), a visual impact map (figure 5.3) and defined critical areas of visibility are indicated on figure 5.4. There are also photomontages from 8 locations. These indicate that owing to the nature of the Ballyhouras and the rise from a low lying and gently undulating landscape the development will have a major impact of the immediately surrounding area.

The impact is mainly when viewed from the south, southeast and southwest. The development will be visible at a distance of 5 kilometres and from a further distance more intermittently. Doneraile will the main centre in the area with a visual impact stated as low to moderate and intermittent views occur on the major routes the area namely the N20 and N73. The forestry plantation surrounding the development will limit the impact in the immediate vicinity.

Ecology.

Fauna – birds.

The EIS indicates the Ballyhoura Mountain range is a stronghold for nesting hen harrier. A survey identified a probable nesting site immediately south of the development site. It is indicated that the location of the turbines is unlikely to pose a risk to nesting birds. The turbines are located with one exception in areas that are not of importance to nesting and only marginal foraging habitat. It is acknowledged that in the short term foraging birds could be displaced however the most valuable foraging habitats birds are unlikely to be affected by the development and the overall impact is assessed to be of minor significance.

The effects of construction works in the nesting period are considered and the potential impact arising from this can be mitigated by avoidance of works in an identified nesting area. Collisions with the turbines are also assessed and a distance of between 200 and 300 metres for avoidance is indicated. The overall impact of this is that a maximum area of 20 hectares per turbine is likely to be avoided by foraging birds in open areas. Many turbines are located in forested areas and in these locations the avoidance areas will be less. It is estimated that 40 hectares will be affected but the area will diminish as the second rotation planting matures and will be compensated when other areas in the Ballyhouras become second rotation plantation.

The loss of relatively small areas of forest would not be expected to have significant impact as these areas represent a highly modified habitat and will not impact on bird populations. The forestry area includes a range of vegetation cover from clear felled areas to mature forests and the is an ongoing development of the forests, which offers a range of habitats including second rotation pre-thicket plantation a favoured nesting location. It is considered that all species are likely to retain a presence in the area.

In mitigation turbines are located in areas, which maximise the habitat of benefit to hen harriers in established high forest, recent clear fell and a minimum of 100 metres from open bog and heath.

The area is considered a poor habitat for merlin and not suitable for supporting red grouse. Peregrines, which breed several kilometres from the site, could hunt over the site at times.

The site is not included within any Special Protection Area, proposed Natural Heritage Area or proposed Special Area of Conservation, though proposed or candidate areas are in relative close proximity.

Fauna – mammals, amphibians and reptiles.
It is not expected that the operational phase of the development will have any impact on mammals in the area and no rare, threatened or legally protected plan species occur within the site.

Flora.
Large scale conifer plantations have been established and have degraded the habitat. There will be a modest habitat removal for turbine installation and construction. The fact that most of these will be located in areas, which have been clear felled in the last few years or which are at present under conifers, significantly reduces the overall impact and no rare, threatened or legally protected plan species occur within the site. Minimum removal of vegetation is proposed and area will be left to develop naturally and some bog species are likely to become established with time.

Air quality / Climate.
There will be no emissions to atmosphere and there is no direct impact is identified locally but the overall impact of reduction of greenhouse gases nationally is referred to with the generation of electricity without emissions of CO2, SO2 and NOX.

Soils and drainage.
The development does not involve discharge to soil or watercourses or in an area of geological interest and no adverse impacts beyond the immediate construction areas. Measures to prevent pollution will be put in place during the construction phase.

Material assets.

Traffic.

It is estimated that the total number of return journeys of HGV during the construction phase is 2,700 including transporting the turbines to the site, drawing of stone, concrete and other materials and these will be oversized loads.

Tourism / Recreation.
The development will not have any adverse impacts on tourism, on any scenic route as the area is dominated by commercial forestry.

Cultural Heritage.
No archaeological sites are identified within the site and the development does not impact on any recorded features or events of historic interest. An architectural consultant will be appointed to monitor all groundworks.

General issues and interaction of Impacts.
There is no foreseen significant interaction of impacts

Additional information relating to the EIS.

Further information was submitted, which related to information submitted as part of the EIS on the 11th of September 2003 indicating the site to be outside of the designated SAC, a survey of bird species in the area and photomontages relating to the visual impact of the development.

Planning Authority Reports

The heritage officer report of the 26th of June 2003 refers to part of the site within a candidate Special Area of Conservation and modifications be made to locate the development outside of this area. The site is also under consideration as a Special Protection Area. Turbines should not be located in habitats used for nesting or forging by hen harriers and a further assessment relating to merlins should be undertaken. Reference is also made to protection of tributaries of the Awbeg River.

The Planning Report of the 3rd of July 2003 indicated the development as acceptable and requested further information requesting a revised layout with turbines outside of the candidate SAC, a survey of the impact of the development on the hen harrier and merlin species and revised photomontages.

The heritage officer report of the 13th of October 2003 refers to concern regarding the location of one turbine approximately 500 metres from a potential breeding area and given potential risk the possibility of dropping the turbine nearest this former breeding site is recommended of refusal of the development. In a further report of the 28th of October 2003 restates moving the site nearest the nest and recommends siting turbines more than 300 metres from the plantation edge and turbines should be located in compartments scheduled for felling after the windfarm's operational lifetime.

The Planning Report of the 28th of October 2003 indicated the visual impact of the development could be accepted. The development would have little impact on the human population in the area and refers to potential impacts to the hen harrier population in the area.

Other reports.

The Dept. of Local Government, Heritage and Local Government (nature conservation) in a report dated the 17th of June 2003 refers to possible designation of a Special Protection Area and that issues to be addressed include, a 500 metres wide foraging strip a breeding survey of hen harriers, surveys on foraging intensity, the impact of future second-rotation planting and the impact on merlins.

The Dept. of Local Government, Heritage and Local Government (architecture) in a report dated the 24th of June 2003 request details of the turbines.

The Dept. of Local Government, Heritage and Local Government (archaeology) in a report dated the 26th of June 2003 request monitoring of the site.

The Irish Aviation Authority indicated standard requirements relating to aviation navigation and safety.

The Southern Regional Fisheries Board had no objection in principle and recommended conditions to be included relating to prevention of pollution, control of silt deposition and stream crossings.

The heritage officer of Limerick County Council in a report refers to appropriate colours of the towers, a specified construction season and a bird monitoring programme.

The Dept. of Local Government, Heritage and Local Government (nature conservation) in a report dated the 23rd of October 2003 refers to the importance of foraging areas and refers to a minimum location of the turbines to open heath / bog with potential displacement could be avoided or minimised by siting turbines more than 300 metres from the plantation edge and turbines should be located in compartments scheduled for felling after the windfarm's operational lifetime.

Planning Authority's Decision

The Planning Authority decided to grant permission for the development, subject to 40 conditions. Apart from the standard engineering and construction conditions, the decision includes the following conditions of note: -

- Condition no. 2 requires turbines 9 to 12 to be relocated.
- Condition no. 3 relates to a management plan for tree felling.
- Condition nos. 5, 6 and 11 relate to planting / restoration
- Condition nos. 8 and 21 requires the removal of the turbines after a period of 20 years and decommissioning of the site.
- Condition no. 13 relates to an agreed specification for the turbines.
- Condition no. 17 relates to an ongoing survey of birds
- Condition no. 27 relates to recording of any bird casualties.
- Condition nos. 32 and 33 relates to noise monitoring.
- Condition nos. 34, 35, 36, 37 and 38 relate financial contributions.
- Condition nos. 39 and 40 relate to monitoring of ground conditions.

Appeal Submissions

3rd Party Appeal

The appellants in the grounds of appeal state,

- The development will have significant negative impacts on two species namely the hen harrier and the merlin, which are annex one species under the EU Birds Directive.
- The development will result in a loss of foraging habitat for hen harriers, which will be fragmented. The Ballyhoura Mountains have the highest density of hen harriers in the Republic of Ireland, the area is of national importance and is under consideration as an SPA.
- A distance of 500 metres exclusion zone from a turbine should apply rather than 250 metres as suggested by the EIS.

- Studies indicate the hen harrier will not breed within 500 metres of a turbine.
- The DOE reports refer to a minimum distance of 300 metres from the edge of the plantation area and the open heath for turbines and that the turbines should be located in felled areas or proposed felled areas.
- The hen harrier can adapt if foraging areas are available if they have the flexibility to move between different areas ranging from open areas through various stages of forestry.
- The layout of the turbines creates a 3 kilometre long barrier (T10 to T1).
- There will be a significant threat to one hen harrier nest in the vicinity of New Fields (turbine T1) and the developer has not undertaken to omit or move the turbine a safe distance from the nest.
- The general disturbance from people and vehicles visiting the site will impact on the hen harriers.
- There is a negative impact on a merlin nest site and this species is rare in County Cork. Turbines T2 and T3 are close to a nest and should be moved westwards and should only be accessed from the west
- The conditions of the permission do not incorporate all the recommendations of the Department of the Environment, Heritage and Local Government or recommendations of the Council's Heritage Officer.
- The conditions of the permission do not prevent loss of the habitat or have regard to the precautionary principle of the EU Directive.
- The precautionary principle is referred to in Objective ENV 2-10 of the Cork County Development Plan 2003 and the onus lies with the develop to show that the development will not have a negative impact on the affected bird species.

Observers

(1) Mary P. Lane in a submission indicates,
- Objects to the turbines located near her house referring to noise, visual issues and traffic.

(2) Thomas Lane in a submission indicates,
- Objects to the development referring to unsightly view, health hazard, affect on wild life, the area is of historic importance and impact on local roads.

(3) Joseph Crone in a submission indicates,
- Objects to the development referring to unsightly views, the unspoilt countryside, pollution of local rivers, the area is of historic importance and impact on local roads.

(4) Mairead Corbett in a submission indicates,
- Objects to the development referring to the visual impact on my property and affect on the value of her lands, impact on water supply, and impact on local geology.

(5) Sarah and Sally Brown in a submission indicates,
- Objects to the development referring to the visual impact on the mountains and area and the impact on local roads.

(6) Con O'Keeffe in a submission indicates,

- Objects to the development referring to risk of landslides, the visual impact on the landscape, devaluation of property and affects on the road network.

(7) Margaret Duane in a submission indicates,

- Objects to the development referring to risk of landslides, the visual impact on the landscape, affects on the road network and is the site an appropriate wind resource.

(8) Philip Kelly in a submission indicates,

- The public notice was in a remote location away from dwellings.
- The visual impact assessment is inadequate and a number of the turbines will be very imposing on the Ballyhoura landscape, which is a rich historic and literary landscape.
- The EIS inadequately addresses the issue of soil movement, risks of pollution to groundwater and noise.
- An alternative route to service the development is not responded to adequately.
- The Windfarm sites are owing to heritage designations moving away from more favourable sites to fringe areas and in turn are hugely compromising the amenity and other values.
- Other countries are reconsidering the use of hilltop locations.
- The submission includes a report with observations on vegetation, soils and hydrology.

Responses to Grounds of Appeal

The Planning Authority

The Planning Authority in a response submits comments from the heritage officer, which indicates,

- The development, which is located in an area of coniferous forest, recently felled woodland and forest tracks are of low conservation importance and although there is loss of some habitat there would be no significant impact.
- The main concern relates to the hen harrier species and the development could have a negative impact on the species the precautionary principle should be respected and that the conditions of the Dept. of Local Government, Heritage and Local Government (nature conservation) report should be included.

First Party Responses

The applicant in a response to the grounds of appeal indicates,

- Many of the issues raised were submitted in objecting to the planning application and responded to in the further information submitted to the Planning Authority.
- The turbines as proposed are not and were not within the cSAC.

- The recommendations of the Dept. of Local Government, Heritage and Local Government are included in conditions 2 and 3 of the Planning Authority's decision to grant permission.
- Foraging areas were examined at length in the EIS.
- Hen harriers move their nests.
- There are conflicting positions in the heritage officer's report and they differ to the reports of the Dept. of Local Government, Heritage and Local Government.
- The reference to the Irish Raptor Study Group submission to a Windfarm development at Sliabh Beagh is not comparable to the appeal site as Sliabh Beagh is an open landscape and the appeal site forestry blocks of different heights.
- Every application is dealt with on its own merits.
- Loss of foraging areas will be minimal and gains from second rotation areas will compensate for areas lost. There is an overall Biodiversity Plan for the Coillte lands in the Ballyhouras.
- The issue of disturbance of nesting birds by casual visitors may be overestimated. The Ballyhouras are very open as a result of forest roads and if disturbance occurs the measures indicated by the appellants could be implemented.
- The road referred for T2 and T3 is already in place and has not impacted on the existing merlin site.

The applicant in a response to the observer submissions indicate,

- It is impossible to present photomontages from every residence and a representative series was submitted. There is no evidence that windfarms devalue property.
- The water supply in the area is unaffected by the development and there are specific measures to eliminate potential impacts on watercourses.
- There is no obvious topographical or geotechnical evidence to the safe development of a wind farm on the site.
- The development will not have any significant medium or long term impact on the bird population of the area.
- There will be traffic disruption during the construction phase but not after the construction phase.
- The Ballyhoura Way walking route is not significantly affected.

Bord Pleanala request re landslides.

The applicants in a response to the request from an Bord Pleanala regarding stability of soil and landslide risks have made a submission, which indicates,

- There is no peat cover on the site and generally an insignificant depth of overburden present and there is no obvious topographical or geotechnical evidence to the safe development of a wind farm on the site.

Development Plan

The operative Development Plan is the Cork County Development Plan 2003.

The policy for wind farms is contained in Volume 1, chapter 5. Paragraphs 5.4.5 to 5.4.8. This identifies in broad strategic terms, two special areas called "Strategic Search Areas" and "Strategically Unsuitable Areas", and these are shown diagrammatically in map form. The "Strategic Search Areas" are described as areas which have both relatively high wind speed and relatively low landscape sensitivity. Developers would be encouraged generally to focus on these areas when searching for potentially suitable site.

The "Strategically Unsuitable Areas" are areas of high landscape sensitivity, which are unsuitable for wind energy projects although there may be limited potential for small-scale wind projects.

The Planning Authority have indicated that the site is not within either area though it is noted that part of the Ballyhouras is within the Strategic Search Areas designation and is considered on its own merits having regard to normal planning criteria.

The objectives for wind energy are set out in a table as INF 4-4 and INF 4-5. It is noted that there are no policies relating to maximum size or power output of wind energy projects.

The policy on Environment and Heritage is set out in Volume 1, chapter 7. Objective ENV 2-1 says it is a general objective to seek the conservation and wise management of areas of natural environmental value. There is a note on Hen Harrier Habitats in section 7.2.12, which refers to the Duchas examination of SPA's. It is also indicated that where development is proposed appropriate assessment of the risk to the hen harrier will need to be made and consultation with Duchas is advised.

Section 7.3 deals with Landscape and Visual Amenity and sets out 16 landscape types. These are shown on the Landscape Character map in Volume 4 and the subject site is in landscape type 5 "Fertile Plain and Moorland Ridge". Section 7.3.5 says that assessment of landscape sensitivity will be carried out through a Local Area Plans programme in the future.

Scenic Amenity, Views and Prospects are discussed in sections 7.3.6 to 7.3.8 and it is noted that objective ENV 3-5 says it is a particular objective to preserve the character of those views and prospects obtainable from scenic routes identified in the plan. The list of scenic routes is given in Volume 2, chapter 4 and A14, is identified on the map 2 as the most relevant to the subject site. This route is located approximately 4.5 kilometres to the east of the site.

The site is not within a designated scenic landscape and the site is not a candidate. SPA or SAC though there are such sites in the Ballyhouras and the site is in close proximity to a proposed SAC (002036).

National Policy.

It is Government Policy to promote the development of renewable energy sources. This policy is outlined in Sustainable Development – A Strategy for Ireland, 1997. Sustainable Energy policy includes maximising the efficiency of generation and

emphasising the use of renewable resources. The policy also seeks to minimise the emissions of greenhouse gases and other pollutants, both by clean generation and by sustainable consumption levels in all sectors.

The National Climate Change Strategy issued by the Dept of the Environment and Local Government in 2000 advocates expansion of renewable energy to reduce emissions and to meet commitments under the Kyoto Protocol and wind energy is identified as a means of achieving this.

The National Spatial Strategy 2002 – 2020, it states, "in economic development the environment provides a resource base that supports a wide range of activities that include agriculture, forestry, fishing, aqua-culture, mineral use, energy use, industry, services and tourism. For these activities, the aim should be to ensure that the resources are used in sustainable ways that put as much emphasis as possible on their renewability" (page 114).

National Guidelines for Wind Farm Development.

The current guidelines pertaining to wind farm development in Ireland are set out in the publication "Wind Farm Development Guidelines for Planning Authorities" by the *Department of the Environment* in September, 1996. These may be considered somewhat outdated at this stage, as the Guidelines generally relate to a smaller scale of turbines and rotors than the scale of development in 2004. The presumption, however, is in favour of wind farm development in suitable circumstances.

The Guidelines indicate

- That visual impact is among the more important considerations. Regard should be had to both the immediate visual impact and views from a distance.
- Turbines should not dominate landscape features, especially views which are designated and which it is necessary to preserve. Turbines should not be prominent when seen against an elevated skyline background from public roads, towns or village centres.
- Account should be taken of intervisibility of sites and the cumulative impact of developments.
- Noise is another important consideration. Account should be taken of the nature and character of nearby surroundings and developments. Generally noise levels measured externally at any dwellinghouse should not exceed 40 dBA.
- Rural land uses, other than housing, are generally unlikely to conflict with windfarm developments.

The Guidelines consider that the visual impact is influenced by the following: -

- Form and characteristics of the landscape;
- Design and colour;
- The existing skyline;
- Layout of turbines, and
- The number and size of turbines.

Assessment

Introduction.

In this assessment I consider the main planning issues are as follows:

- The development plan provisions,
- Visual impact,
- Impact on Fauna, specifically the hen harrier,
- Traffic
- Noise
- Landslides
- Other issues

Development Plan Provisions.

There is a positive presumption in favour of alternative energy projects in the policies of the 2003 County Development Plan and this acknowledges national policy. The plan accepts that there can be visual and environmental and other planning problems associated with wind farm developments. The County Plan 2003 encourages developers generally to focus on the "Strategic Search Areas" when searching for potentially suitable sites, though it does not confine the location of wind farms to these areas alone.

The site it appears is not within any specific designation as defined in the development plan though it is relative close proximity to a "Strategically Search Area" and as it is not within a specific designation the development can be considered on its own merits having regard to normal planning criteria. I consider that the subject site by being located in proximity a to a "Strategic Search Area" is acceptable in principle.

There is no specific scenic or other form of designation relating to the site and the nearest scenic route is over miles east of the site.

Visual Impact.

The issue of the scale visual impact is of significance in the assessment of the development and is raised by a number of the observers though it is not the issue in grounds of appeal. In addition to a general objection on visual grounds that the visual impact assessment is inadequate and a number of the turbines will be very imposing on the Ballyhoura landscape, which is a rich historic and literary landscape, the EIS is considered to be inadequate.

The visual assessment is, I consider, reasonable and I would agree with the main conclusions that the main visual impact is to the southwest, south and southeast. I consider that the photomontages are a reasonable representation of the visual impact of the proposed development and the maps indicating the zone of visual influence (figure 5.2), a visual impact map (figure 5.3) and the defined critical areas of visibility as indicated on figure 5.4 in the EIS from my visual inspection of a wider area provide a sufficient aid to the process of decision making.

The large area within the zone of visual influence reflects the topographical setting of the Ballyhoura Mountains as an upland area surrounded by relatively low lying countryside and the effect of this topography is to make the upland area visible from a considerable distance and a dominant feature of the landscape. As a consequence the development particularly to the south will equally be visible and will also be visible from the N20 and N73. Based on visual inspection the development will therefore impact on the landscape of the Ballyhoura Mountains.
The visual impact is, however a distant view particularly from the main population centres and main traffic routes and would not be I consider visually prominent. The indication that it will impact visually does not necessarily infer that the impact is a negative impact. In the context of the upland area the development will not significantly change the character of the area and the impact is less dramatic that the alteration of the upland landscape by extensive afforestation. I would agree that the centre of population most significantly impacted by the development is Doneraile and the development will be visible from Doneraile. This village is, however, approximately 9 kilometres distant from the appeal site and the development be not significantly impact on the amenity or setting of Doneraile.

The impact nearer the site is somewhat variable. The development will be visible to the south but the extensive areas of forestry on the upper slopes reduce the impact nearer the site. Dwellings in the agricultural area nearer the site particularly to the south will have clear vision of the turbines but I do not accept the contention of observers that the development given the distance from the appeal site that the development will devalue the amenities of the properties, devalue the properties or adversely affect the sale of land for sites.

In relation to the scenic route A14, which runs north from the N73 across the county boundary to the village of Ardpatrick and is generally over 5 kilometres from the site the development will be visible within County Cork but generally masked from view in County Limerick as the road passes in close proximity under the eastern side of the mountain and views of the appeal site are obscured. Where the development is visible the distance from the site is generally in excess of 5 kilometres and I do not consider that the scenic qualities are severely compromised by the development.

In general I consider that a development of the scale proposed can be accommodated on the site and overall visual impact on the area would not be significant. I do not consider that a reduction or significant relocation is necessary in the context of the site.

Fauna.

The appellants in the grounds of appeal primarily refer to the impact of the development on bird species and in particular the hen harrier species and the merlin species, which are annex one species under the EU Birds Directive. All parties to this appeal accept the significance and importance of the Ballyhoura Mountains as a habitat of the hen harrier. The potential impact of the development arose significantly in the assessment of the appeal and the reports of the Planning Authority and the reports of the Dept. of Local Government, Heritage and Local Government (nature conservation) are relevant in the assessment of this issue.

It is also noted that the appellants although indicating clearly that the development should be refused also refer to the conditions of the Planning Authority indicating that the conditions of the permission do not incorporate all the recommendations of the Department of the Environment, Heritage and Local Government or recommendations of the Council's Heritage Officer.

There are a number of issues, which arise in assessing this issue.

Interference with nesting / foraging areas.

The development is located in relative close proximity to an identified nesting site of the hen harrier, which is acknowledged by all parties. The appellants contend there will be a significant threat to one hen harrier nest in the vicinity of New Fields (turbine T1 at the south eastern end of the site) and the developer has not undertaken to omit or move the turbine a safe distance from the nest. The applicant in response indicates that the species move their nests and exclusion based on this identified site would not be reasonable. The Dept. of Local Government, Heritage and Local Government (nature conservation) reports do not focus on the issue of the nesting site and tends to focus on the foraging areas associated with the hen harrier.

In relation to foraging areas there is a large volume of material on the file relating to this. The retention of foraging areas is critical to the survival of the species and the favoured areas include open heath / bog and in forested area the second rotation young plantation. The ongoing development of a forested area with clear felling and replanting is of significant importance in the maintenance of favourable foraging areas for the species as mature forestry is not a favourable foraging habitat. In my opinion, the correspondence from Dept. of Local Government, Heritage and Local Government (nature conservation) is central to a decision on this issue.

The report of the Dept. of Local Government, Heritage and Local Government (nature conservation) dated the 23rd of October 2003 does not object to the development but refers to the importance of foraging areas and that potential displacement could be avoided or minimised by siting turbines more than 300 metres from the plantation edge and turbines should be located in compartments scheduled for felling after the windfarm's operational lifetime. The report of the heritage officer supports this position and this is further stated in a response to the grounds of appeal.

The appellants in the grounds of appeal consider that conditions of the permission do not incorporate all the recommendations of the Department of the Environment,

Heritage and Local Government or recommendations of the Council's Heritage Officer. Condition no.2 defines the 300 metres referred to and supports the Dept. of Local Government, Heritage and Local Government (nature conservation) recommendation.

The position in relation to the location of the turbines in areas scheduled for felling after the operational life of the turbines is not as clearly stated. Condition no. 3 of the Planning Authority's decision refers to a detailed management plan for the clear felling and replanting of trees related to conservation requirements of the hen harrier. This condition although not specifically stating the recommendation and requirements of the Dept. of Local Government, Heritage and Local Government (nature conservation) it does require agreement for felling and replanting of trees on the site. The condition could therefore provide for the retention of the mature forestry where retention was considered necessary for the conservation of the species. I would however consider that given the importance of taking all measure necessary to conserve the hen harrier species and other similar species that the precautionary principle should apply and the recommendation as indicated by the heritage service is included in a decision to grant planning permission.
The development will impact on the existing foraging areas but in a commercial forestry these areas are not static but subject to change and ongoing evaluation through the provision of a management plan is central to maintaining foraging areas for the hen harriers. As indicated by the appellants the hen harrier can adapt if foraging areas are available and if they have the flexibility to move between different areas ranging from open areas through various stages of forestry. On the basis of the information I consider that conditions to provide for this are required.

General disturbance associated with the development.

The appellants refer to this issue in the grounds of appeal. The disturbance referred to is during the construction phase of the development and the post construction phase. The EIS and associated documentation refer to a number of mitigation interventions to minimise the impact during the construction phase including mitigations measures during the nesting season. In relation to the post construction phase the primary concern relates to increased tourists coming into the area to view the turbines. The applicant contends that the issue of disturbance of nesting birds by casual visitors may be overestimated, that the Ballyhouras are very open as a result of forest roads and if disturbance occurs the measures indicated by the appellants could be implemented.

I consider that the development can give rise to a level of disturbance but this can be addressed by the implementation of the mitigation measures outlined in the EIS. I would also accept that some increase in visitors is likely to occur if the development proceeds. The area is, however, currently open to visitors, has a network of forestry roads, which provides access to the upper areas of the Ballyhouras and there are local initiatives such as the Ballyhoura Way to encourage tourists to come and walk in the area.

Collisions with the turbines.

The Dept. of Local Government, Heritage and Local Government (nature conservation) reports do not refer to the question of collisions. The placing of structures in a location where there were previously no structures existed raises the risk of collision but the risk is difficult to evaluate. The species forages over an area in excess of five kilometres and already indicated the area in question is a commercial forestry. On the basis if the information submitted I do not consider that the issue of potential collisions is sufficient to warrant refusal.

To conclude the development will impact on the habitat of the hen harrier and will result in the loss of some habitat. Reference is made to the precautionary principle but in an overall assessment the level of impact would not, I consider, be significant. Including conditions to provide 300 metres separation from open heath / bog does not have any implications regarding visual impact.

Merlins.
There is also reference to the potential impact of the development on the merlin species and there is reference to a nearby nesting site. The Dept. of Local Government, Heritage and Local Government (nature conservation) reports refer to the impact on the merlin and appear to indicate no significant impact.

Traffic.

Concern is raised in relation to the impacts of additional traffic movements and the consequent impact on the local road network. The EIS indicates an estimated total number of return journeys of HGV during the construction phase is 2,700 including transporting the turbines to the site, drawing of stone, concrete and other materials and these will be oversized loads.

The main traffic impact will I consider arise during the construction phase and traffic generation in the post construction phase will be very low. The Planning Authority has included conditions for financial contributions towards the restoration of the local road network after the development is constructed and this is I consider reasonable.

Noise.

The DoELG Guidelines require that generally noise levels measured externally at any dwellinghouse should not exceed 40 dBA. There are no dwellings in the vicinity of the appeal site.

The EIS indicates that noise levels were taken at two locations and established background noise levels as typical of a rural area. Predictions of noise levels were made using computer modelling and noise impacts of significance will not arise. The factors mitigating in relation to this are include the local vegetation and topography. The EIS indicates that at a distance of 500 metres noise from the turbines will be masked by ambient noise, particularly at high wind speeds.

On the basis of the information provided in the EIS I consider that the proposed development is acceptable in terms of noise impact.

Landslides.

The issue of the potential concern in relation to landslides arise in submissions of observers. An Bord Pleanala requested a report by a qualified hydrogeologist or qualified engineer with expertise in soil mechanics re landslides regarding stability of soil and landslide risks. The report received on the 11th of February 2004 concludes there is no peat cover on the site and generally an insignificant depth of overburden present and there is no obvious topographical or geotechnical evidence to the safe development of a wind farm on the site.

Other issues.

Drainage / watercourses.
There are no streams on the site and the EIS refers to mitigation measures to prevent pollution. I also note that the Southern Regional Fisheries Board has no objection in principle and recommended conditions to be included relating to prevention of pollution, control of silt deposition and stream crossings.

Cultural Heritage.
No archaeological sites are identified within the site and the development does not impact on any recorded features or events of historic interest. I consider that the development is acceptable from an archaeological viewpoint subject to conditions.

Summary and Recommendation.

Summary.

I consider that the revised proposal for 12 turbines is consistent with the policies for alternative energy projects, and, being in close proximity a to a "Strategic Search Area", with the policies and objectives for wind farm developments in the Cork County Development Plan 2003. The development is also consistent with national policies in relation to the development of renewable sources of energy.

Any development providing for structures up to 70 metres in height and with rotor blades of 40 metres will create a visual impact but the development is acceptable on grounds of visual impact taking into consideration as the main impact is distant views and any relocation within the site is of no benefit in this regard.

Taking account of the correspondence from the Dept. of Local Government, Heritage and Local Government (nature conservation) the proposed development will not impact significantly on the habitat of the Hen Harrier species. The impact on the merlin species is also indicated as not being significant.

In relation to potential impact in relation to noise, the proposal is acceptable.

Recommendation.

Having regard to national policy, the provisions of the County Development Plan, the decision of the planning authority, the grounds of appeal, my site inspection of the site and general area and my examination of the planning issues in this case, I consider that the proposed development of 12 turbines would be consistent with the proper

planning and sustainable development of the area. I would therefore recommend that permission be granted.

Reasons and considerations

Having regard to –

(a) National policy regarding the development of alternative and indigenous energy sources and the minimisation of emissions of greenhouses gases,

(b) The guidelines issued by the Department of Environment and Local Government in 1996 on Windfarm Development,

(c) The provisions of the current Cork County Development Plan, and

(d) The nature of the landscape in the area,

It is considered that, subject to compliance with the conditions set out, the development of wind turbines and associated works at this location would not have a significant adverse impact on the landscape, would not adversely impact on flora and fauna, would not seriously injure the amenities of the area or of property in the vicinity and would be in accordance with the proper planning and sustainable development of the area.

Conditions

1. The development shall be carried out in accordance with the plans and particulars lodged with the application as amended by revised particulars received by the Planning Authority on the 14th of May 2003 and the 11th of September 2003, except as may otherwise be required in order to comply with the following conditions.

   Reason: In the interest of clarity.

2 The structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development unless planning permission for a further period shall have been granted.

Reason: To enable the planning authority to review the operation of the wind farm in the light of circumstances then prevailing.

3 (a)The wind turbines shall be finished externally to a colour scheme to be agreed with the Planning Authority before development commences. Cables from the turbines to the substation shall be located underground. All wind turbines shall be geared to ensure that the blades rotate in the same direction.

(b) Prior to commencement of development the applicant shall submit to the Planning Authority for written agreement detailed proposals for the colour and finish of fencing together with landscaping proposals for the screening of the switch yard and control building.

(c) The BATNEEC principle shall be applied to the selection process for turbines. Prior to commencement of development, the precise specification of the proposed turbines shall be submitted to and agreed with the Planning Authority. Turbines shall not be replaced without the prior written agreement of the planning authority.

(d)Transformers required in association with each individual turbine shall be located within the turbine structure or underground beside the turbine in accordance with details to be agreed with the Planning Authority prior to the commencement of development.

(e)Soil, rock and sand excavated during construction shall not be left stockpiled on site following completion of works. Details of treatment of stockpiled materials shall be agreed with the Planning Authority prior to commencement of development.

(f)Excavated banks and bases around the turbines shall be re-laid with overlying turf removed during construction.

Reason: In the interest of visual amenities of the area.

4. Prior to commencement of development, the developer shall submit to and agree in writing with the Planning Authority proposals in relation to vehicle types and the use of public roads in the area during the construction phase. Construction operations involving heavy goods vehicles supplying the site shall be restricted to between 0800 hours and 2000 hours Monday to Friday and 0800 hours and 1800 hours on Saturdays.

Reason: In the interest of orderly development and residential amenities.

5. Facilities shall be installed at the developers' expense to minimise interference with communications, radio or television in the area. Details of facilities to be installed shall be submitted and agreed with the planning authority following consultation with the relevant authorities prior to commissioning of the wind turbines.

Reason: In the interest of residential amenity.

6. Noise levels emanating from the proposed development when measured at the nearest inhabited house shall not exceed 40 dBA (15 minutes Leq) at wind speed of 5 metres/second and 45 dBA (15 minutes Leq) at wind speed in excess of 10 metres/second. Measurements shall be made in accordance with ISO recommendations R1996/1 (Acoustics – Description and Measurement of Environmental Noise, Part 1: Basic Qualities and Procedures).

Reason: In the interest of residential amenity.

7. Prior to the commissioning of the plant the developers shall arrange for the monitoring of noise levels within one year of the commissioning of the development. The nature and extent of the monitoring programme shall be agreed with the Planning Authority. Mitigation measures shall be submitted to the planning authority for written agreement, in the event of noise levels exceeding the permitted levels and having an adverse impact on nearby properties.

Reason: In the interest of residential amenities.

8. The developer shall facilitate the Planning Authority in preserving, recording or otherwise protecting archaeological materials or features that may exist within the site. In this regard, the developer shall -

   (a) Notify the Planning Authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development,

   (b) Employ a suitably-qualified archaeologist who shall monitor all site investigations and other excavation works, and

   (c) Provide satisfactory arrangements for the recording and removal of any archaeological material, which may be considered appropriate to remove.

   Reason: In order to conserve the archaeological heritage of the site and to secure the preservation of any remains which may exist within the site.

9. (a) Prior to commencement of development a detailed reinstatement programme, providing for removal of foundations and roads shall be submitted to shall be submitted to and agreed in writing with the Planning Authority. On full or partial decommissioning of the wind farm, or if the wind farm ceases operation for a period of more than one year, the masts and turbines concerned, including foundations, shall be dismantled and removed from the site. The site shall be reinstated in accordance with the said programme

(including all access roads) and all decommissioned structures shall be removed within three months of decommissioning.

(b) Prior to commencement of development, the developer shall lodge with the Planning Authority a cash deposit, a bond of an insurance company, or other security to secure the satisfactory reinstatement of the site, upon cessation of the project, coupled with an agreement empowering the planning authority to apply such security or part thereof to the satisfactory reinstatement of the site. The form and amount of the security shall be as agreed between the Planning Authority and the developer or, in default of agreement, shall be determined by An Bord Pleanála.

Reason: To ensure the satisfactory completion of the project.

10. Before development commences details of aeronautical requirements shall be agreed in writing with the Planning Authority. Subsequently the developers shall inform the Planning Authority of the co-ordinates of the 'as constructed' position of the turbines and the highest point of the turbines (to the top of the blade).

Reason: In the interest of air traffic safety.

11. This permission shall not in anyway be construed as any form of consent or agreement to a connection to the national grid or to the routing or nature of any such connection. Prior to commencement of works on site, the applicant shall obtain planning permission for connection of the wind farm to the national grid.

Reason: In the interest of clarity and the proper planning and sustainable development of the area.

12 (a) the construction of the development shall be carried out only outside the breeding season of local sensitive bird species, as specified in the Environment Impact Statement.

(b)An annual monitoring programme to review interaction by birds with the wind farm, to survey species and to document bird casualties shall be submitted to the Planning Authority for written agreement prior to commencement of development. This programme shall be developed in consultation with the Planning Authority and the heritage division of the Dept. of Local Government, Heritage and Local Government and shall cover the entire period of the operation of the wind farm and the programme shall be forwarded to the Planning Authority.

13. Turbines T9 to T12 as indicated on the drawings received by the Planning Authority shall be located a minimum of 300 metres from the unplanted heath / bog edge and a revised site layout plan indicating the revised location and layout of the turbines shall be submitted to and agreed with the Planning Authority prior to the commencement of development works on the site.

Reason: In order to ensure satisfactory carrying out of development in relation to protection of fauna and ensure the protection of the foraging habitat of the hen harrier.

14. The turbines shall be located in compartments scheduled for felling after the windfarm's operational lifetime.

Reason: In order to ensure satisfactory carrying out of development in relation to protection of fauna and ensure the protection of the foraging habitat of the hen harrier.

15. A detailed management plan for the clear felling and replanting of trees on the site shall be submitted to and agreed with the Planning Authority prior to the commencement of development works on the site. The management plan shall provide for the non-felling and retention of trees in a manner consistent with the protection of the habitat of the hen harrier.

Reason: In order to ensure satisfactory carrying out of development in relation to protection of fauna and ensure the protection of the foraging habitat of the hen harrier.

16. Silt traps shall be provided on all surface water drainage channels arising from this development. Details in this regard shall be submitted to the Planning Authority for agreement prior to the commencement of development works on the site.

Reason: To prevent water pollution.

17. Details of arrangements for the storage of liquids and hydrocarbons on site shall be submitted to and agreed in writing with the Planning Authority prior to commencement of development.

Reason: In the interest of the proper planning and development of the area.

18. The developer shall pay a sum of money to the planning authority as a contribution towards expenditure that was and/or that is proposed to be incurred by the Planning Authority in respect of road improvement facilitating the proposed development. The amount of the contribution and the arrangements for payment shall be agreed between the developer and the Planning Authority or, in default of agreement, shall be determined by An Bord Pleanála.

In the case of expenditure that is proposed to be incurred, the requirement to pay this contribution is subject to the provisions of section 26(2)(h) of the Local Government (Planning and Development) Act, 1963 generally, and in particular, the specified period for the purposes of paragraph (h) shall be the period of seven years from the date of this order.

Reason: It is considered reasonable that the developer should contribute towards the expenditure that was and/or that is proposed to be incurred by the planning authority in respect of works facilitating the proposed development.

Derek Daly

22nd of March 2004

Inspectorate

"To determine if the NIMBY phenomenon explains the slow progress of wind farm development or do institutional factors need to be taken into consideration"

Appendix 5

Sliabh Reagh Inspector's Report

An Bord Pleanála

Inspector's Report

File Reference:	PL 13. 126058
Proposed Development:	Layout and associated site works including access track for three no. wind turbines, and sub station with control room.
Address:	Sliabh Reagh, Kilfinane, Co. Limerick
Type of Appeal:	First Party v. Refusal of Permission
Reg. Ref.:	01/118 3
Planning Authority:	Limerick County Council
Applicant:	Mr. John Clery
Appellant:	Mr. John Clery
Observer:	Paddy O' Dwyer, Martinstown
Date of Site Inspection:	28th December 2001.

INTRODUCTION

I have read the file, inspected the site, considered the grounds of appeal and assessed the proposal in the context of the proper planning and development of the area.

SITE LOCATION AND DESCRIPTION

Sliabh Reagh is located approximately 13 miles south-west of Tipperary town and 9 miles north-west of Mitchelstown. It is approximately 3 miles north-west of the village of Ballylanders and roughly the same distance north-east of the village of Kilfinane.

Sliabh Reagh rises to 1531 feet and is a very prominent feature in this area. The area itself is relatively sparsely populated but there are settlement nodes in the villages of Ballylanders and Kilfinane. Sliabh Reagh carries significant expanses of coniferous forestry and there is a prominent telephone mast close to the Pinnacle (the highest point); there are overhead wires leading to the mast. There are panoramic views in most directions from the ridge of Sliabh Reagh and these are illustrated on the attached photographs taken at the time of inspection. I noted a wind monitoring mast on the site. I also noted walking route markers leading towards the ridge from the southern side.

THE PROPOSED DEVELOPMENT

The proposal is for layout and associated site works including access track for three no. wind turbines and sub station with control room. The site area is stated to be 30 hectares (70 acres).

In a letter accompanying the application it is stated that the applicant went to great lengths of informing and educating local communities regarding the project. All communities were in support of the project. A number of letters are submitted from local groups supporting the project. These are all dated 1994 and come from the following :-

- Local drama group
- M Callan, MCC
- Knocklong Development Association
- Glenbrohane Community Association
- Ballylanders Community Development Association
- Tom Ryan, Scarteen Hunt member
- Kncoklong/Glenbrohane parish

The Heritage Officers report dated the 21st June, 2001 recommends refusal due to the effects on visual amenity both of the hill itself and the effects on views of the hill from the surrounding countryside.

GROUNDS OF APPEAL

The proposed development would not seriously injure the amenities of the area and would be in accordance with the proper planning and development of the area, having regard to

- The national strategy relating to the achievement of emissions reductions set under the Kyoto protocol.
- The National requirement under AER to develop 40 MW with small scale wind energy projects.
- The site location which does not come within the scope of specific restrictions for scenic areas as set out in the County Development Plan.

OBSERVER

Mr. Paddy O'Dwyer, Martinstown

As the nearest neighbour, Mr. O' Dwyer objects to the proposal. He supports the development in principle but only for two turbines. Turbine 3 and associated works should be omitted. The observation records the following points

1. Turbine 3 is located adjacent to Mr. O' Dwyer's fence without permission or consultation. The blades would pass over/or be adjacent to his lands. This would result in significant noise, visual impact and air turbulence.
2. Turbine 3 would affect the observer's livelihood - farming of cattle, sheep and horses. He submits a veterinary report.
3. Turbine 3 would significantly devalue the observers property - as a farm and as an amenity.
4. Resulting power lines would have to pass over the observer's lands and adjacent to his dwelling. The route for the power lines should be finalised before a decision is made.

A letter signed by a Dr. Olga Bunting, veterinary medicine, accompanies the observation. It states that turbine 3 would have a detrimental impact on Mr. O' Dwyer's farm through visual impact, noise and wind turbulence.

FIRST PARTY RESPONSE TO OBSERVER

1. In the additional information submission dated 13th July, 2001 turbine 3 was relocated away from the observers boundary.

2. In 1994 the observer was in favour of siting wind turbines on his own lands. A copy letter is submitted.

3. Dr. Olga Bunting should not present herself as an independent consultant on this matter.

4. In 1993/94 a wind speed monitoring device was erected on Sliabh Reagh with the observers consent and with planning permission.

DÚCHAS SUBMISSION

By letter dated 9th November, 2001 the Board sought the comments of Dúchas, the Heritage Service. A submission date stamped the 4th December, 2001 may be summarised as follows

1. The site relates to the environs of several Recorded Monuments namely

   - L1048 - 066 (earth work and souterrain) 240 metres to the south.
   - L1048 - 081 (cemetery cairn possible) 170 metres to the north
   - L1048 - 039 (standing stones - pair) 960 metres to the west.
   - L1048 - 034 (Cush Archaeological Complex a national monument) 1400 metres to the west.

There is a possibility for prehistoric burial cairns or field systems on this hill.

2. It is recommended that an archaeological impact assessment be carried out including field walking of the area by an approved archaeologist. The aims of this should be to establish the presence or otherwise of obvious monuments and to determine if there are visual issues relating to known monuments and any monuments which might be discovered in the field walking. If permission is to be granted it is recommended that a condition be attached for licensed archaeological monitoring of all ground disturbance.

FIRST PARTY RESPONSE TO DÚCHAS SUBMISSION

1. The condition required by Dúchas for archaeological monitoring can be accommodated by the project. Wind turbine locations can easily be moved by up to 20 metres, if necessary.

2. The requirement for an archaeological impact assessment could be accommodated, but the added expenditure would make the project more difficult to fund at this stage.

The recorded monuments referred to by Dúchas are in the vicinity of a telecom mast and where roads were recently granted planning permission and constructed (Reg. Ref. 98/991).

D.O.E. WINDFARM DEVELOPMENT GUIDELINES

The development of alternative energy sources is a priority, nationally and at European level.

- The visual impact is among the most important considerations to be taken into account. Visual impact is influenced by the following
  - form and characteristics of the landscape
  - design and colour –
  - the existing skyline
  - layout of turbines
  - number and size of turbines.

  Turbines should not dominate landscape features especially views of special amenity or special interest which it is necessary to preserve, and views from adjacent areas subject to national or international designation or designated in the County Development Plan as been of high landscape quality. Turbines should not be prominent when seen against an elevated skyline background from public roads, towns or village centres.

- Noise impact should be assessed by reference to the nature and character of nearby surroundings and developments.

- Wind farm developments, both during the construction and operational phases, may impact significantly on the ecology, archaeology, geology and heritage of an area. An assessment of the impact of the development on the known or likely archaeological potential should be made, and arrangements made for any necessary investigation. Adequate protection should be afforded to monuments of archaeological interest.

DEVELOPMENT PLAN

Chapter 12 refers to Alternative energy/renewable energy.

The Planning Authority will take a positive approach to the development of renewable resource energy provided that the development does not detract from Limericks other environmental resources - economic, scenic, natural, historic and recreational. The policy includes the following

- Adopt a positive approach where environmentally acceptable.
- Restrict the number and size of developments particularly in sensitive locations.
- Prohibit inappropriate developments such as large-scale forestry developments adjacent to renewable/alternative energy projects.

There are no views or prospects directly affecting Sliabh Riabh.

Regional roads pass through Ballylanders and Kilfinane. Roads surrounding Sliabh Reagh are local roads.

There are no Natural Heritage Areas in the vicinity of the mountain. The nearest areas are to the south of Kilfinane.

There are no SACs indicated in the Development Plan in the vicinity of Sliabh Reagh.

This is not a designated amenity area. An amenity walk is shown roughly linking Galbally to the east north east and Kilfinane to the west south west of Sliabh Reagh.

PLANNING ASSESSMENT

This assessment is set out in the following format

- The proposed development and decision
- Development Plan/windfarm guidelines
- Visual impact
- Archaeological concerns
- Other Issues

The Proposed Development

The proposal is for a windfarm comprising the following elements.

1. ***Three turbines.***

These are three blade turbines with a rotor span of 52 metres. The turbine type is Vestas V52-850 kilowatt. The towers are of tubular design but unspecified height. The only elevational drawings submitted shows a tower which could vary between 40 metres and 86 metres in height. Other documentation submitted in relation to "standard foundation for windmill" indicates a 47.1 metre tube tower and it is on this basis that I carry out my assessment. The

outside diameter for each tower measures 3,315 millimetres at the base and 2.0 metres at the top. The speed of revolution of the rotor may vary from 14.0 to 31.4 rpm and each rotor has a clockwise rotation.

2. Substation with a control room. This measures 3,515 millimetres square and is approximately three metres above ground level.

3. Site track and upgrading of existing forestry site access.

4. Associated works.

The overall site area is stated to be 30 hectares (70 acres).

The Planning Authority decided to refuse permission for a single reason relating to serious injury to the visual amenity of the area.

Development Plan/Guidelines

The site is not given any specific amenity designation in the County Development Plan. There are no listed views of special amenity value or special interest which directly affect this site. There is a public walking route in the vicinity of the site.

It is a policy of the Development Plan to adopt a positive approach to the development of renewable energy sources where they are environmentally acceptable. The windfarm guidelines recognise that the development of alternative energy sources is a priority, nationally and at European level. They recognise that visual impact is among the more important considerations to be taken into account.

Visual Impact

Sliabh Reagh is a very prominent feature in this area and this is illustrated, in part, on the attached photographs taken at the time of inspection. There is an existing telephone mast close to the top of the mountain and this is clearly visible in many local views. There are significant areas of coniferous forestry on the slopes of the mountain.

The nearest regional roads, as indicated in the County Development Plan, pass through Ballylanders (approximately three miles to the east south east) and Kilfinane (approximately the same distance to the south west). These appear to be the main centres of population in the vicinity of the site. Local roads from which there are many interesting and scenic views encircle the mountain. The Planning Authority's reason for refusal refers to the exposed and elevated position and I consider this to be an accurate description of the site. By their nature many wind farm proposals tend to be made on such sites. The Planning Authority also concludes that the proposal would be excessively prominent and obtrusive, and would seriously injure the visual amenities of the area; I consider this to be a key consideration for the Board.

With reference to the Wind Farm Guidelines it is noted that Sliabh Reagh is partly forested and also has a prominent telephone mast and overhead lines close to its highest point. This assessment is being made based on a 47 metre tower and 52 metre rotor span. As such the overall maximum height of each turbine would be 73 metres. I submit that the turbines would be prominent in local public views, particularly from some of the local roads surrounding the site. They would also be clearly seen from the population centres of Ballylanders and Killfinane but at a distance of approximately three miles. I do not consider that the access track or sub station would be particularly prominent features in local public views, other than from the designated footpath in the vicinity of the site.

Having regard to the size and small number of turbines proposed, the form and characteristics of the landscape, the separation distance from housing, centres of population and regional roads, the provisions of the Windfarm Guidelines which I interpret to generally favour such developments on appropriate sites, and to the absence of any specific amenity designation or listings for this area as set out in the county Development Plan, I conclude that the proposed development would not seriously injure the visual amenities of the area.

Archaeological Concerns

I note that the Planning Authority's decision does not raise archaeological concerns in the reason for refusal.

The Board sought the comments of Dúchas in relation to this proposal. In response Dúchas listed the Recorded Monuments in the environs of the site as follows

- L1048 - 066 (earth work and souterrain) 270 metres to the south.
- L1048 - 081 (cemetery cairn possible) 170 metres to the north.
- L1048 - 039 (standing stones - pair) 960 metres to the west
- L1048 - 034 (Cush Archaeological Complex, a national monument) 1400 metres to the west.

In addition it is stated that there is a possibility for prehistoric burial cairns or field systems on this hill. Dúchas recommends that an archaeological impact assessment be carried out including field walking of the area by an approved archaeologist, and that a condition be attached to any permission granted requiring archaeological monitoring of all ground disturbance. The first party indicates that the requirement for archaeological monitoring can be accommodated by the project.

In the circumstances outlined, I consider that this matter could be satisfactorily addressed by way of a suitably worded condition attached to any permission granted by the Board.

Other Issues

The observer contends that the proposed turbine 3 would result in significant noise, visual impact and air turbulence with respect to his adjoining property. The first party points out that turbine 3 was relocated away from the observers boundary by way of additional information date stamped the 13th July, 2001. I note that on Drawing No. 830 - 100 - 002 the location of the most easterly of the three turbines is moved further to the south. Having regard to the nature and scale of development proposed and the separation distance from noise sensitive buildings, I do not consider that noise is a serious concern in this case. Nor do I consider that there is convincing evidence to indicate that air turbulence or shadow flicker are likely to give rise to significant disamenity or disturbance. Based on the information before me, I do not consider that the proposed development would give rise to devaluation of property in the vicinity.

The report from the Planning Authority's Environment section states that this is an important habitat for several bird species but presents no convincing evidence on this point. The Panning Authority's reason for refusal does not make any reference to this matter. In the circumstances I consider that it would be unreasonable to refuse permission for reason relating to endangerment of vulnerable bird species.

CONCLUSION AND RECOMMENDATION

I conclude that the proposed development would be in accordance with the national policy and the proper planning and development of the area.

I recommend that planning permission be granted.

FIRST SCHEDULE

Having regard to

(a) National policy regarding the development of alternative and indigenous energy sources and the minimisation of emissions of green house gases.

(b) The guidelines issued by the Department of the Environment and Local Government in 1996 on wind farm development.

(c) The height of the turbines and the scale of the proposal.

(d) The location of the proposed development in a general development area which has no specific restrictions with regard to development in scenic areas.

(e) The separation distance of the site from existing houses, villages and regional routes.

it is considered that, subject to compliance with the conditions set out in the Second Schedule, the proposed development would not seriously injure the visual amenities of the area, would not have a significant adverse impact on the environment and

would not seriously injure the amenities of dwellings in the vicinity. The proposed development would therefore be in accordance with the proper planning and development of the area.

SECOND SCHEDULE

1. This permission relates to three turbines with a hub height of 47.1 metres and a rotor span of 52 metres. The layout shall be in accordance with drawing no. 830- 100-002 submitted to the Planning Authority on the 13th July, 2001 by way of additional information.

   Reason: In order to clarify the development which this permission relates.

2. The wind turbines, including the masts and the blades, shall be finished externally in a light grey colour. Samples of coloured material shall be submitted for the written agreement of the Planning Authority before development commences. Cables within the site of the proposed development shall be laid underground. All wind turbines shall be geared to ensure that the blades rotate in the same direction.

   Reason: In the interest of visual amenity.

3. At the critical wind speed (that is the speed at which the noise radiated by the total compliment of wind turbines and blades is most substantially in excess of bacground noise), the noise from the wind farm, as measured externally at any dwelling house, shall not exceed 40 dBA.

   Reason: In the interest of residential amenity.

4. Rock and soil excavated during construction shall not be left stock piled on site following completion of the construction works. Details of the disposal of excavated rock and soil shall be submitted to and agreed with the Planning Authority prior to the commencement of work on site.

   Reason: In the interest of visual amenity.

5. Transformer's associated with each individual turbine and mast shall be located either within each turbine mast structure or shall be located underground beside the mast.

   Reason: In the interest of visual amenity.

6. Facilities shall be installed at the developers expense to ensure that radio or television transmissions in the area are not interfered with by the proposed development. Details of the facilities to be installed shall be submitted to and agreed with the Planning Authority following consultation with the relevant authorities prior to the wind turbines been commissioned.

Reason: To prevent interference with radio or television transmission and in the interest of residential amenity.

7. Prior to commencement of development, details of aeronautical requirements shall be agreed in writing with the Planning Authority. Subsequently, the developer shall inform the Planning Authority of the co ordinates of the as-constructed position of the turbines at the highest point of the turbine (to the top of the blade spin).

Reason: In the interest of public safety.

7. 1. On decommissioning or any partial decommissioning of the windfarm, the masts and turbines which are decommissioned shall be dismantled and removed from the site and the lane reinstated.

2. Prior to commencement of development, the developer shall lodge with the Planning Authority a cash deposit, a bond of an insurance company, or other security to secure the satisfactory reinstatement of the site upon cessation of the project, coupled with an agreement empowering the Planning Authority to apply such security or part thereof to the satisfactory reinstatement of the site. The form and amount of the security shall as agreed between the Planning Authority and the developer or, in default of agreement, shall be determined by An Bord Pleanala.

Reason: To ensure satisfactory reinstatement of the site upon cessation of the project.

8. Details of the road network to be used by construction traffic and by long term maintenance traffic shall be submitted to and agreed with the Planning Authority prior to commencement of development.

Reason: In the interest of orderly development.

9. The developer shall facilitate the Planning Authority in preserving, recording or otherwise protecting archaeological materials or features that may exist within the site. In this regard, the developer shall
   a) notify the Planning Authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development
   b) employ a suitably qualified archaeologist who shall monitor all site investigations and other excavation works, and
   c) provide satisfactory arrangements for the recording and removal of any archaeological material which may be considered appropriate to remove.

Reason: In order to conserve the archaeological heritage of the site and to secure the preservation of any remains that may exist within the site.

10. Prior to commencement of development, the developer shall lodge with the Planning Authority a cash deposit, a bond of an insurance company, or other

security to secure the reinstatement of public roads which may be damaged by the transport of materials to the site, coupled with an agreement empowering the Planning Authority to apply such security or part thereof to the satisfactory reinstatement to the public road. The form and amount of the security shall be as agreed between the Planning Authority and the developer or, in default of agreement, shall be determined by An Bord Pleanala.

Reason: In the interest of road safety and the proper planning and development of the area.

Des Johnson
Deputy Planning Officer

February, 2002

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