Deloitte.

IWEA
Irish Wind Energy Association

Jobs and Investment in Irish Wind Energy

Powering Ireland's Economy

Contents

Foreword

The past decade has provided a period of prolonged economic growth leading to increased living standards throughout most of the world including on the island of Ireland. However, this growth has been heavily fuelled by unsustainable consumption of fossil fuels and credit. The current economic turmoil followed a period of unprecedented high fossil fuel prices and increasingly complex financial transactions. We are now striving to re-invent our economic model to preserve and continue improving our standards of living but to do this in a way that is more stable and that can be sustained. This will be a key challenge for all policy makers and entrepreneurs for the coming decades.

While this will take significant efforts and innovations it is important that we start to move forward on areas where we have already identified opportunities for progress. Developing Ireland's wind energy potential falls very firmly into this space. Ireland is fortunate to enjoy one of the best wind resources in the world. Developing this resource will reduce and stabilise energy prices in Ireland and boost our long term competitiveness as an economy. It will also significantly reduce our dependence on imported fossil fuels. These benefits and the ability of wind to reduce our CO2 emissions are well understood by policy makers and were instrumental in the development of our progressive 40% renewable electricity target for Ireland and will be important considerations in the forthcoming Strategic Energy Review in Northern Ireland.

This report, however, focuses on other important benefits of wind energy namely its ability to create investment and jobs. IWEA believes that it is incumbent on the energy industry to do more than simply meet our targets we must do this in a way that provides the maximum benefit to our economy and society. By developing the industry in a robust fashion that allows early investment we will create more domestic jobs sooner. We will also create opportunities for local companies to become part of the supply chain for the industry within our domestic markets and abroad. This report is a vital component in quantifying this potential development to assist policy makers in understanding the potential of this sector and reflecting this in their deliberations.

The report looks exclusively at direct jobs in the sector and makes limited allowance for the potential of local companies to build expertise in Ireland and to sell that abroad. This is one of the most promising sectors of the knowledge economy. The ability to create in excess of 10 000 jobs on the island of Ireland in a domestic industry is highly significant. Our ability to leverage this to develop new innovations and to sell these internationally will be a key contributor to the next phase of our economic growth. IWEA will continue to work with its members and stakeholders to ensure we succeed.

Finally I would like to thank Deloitte for their excellent work on this report and all the contributors who gave so freely of their time and expertise.

Michael Walsh
Chief Executive Officer

Executive Summary

In January 2007, the European Parliament voted, by an overwhelming majority, for a 25% target for renewable energies in the EU's overall energy consumption by 2020. The Department of Energy and Transport then prepared a Renewables Road Map which set out the long term vision for renewable energy sources in the EU. It proposed a mandatory target of 20% for renewable energy's share of energy consumption in the EU by 2020. Ireland's individual target under this Directive is for 16% of total energy consumption to come from renewable resources. Driven by this EU initiative, Noel Dempsey, the then Minister for Environment, Heritage and Local Government introduced a target of 33% for renewable electricity's share of electricity consumption in Ireland in his department's Energy White Paper. This target was then increased by Minister Ryan to 40% in late 2008 as part of the Government's strategy to make the green economy a core component of its recovery plan for Ireland. Northern Ireland is currently preparing to conduct a Strategic Review of Energy policy and it is envisaged that this will result in a progressive target for renewable electricity.

It is also envisaged that wind energy will provide the largest source of renewable energy in achieving this target and it is estimated that installed wind capacity will need to reach 7,800 megawatts (MW) on the island of Ireland to achieve these targets by 2020. For the purposes of this study, it has been assumed that 6,500 MW will be located in Ireland and 1,300 MW in Northern Ireland.

In early 2009, there was 1,320 MW of installed wind energy capacity across the island of Ireland. In order to reach the 2020 target, another 6,480 MW will be required to be installed. The majority of these will come from the larger scale turbine installations which have occurred over the last number of years but will also come from a new growing market for the installation of small scale turbines (Microgeneration). It will be impossible to get the necessary number of wind farms approved, constructed, installed and maintained without people and investment.

Based on these estimates of MW to be installed, the Irish wind energy sector to 2020 is capable of supporting more than 10,760 jobs through direct and indirect involvement in the sector. The construction and development of wind energy projects across the island will involve c. €14.75 billion of investment; c €5.1 billion of which will be retained in the local Irish economy to 2020. Of the €5.1 billion it is estimated that c.€4.3 billion will be invested in Ireland and c. €0.8 billion will be invested in Northern Ireland.

Other opportunities in the Wind Energy Sector are becoming apparent, such as grid development upgrade works, pump storage, energy exports and electric transport and many others, and these initiatives will all contribute positively to the growing employment numbers in the wind energy sector and the investment in the sector. At this stage, the research is still ongoing in relation to these initiatives and as such employment numbers cannot be quantified accurately.

Construction provides the majority of the jobs opportunities available from the wind energy sector. Offshore wind development requires significant construction inputs in order to develop the large scale wind farm projects planned. It is estimated that there will be in excess of 7,250 jobs that can be supported by the construction element of wind energy projects.

A number of challenges such as grid access; shortage of experienced personnel and lack of awareness about employment opportunities in the sector have been identified and act as a barrier to the sector evolving and reaching the targets set by Government. In order to tackle these issues, work must continue in relation to the roll out of grid upgrades and information on careers in the sector needs to be distributed at secondary and third-level so that students are aware of the paths open to them paths open to them.

1. European Wind Energy Sector

Recent studies have shown that in 2007 with an installed capacity of just over 56,500 MW, the EU wind energy sector employed more than 150,000 people directly and indirectly in the sector. "Direct" jobs relate to employment within wind turbine manufacturing companies and manufacturers, whose main activity is the supply of wind turbine components; it also takes into account wind energy project developers, utilities selling electricity from wind energy and major research and development (R&D), engineering and specialised wind energy services. Any other company producing components, providing services or sporadically working in wind-related activities is deemed to provide indirect employment.

Table 1

Direct Employment from Wind Energy Companies in European Countries

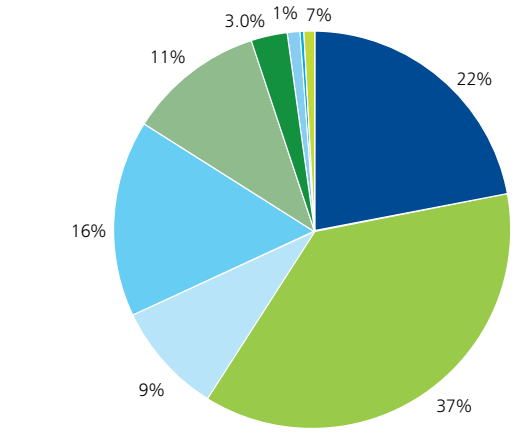
Country	No. Of Direct Jobs
Austria	700
Belgium	2,000
Bulgaria	100
Czech Republic	100
Denmark	23,500
Finland	800
France	7,000
Germany	38,000
Greece	1,800
Hungary	100
Ireland	1,500
Italy	2,500
Netherlands	2,000
Poland	800
Portugal	800
Spain	20,500
Sweden	2,000
United Kingdom	4,000
Rest of EU	400
TOTAL	108,600

Source: EWEA Wind at Work

As outlined in the Table 1, around 75% of the direct employment is located within Germany, Denmark and Spain. These countries are responsible for this significant portion of direct employment mainly because they are the leaders in the manufacturing of wind turbines and blade components. These three countries are recognised as the initial pioneers of wind energy and are now enjoying the benefits of being the first movers in relation to establishing a wind energy sector in their countries. Each of these countries hosts some of the world's largest wind energy companies, especially in turbine and component manufacturing.

In all three countries, local economies and communities have been regenerated through embracing wind energy and focusing on building a successful wind economy. Regions such as Navarra in Spain, the north-west in Denmark and Schleswig-Holstein in Germany have become renowned as examples of the regeneration and economic benefits of investing early in the wind energy sector.

Figure 1
Direct employment by type of company



Source: IWEA and Deloitte Study

EWEA analysis found that wind turbine and component manufacturing provides the majority of employment opportunities at circa 59% of direct employment. These elements represent 12.5 of the 15.1 jobs created in the EU for every MW installed. Ireland has largely missed the initial opportunity to build a significant wind turbine and components manufacturing industry and the majority of turbines and components are being imported from the continent. It has also been found that typically the wind turbine manufacturers use their own teams for the installation of turbines in Ireland; installation represents another 1.2 of the 15.1 jobs created in the EU for every MW installed. Therefore, it can be said that Ireland has not capitalised on 13.7 of the 15.1 jobs created in the EU for every MW installed like some of its European neighbours to date.

2. Irish Wind Energy Sector Today

Renewable energy development will be a vital part of Ireland's strategy to tackle two major challenges facing us today – ensuring a secure supply of energy and combating climate change. In recent years Ireland has become heavily dependent on the importation of fossil fuels in order to meet its energy needs, with fossil fuels accounting for 96% of all energy consumed in Ireland in 2006. Similarly Northern Ireland has a 99% reliance on imported fossil fuels for its energy needs[1].

This high dependency on energy imports is highly risky and Ireland is currently extremely vulnerable both in terms of meeting future energy needs and ensuring price stability. Accordingly, the Department of Communications, Energy and Natural Resources' (DCENR) energy policy has been moving towards greater levels of self-sufficiency, with renewable energy being a key part of the Government's Energy Policy Framework 2007-2020. These points are also reflected in the Department of Enterprise Trade and Investments (DETI) pre-consultation document on Northern Irelands Strategic Energy Framework. Additionally, in the context of the current global economic downturn and a time of increasing uncertainty over world energy prices, the branching out of current resources into the further development and exploitation of our renewable resources will be crucial if Ireland is to meet its renewable energy targets, secure energy supply, and re-power Ireland's Economy.

"Vital that industry stakeholders and state-bodies work together to support the delivery of renewables"

2.1. Targets

Ireland's need to support renewable energy also stems from its international commitments such as the Kyoto Protocol[2] and the European Directive 2001/77/EC[3]. However, a new Directive on the Promotion of Renewable Energy Sources has come into effect in June 2009, which will establish a binding target of 20% of overall EU energy consumption coming from renewable sources by 2020 as well as a binding 10% minimum target for energy from renewable resources in the share of transportation fuels. Ireland's target under the directive is for renewable resources to account for 16% of total energy consumption by 2020. The UK has an equivalent target of 15%. In line with these commitments, DCENR Minister, Eamonn Ryan T.D., announced a revised target for electricity from renewable energy sources (RES-E) of 40% by 2020. In the case of Ireland it is widely acknowledged that wind energy will contribute the vast bulk of this target. Failure to meet the EU targets could result in EU sanctions.

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

1. Ensure that its 2020 target is met.
2. Introduce "appropriate measures" and outline them in a National Renewable Energy Action Plan - designed to ensure that the Member State meets its interim trajectory. This Action Plan is to be submitted before 30 June 2010.

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

[1]As per quote from Minister Foster at IWEA's Autumn conference 2008 – ref: http://www.irishtimes.com/newspaper/ireland/2008/1004/1222959350453.html

[2]Ireland's specific objectives: limit growth green house gas emissions levels to 13% over 1990 levels

[3]EU target of 21% electricity from RES by 2010, Irish target of 13.2%

2.2. Current Capacity

In early 2009, there was just over 1,026 MW installed in Ireland and 296 MW installed in Northern Ireland. The MWs are located in twenty-two of the thirty-two counties, with the majority being located in Donegal in the North-West and in Kerry and Cork in the South-West.

Figure 2
Installed wind capacity

Ireland = 1026.37 MW
Northern Ireland = 296.2 MW

Off shore
25.2MW

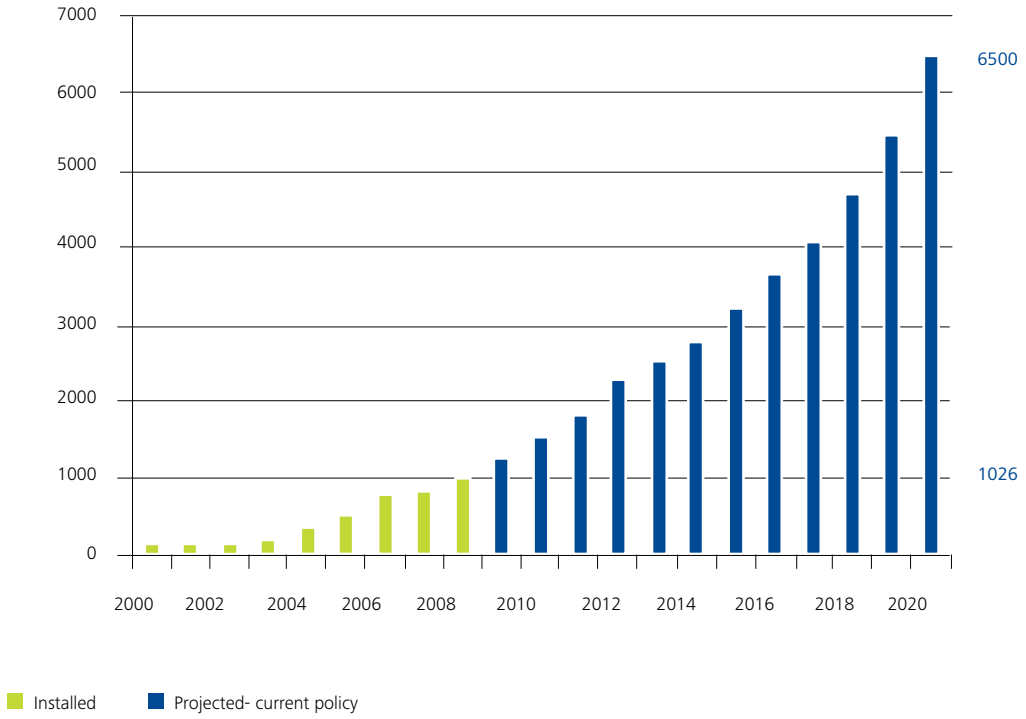
Source: IWEA

2.3. Projected Capacity

As the vast majority of new renewable capacity will be provided by on-shore wind, the 40% target is a significant challenge for the Irish wind industry as a whole. Ireland's current installed wind capacity is now over 1,000MW however another 5,500MW of additional wind capacity, roughly equating to 1,500 new turbines, will need to be installed within the next 12 years if Ireland is to meet its RES-E target.

The projected growth in installed wind energy capacity in Ireland is shown graphically in the chart below. This is based on an assumption of steady industry growth discussed in more detail in Section 4.

Figure 3
Projected Installed Wind Capacity: Ireland in 2020



Source: IWEA

In order to reach the 2020 targets, it is assumed that 7,800 MW will need to be installed and operational by 2020 on the island of Ireland. For the purposes of this Study, we have split the number of MW across the island of Ireland on the basis of 6,500 MW being installed and operational by 2020 in Ireland and 1,300 MW being installed and operational in Northern Ireland.

As outlined, there are currently just over 1,000 MW installed and operational in Ireland with a balance of 5,500 MW to be installed by 2020 in order to achieve the 2020 target. In the North, there are currently just less than 300 MW installed and operational, with a balance of 1,000 MW to be installed by 2020.

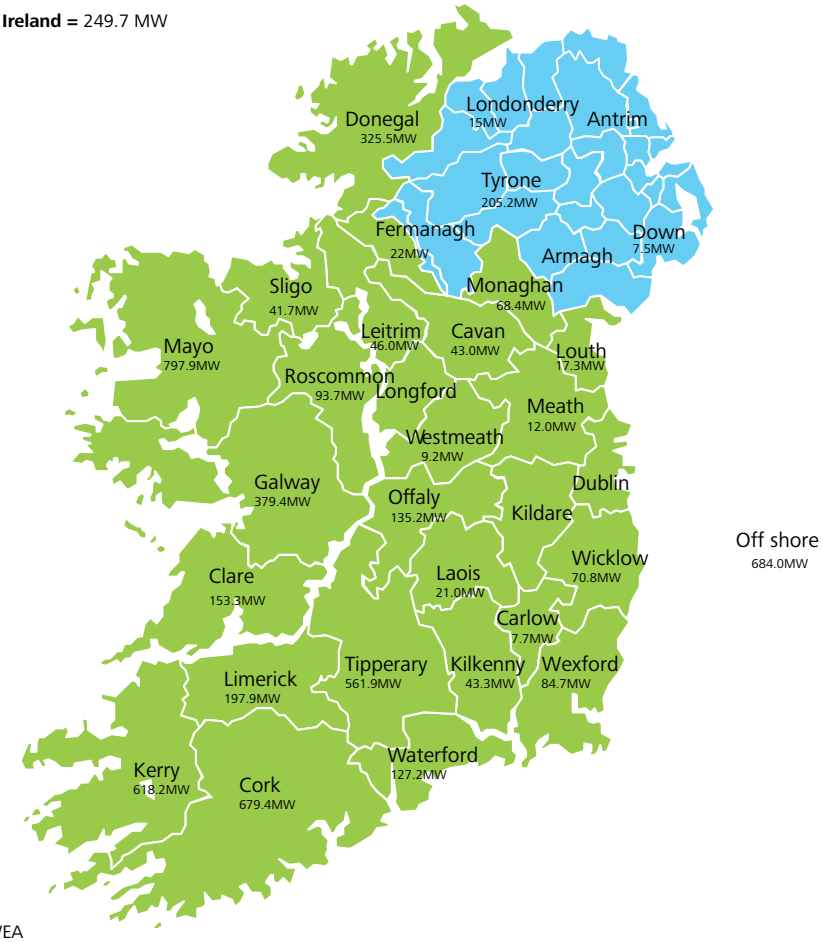
There is currently 5,455 MW of wind energy projects with connection offers provided within the Gate 2 and Gate 3 process in Ireland and within the grid connection process in Northern Ireland. For the purposes of this Study, we have used the size and location of these connection offers together with projects in the planning system in Northern Ireland as a basis to estimate the size and location of the balance of MW to be installed in order to reach the 2020 target. Figures 4 – 10 outline the location of the MW installation of current connection offers and Figure 11 outlines the location of the additional 6,500 MW to be installed.

In addition to the large scale wind farms, there is also expected to be circa 4,500 Microgeneration installations across the island of Ireland over the next number of years with a capacity of approximately 38.5 MW (c. 34MW in Ireland and c. 4.25MW in Northern Ireland). We have included the potential employment numbers to be required in relation to the manufacture and installation of these small scale turbines but as it is not currently known where the installations will be located, we have not included them on the MW location maps.

Figure 4
Total contracted or on offer

Ireland = 5218.52 MW

Northern Ireland = 249.7 MW



Source: IWEA

Note that in Northern Ireland wind farms do not enter the connection queue until after receiving planning permission while in Ireland planned units generally apply for a grid connection first. As part of our analysis, we split the MW to be installed into six categories reflecting the size of wind farm.

Table 2
Connection Applications by Category

Category	Number of MW	No. Of Applications in Category
Category 1	0 – 4.9 MW	85
Category 2	5 – 9.9 MW	52
Category 3	10 – 14.9 MW	31
Category 4	15 – 24.9 MW	50
Category 5	25 – 34.9 MW	27
Category 6	> 35 MW	41
Source: IWEA and Deloitte Study		

Figure 5
Connection applications in category one
0-4.9 MW

Source: IWEA

As outlined in Figure 5 above, there are 231.7 MW with connection offers within Category One. The majority of the MW are located in Cork (27.1 MW), Donegal (36.1 MW), Mayo (22.4 MW) and Tipperary (36.2). The wind farms in this category typically have two small turbines installed.

Figure 6
Connection applications in category two
5 - 9.9 MW

Source: IWEA

As outlined in Figure 6 above, there are 364.8 MW with connection offers within Category Two. The majority of the MW are located in Clare (30.9 MW), Cork (64 MW), Donegal (62.9 MW), Limerick (26.5 MW) and Mayo (32.3 MW).

Figure 7
Connection applications in category three
10 - 14.9 MW

Source: IWEA

As outlined in Figure 7 above, there are 376.3 MW with connection offers within Category Three. The majority of the MW are located in Kerry (106.6 MW), Donegal (49.4 MW), Wexford (40.8 MW) and Cork (35.3 MW).

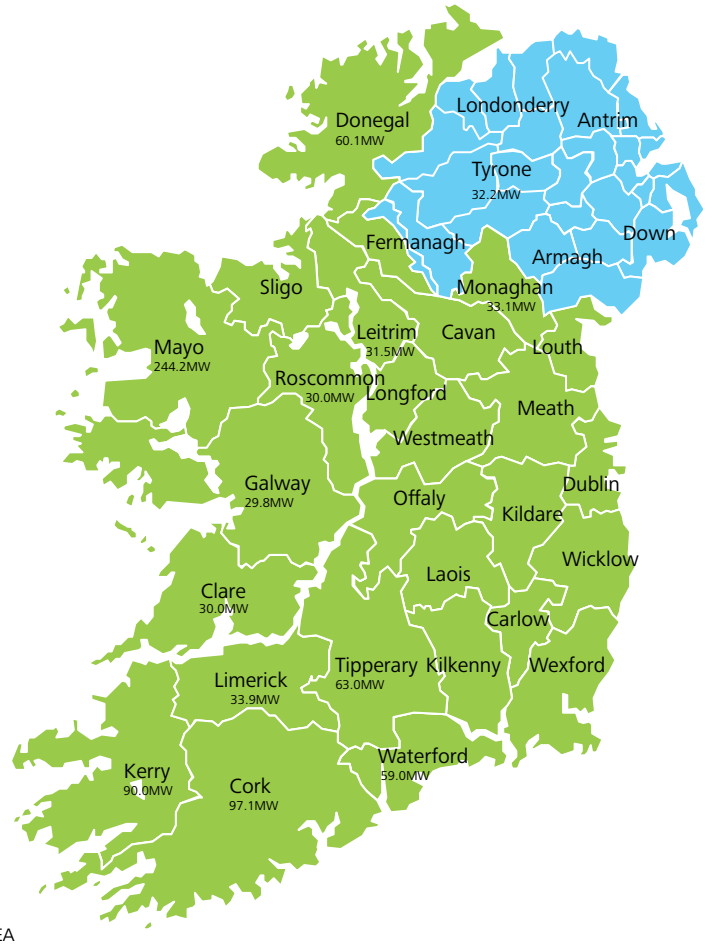
Figure 8
Connection applications in category Four
15 - 24.9 MW

Source: IWEA

As outlined in Figure 8 above,there are 976.2 MW with connection offers within Category Four. The majority of the MW are located in Cork (208.2 MW), Tyrone (109.8MW), Donegal (62.9 MW), Kerry (145.4 MW), Limerick (57.5 MW) and Tipperary (119.1 MW).

Figure 9
Connection applications in category five

25 - 34.9 MW

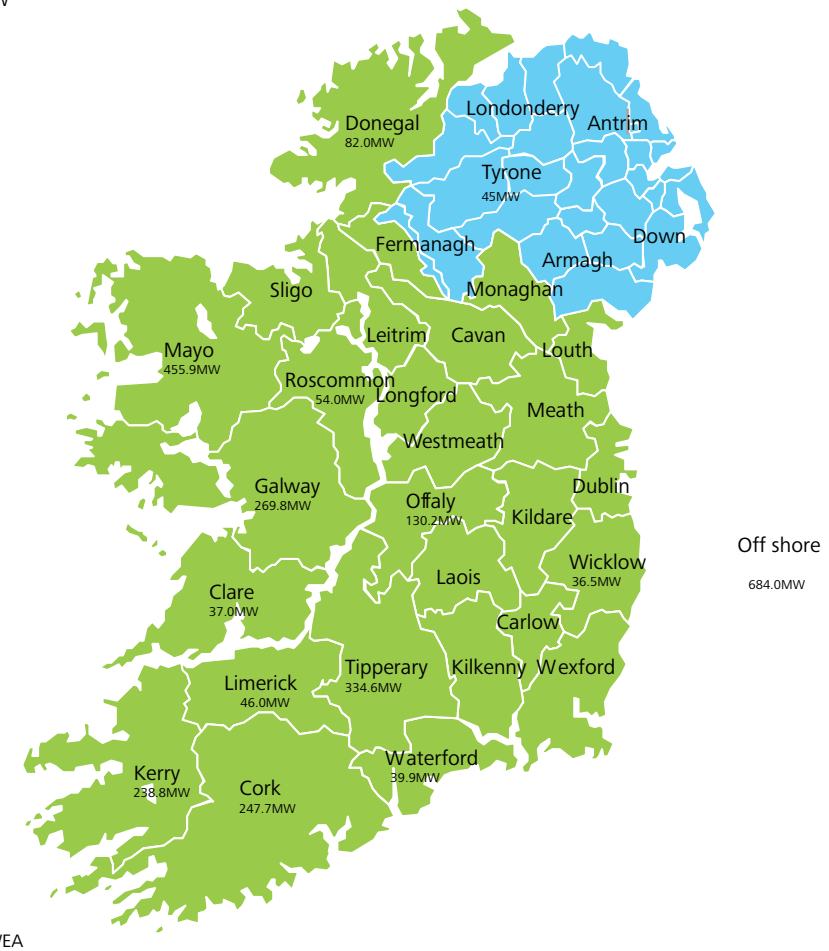


Source: IWEA

As outlined in Figure 9 above, there are 833.9 MW of wind energy projects with connection offers within Category Five. The majority of the MW are located in Cork (97.1 MW), Donegal (60.1 MW), Kerry (90 MW) and Mayo (244.2 MW).

Figure 10
Connection applications in category six

> 34.9 MW



Source: IWEA

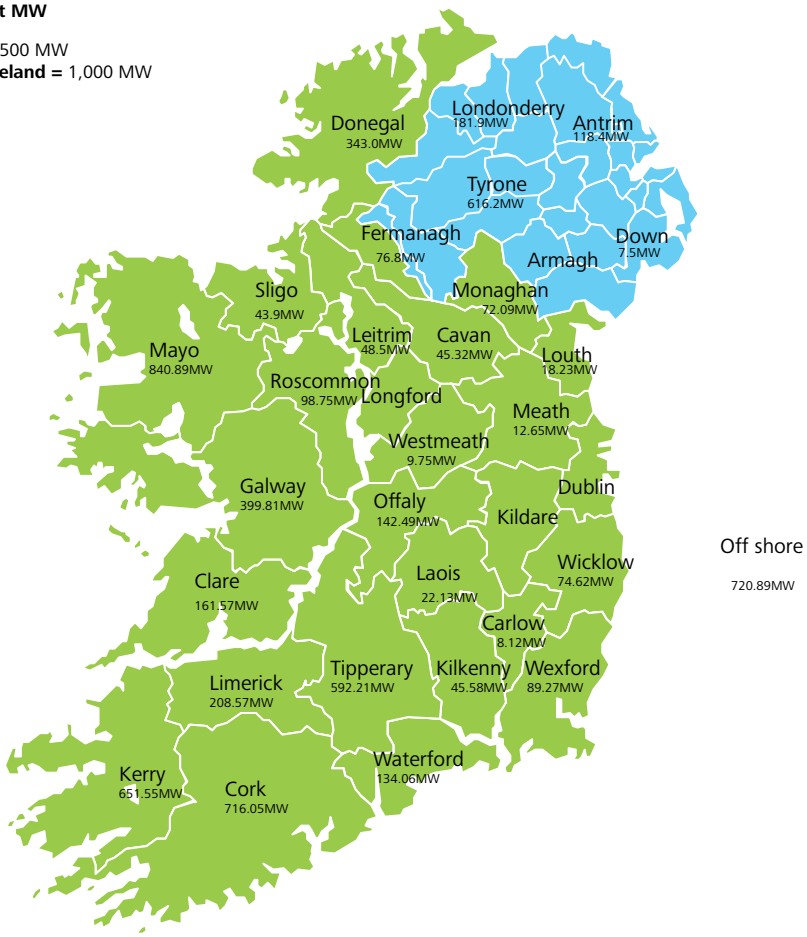
As outlined in Figure 10 above, there are 2,701.4 MW with connection offers within Category Six. The majority of the MW are located in Off shore (684 MW) and also onshore in Cork (247.7 MW), Donegal (82.0 MW), Galway (269.8 MW), Off shore (684 MW), Kerry (238.8 MW) and Mayo (455.9 MW).

There is an additional 1,045 MW to be installed outside of these current connection applications in order to successfully achieve the 2020 target. We have estimated that these additional MW will be installed in line with the size and location of the current applications in the process. Many of these will be in Northern Ireland as a significant number of planned projects have not yet moved in to the connection queue. The geographical spread of these projects reflects the spread of current planning applications, existing projects and grid applications.

Figure 11
Projected location of additional 6,500 MW of wind energy to be installed

Total Target MW

Ireland = 5,500 MW
Northern Ireland = 1,000 MW



Source: IWEA

Figure 11 outlines the expected location of the additional MW to be installed by 2020. This Figure is largely indicative as the actual distribution will depend on many project specific factors.

It is expected that the majority of these MW will be located in Tyrone (616.2MW) Cork (716.05 MW), Off shore (720.89 MW), Kerry (651.55 MW), Mayo (840.89 MW) and Tipperary (592.21 MW).

Employment in the wind energy sector is closely related to the planning, construction, installation of MW and as such jobs supported by the wind industry are located largely where MW are installed and therefore are widely displaced around the island of Ireland.

It should be noted that the large scale expansion of the Irish wind industry will be an extremely positive economic development for Ireland and will result in greater grid security and stability, job creation, lower energy prices and bring about a reduction of greenhouse gas emissions.

2.4. Economic Value

Increasing the share of our energy from renewable sources will deliver significant benefits for the electricity customer, the local economy and society. Recent volatility in fossil fuel prices has demonstrated that regions with a high dependence on energy imports are exposed to a high level of risk. This volatility makes it difficult for investors in the economy to make reliable long term forecasts of their energy costs. The most effective way to reduce this volatility is to increase the share of energy costs that are predictable and based locally. This will lead to lower and more stable long term energy costs. As other regions move to stabilise their long term energy costs it is essential that Ireland and Northern Ireland continue to increase relative competitiveness in this area. It is estimated that between 25 and 30% of capital investment in renewable energy is retained in the local economy. This typically flows to companies in construction, legal, finance and other professional services. Ensuring the security of energy supply is also a key part of the Irish Government's recent Framework for Sustainable Economic Revival and Northern Ireland's pre-consultation on its Strategic Energy Framework. Having regard to the current economic downturn, the framework acknowledges the need to put the energy/climate change agenda at the heart of Ireland's economic renewal. Every new wind farm development provides a substantial contribution to the local and national economy through job creation, authority rates, land rents and increased demand for local support services. More wind on the system will also result in lower and more stable energy prices for consumers while helping us achieve our energy and emissions targets.

3. Study Methodology

At the commencement of our research, it was found that there is not a large amount of historical or empirical information retained in relation to employment or investment statistics in the Irish Wind Energy Sector. For this reason, a tailored survey and questionnaire was prepared for use in this Study. Several studies on the impact of the wind energy sector on employment have been carried out over the last number of years at an EU level and in particular in pioneering countries such as Germany, Spain, the UK and Denmark. These studies are very informative but little information was available for Ireland.

An invitation to participate in the Study process was made available to all members of the IWEA and to selected relevant participants in the sector. A questionnaire was prepared and then circulated to all those that agreed to participate in the Study.

The questionnaire was divided into eight sections as follows:

1. General Information: sought to collect information on the profile of the company such as length of involvement in sector; experience in other energy sectors; number of wind farms and MW involved with.
2. Consultancy Input: sought to collect information on the number and types of consultancy firms used throughout the wind farm development process.
3. Site Approval: sought to collect information on any pre-feasibility work undertaken and the work undertaken during the process of applying and obtaining planning permission including consultants used and the typical length of time to obtain planning permission.
4. Grid Connectivity: sought to collect information on the work required and consultant's advice needed to apply for and secure grid connection. Also sought to identify the length of time taken to obtain grid connection.
5. Legal Concerns & Capital Raising (Pre-Construction): sought to collect information on the numbers and time involved in preparing the financing and contracts (PPA, Turbine Contract, Civils and Electrical Construction Contracts, Funding Documents etc) for the development of a wind farm.
6. Construction and Supply Chain: sought to collect information in relation to the construction of the wind farm and the different firms required to complete the construction and the typical length for such a construction. It also sought to identify any blockages in the supply chain for the necessary parts for the construction, installation and maintenance of wind farms.
7. Employment and Skills Supply: sought to collect information on any shortages in skills or specialist professionals available and reasons for such shortages if any and potential solutions to overcome these shortages.
8. Continuing Operations: sought to collect information on the ongoing numbers requirements to maintain a wind farm from both a technical and administrative reporting (financial, compliance etc) perspective.

The questionnaire was complemented with in-depth interviews. These interviews were carried out either face-to-face or by phone. The interview aimed to collect all the information identified in the questionnaire but also any other items which may have been overlooked and which have a consistent impact on the numbers involved/employed in the sector.

Although a number of companies were not available for interview and as such, a limited pool of data was available from completed interviews, all responses were relatively consistent across the parties that were interviewed when reviewed across the three categories of the Study: small onshore wind farm (c. 5MW); large onshore wind farm (c.20MW) and offshore wind farm. It was discussed and agreed with the participants that wind farms could be grouped by size in relation to the volume of investment required and the number of people required to complete each element of the development and construction of a wind farm (feasibility, planning, finance and legal, construction and operation). Responses from participants were grouped by these three sub-groups and information was assimilated for each sub-group when compiling the results of the Study.

Using the employment information provided in the interviews, we built up an estimate of the number of jobs required to plan, construct and operate the 7,800 MW targeted to be installed on the island of Ireland by 2020 and re-power current installations as required. The employment numbers were applied on the basis of the three sub-groups and the split of the target MW by category of size as set out in Table 3.

Table 3

MW Employment Number Categorisation

Category	Number of MW	Small Onshore	Large Onshore	Offshore
Category 1	0 – 4.9 MW	✓		
Category 2	5 – 9.9 MW	✓		
Category 3	10 – 14.9 MW	✓		
Category 4	15 – 24.9 MW		✓	
Category 5	25 – 34.9 MW		✓	
Category 6	> 35 MW		✓	✓

Source: IWEA and Deloitte Study

Following the estimation of employment figures by MW for each category, we calculated the potential employment figures for those positions which support the sector in general, such as:

- Microgeneration;
- Research & Development
- Policy Agencies (such as Irish Wind Energy Association (IWEA), British Wind Energy Association (BWEA), National Offshore Wind Association of Ireland (NOW), Irish Business and Employers Confederation (IBEC), Meitheal na Gaoithe), Confederation of British Industry (CBI)
- Support & Administrative Staff in Companies involved in Wind Sector
- Irish Firms involved in Wind Energy Sector but developing wind farms abroad.

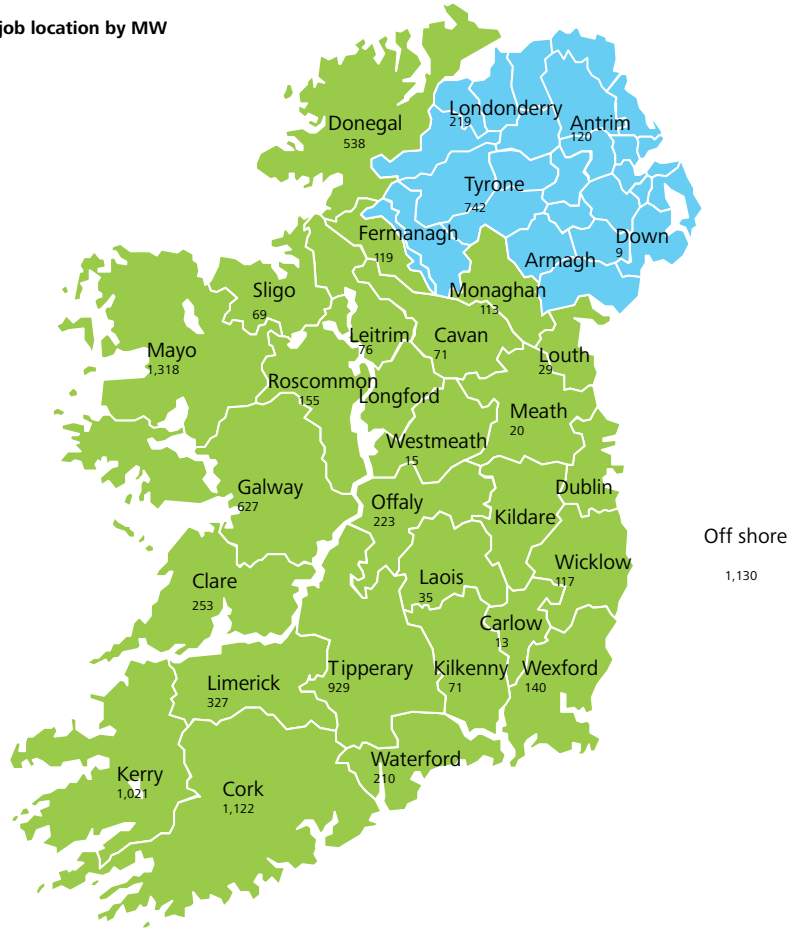
There were a number of other areas within the sector which we were not able to quantify the related employment contribution but which we expect to have a significant contribution to the numbers of jobs supported by the Irish Wind Energy Sector in the coming years. These are not included in the job estimates in this report. These are outlined further in Section 4.

4. Estimate of Employment Potential

Our analysis has shown that the wind energy sector in Ireland can support 1.50 jobs per MW to be installed on the island, resulting in just over 10,760 jobs being available across the sector up to 2020. This number includes construction operation and maintenance of all wind farms and assumes a steady growth in the industry over the period to 2020. Employment involved in planning, financing, constructing and maintaining MW and wind farms provides 1.37 jobs per MW to be installed. Support services such as administration, payroll and marketing/communications will provide 0.13 jobs per MW to be installed. The location of the MW and the jobs attached to their development totalling 9,831 of the potential jobs is shown in Figure 12. The estimate of employment figures does not take into account any ancillary service industries in the locality of the wind farm which would benefit from the construction of the wind farm and the presence of the people required to get the wind farm developed.

Figure 12
MW to be installed and Corresponding Employment

Estimated job location by MW



Source: IWEA

The outcome of our analysis is comparable with the results found by a study undertaken by the BWEA in relation to jobs in the UK wind energy sector by 2020 (1.33 jobs per MW installed) and the EWEA Study (for non-manufacturing related jobs).

By the nature of the source of energy harnessed in wind farms, wind farms tend to be located in outlying areas of the county. This is reflected in the employment numbers being widely dispersed around the country, focussed mainly in Connacht and Munster as outlined in Table 4.

Table 4
Employment Numbers by Province

Connacht		
County	MW	Jobs
Galway	399.81	629
Mayo	840.89	1,318
Roscommon	98.75	155
Sligo	43.9	69
Leitrim	48.5	76
Total	1,431.85	2,245

Leinster		
County	MW	Jobs
Carlow	8.12	13
Dublin	-	-
Kildare	-	-
Kilkenny	45.58	71
Laois	22.13	35
Longford	-	-
Louth	18.23	29
Meath	12.65	20
Offaly	142.49	223
Westmeath	9.75	15
Wexford	89.27	140
Wicklow	74.62	117
Total	422.84	663

Munster		
County	MW	Jobs
Clare	161.57	253
Cork	716.05	1,122
Kerry	651.55	1,021
Limerick	208.57	327
Tipperary	592.21	929
Waterford	134.06	210
Total	2,464.01	3,862

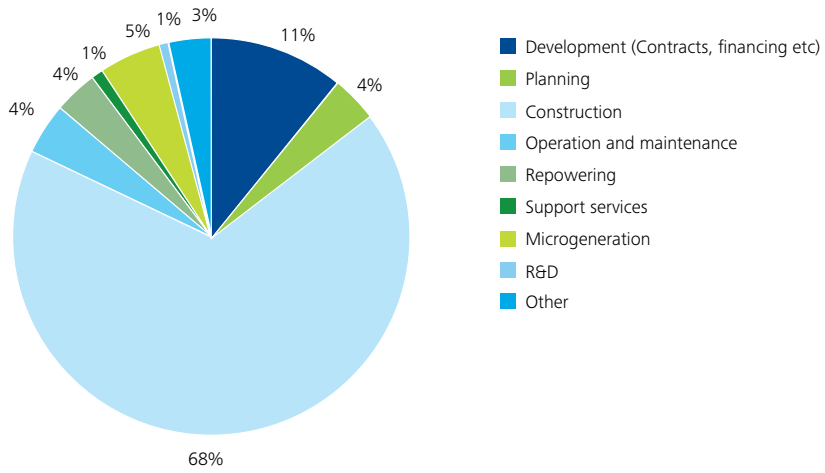
Ulster		
County	MW	Jobs
Antrim	138.35	120
Armagh	-	-
Cavan	45.32	71
Derry	264.62	219
Donegal	343	538
Down	7.5	9
Fermanagh	166.21	119
Monaghan	72.09	113
Tyrone	720.31	742
Total	1,757.4	1,931

Off shore		
	MW	Jobs
	720.89	1,130

In addition to these employment numbers estimated by MW, there are further employment opportunities available in other areas of the Sector relating to policy; Research & Development; support services and other which total to 935 potential jobs.

Construction provides the majority of the jobs opportunities available from the wind energy sector. Offshore wind development requires significant construction inputs in order to develop the large scale wind farm projects planned. The scale of expected development in both onshore and off shore, the wind sector offers great opportunities to a sector such as construction, which is currently facing downturn and rising unemployment. It is estimated that approximately 7,258 jobs will be supported by the construction element of wind farms. Construction includes civil engineering, electrical engineering, labouring, project management, health & safety, turbine transport and cranes and further environmental analysis required to satisfy planning conditions. Also included within these figures are employment numbers in relation to ESB Networks and NIE in relation to the grid connections work required at each wind farm.
These estimates do not include turbine installation as it was found during the course of the interviews that the international turbine companies typically install turbines in Ireland using their own internal teams rather than sub-contracting to local Irish firms.

Figure 13
Irish wind jobs by category



Source: IWEA and Deloitte Study

The next largest category is Development with 1,182 estimated jobs. The tasks included in this phase are financial advice & lenders involvement in relation to the financing of wind farm and legal advice in relation to all of the necessary contracts (Turbine Contract, Civils Sub-Contract, Electrical Sub-Contract, Finance Documents etc). The category also includes work done at the feasibility phase in relation to initial wind assessment and negotiation of lease with landowners.

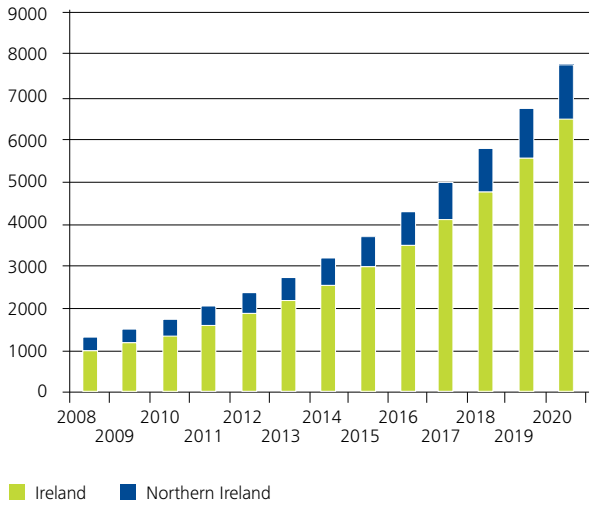
Microgeneration is estimated to provide c. 5% or 578 of the potential jobs available in the sector. We have included only initial estimates for installations over the next five years, 4,500 across the entire island of Ireland. Only 500 installations have been assumed for Northern Ireland, due to current planning permission restrictions and a poor tariff scheme. We would expect that this Northern Ireland number could be doubled in the coming years but would not expect growth larger than this in the absence of a change in the regulatory environment. This element of the sector has the potential to provide significantly more jobs during the period to 2020 than assumed in this Study.

The Other category relates to landowners who typically, depending on the size of the site leased to wind farm operators and the number of turbines on the site, will receive €20,000 - €30,000 per annum in rent. This can be significant income to a landowner who may have had no other /limited economic use for the land that is then leased to a wind farm operator. Also included in this category are agencies (IWEA, BWEA, NOW, Meitheal na Gaoithe, IBEC, CBI etc.) and local firms who are developing projects abroad.

4.1. The Importance of Steady Industry Growth

The study assumes that there will be a steady growth in the amount of MW rolled out between now and 2020. Figure 14 shows the growth paths for both Ireland and Northern Ireland growing by 13 and 16 percent year on year respectively[4]. It is crucial that the industry expands at a sustainable rate. If Ireland's increase in installed capacity is rolled out at a steady growth rate over the next 11 years then Irish companies will have sufficient time to adapt and build up their companies in order to cope with the increasing number of MW being added every year.

Figure 14
Steady Growth MW Roll Out

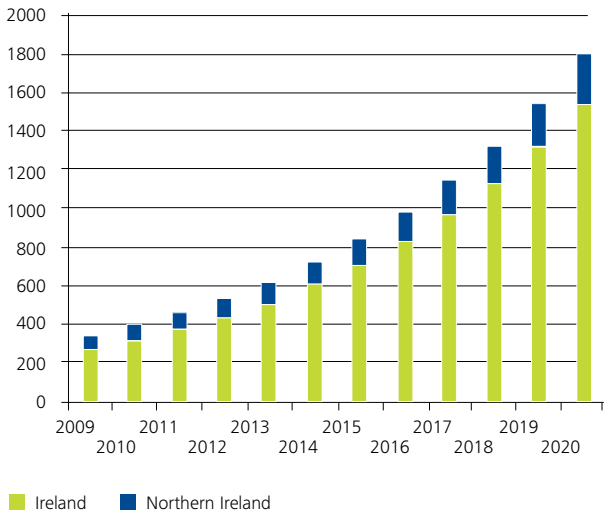


Source: IWEA and Deloitte Study

[4]Assuming 6,500MW in Ireland and 1,300 MW in Northern Ireland

Given this level of industry growth, it is estimated that over 10,760 jobs will be attributable to the wind industry over the next 11 years with over 1,800 jobs to be created in 2020 alone. This corresponding growth in job creation can be viewed in Figure 15.

Figure 15
Annual job creation with steady MW growth Ireland and Northern Ireland



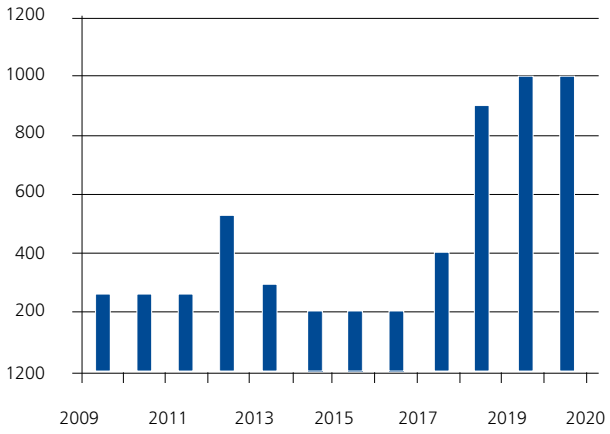
Source: IWEA and Deloitte Study

The increase in jobs as indicated in Figure 15 is indicative and indeed follows the path of industry growth. As more turbines are installed there will be more work in operations, maintenance and repowering of the installed capacity as well as significant construction activities with new developments.

It also should be noted that there will perhaps be additional jobs in the manufacturing of micro generation turbines that may not follow a steady growth trajectory but may in fact be created in discrete phases. This is something that will transpire in the years to come with support for this sector.

What must be recognised however; is that unless the current institutional barriers to the steady growth of wind energy are removed, many of these jobs will be lost. It is essential that grid upgrades are delivered in a timely manner and that planning issues are addressed. Otherwise Northern Ireland and Ireland will be attempting to grow and contract the industry in very short periods of time. Local companies will simply not be able to adapt and invest fast enough to capture the sudden change in business volume.

Figure 16
Current projected roll out of capacity (Ireland)



Source: IWEA and Deloitte Study

"...unless the current institutional barriers to the steady growth of wind energy are removed, many of these jobs will be lost"

Figure 16 illustrates the estimated additional capacity year on year which will be connected based on the current predicted roll out of the additional grid infrastructure need by 2020. A similar pattern is expected in Northern Ireland and this will be easier to quantify following the conclusion of the Strategic Energy Framework and the strategy for upgrading the transmission system. The most significant aspect of this graph is the irregularity of capacity added every year. The consequence of this will be that in 2017[5], the Irish wind industry will have to try and expand its delivery capacity 3-fold in the space of 2-3 years. This rapid expansion is likely to be practically not possible and this will mean that Irish developers will be forced to import services, such as transport, crane hire, electrical services etc. from abroad. If this scenario is realised it will mean that a large portion of the benefit to be gained from the expansion of the Irish wind industry will be lost from the local economy.

4.2. Other Employment Opportunities

There are a number of other opportunities for job creation and investment in the wind energy sector being researched and assessed. These include:

- Grid development and upgrade works in Ireland in line with GRID 25
- Grid development and upgrade works in Northern Ireland
- Port and Warehousing related activities
- Activities related to the development of an East-West Interconnector between Wales and Ireland. An additional interconnector between the UK and Ireland is also likely.
- Electric Transport
- Pumped Storage
- Energy Exports
- Demand Side Management
- Integration of the ICT and Energy
- Projects and Developments in addition to the 6,500MW required to meet national targets, both within and outside the current Grid Application Process.

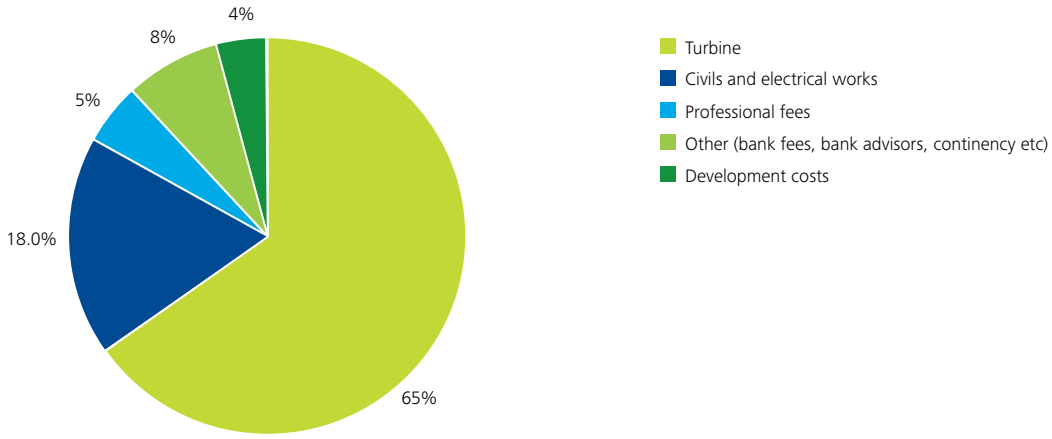
These are very exciting proposals and will assist greatly in achieving Ireland's 2020 renewable energy targets. These proposals are early stage and information is not available to accurately calculate the number of jobs that will arise from these proposals although it is clear that they will contribute positively to the green economy and the jobs therein.

[5]When it is estimated that a significant upgrade of the transmission system will be completed

5. Investment Contribution

As outlined previously, all large scale turbines are imported from the continent and typically the turbine manufacturers use their own teams for the installation of the turbines rather than using local contractors. From analysis of the cost of the construction of operating wind farms and from the interviews, we have analysed the split of the construction costs into a number of categories as outlined in Figure 17.

Figure 17
Investment cost by category



Source: IWEA and Deloitte Study

It is important to remember that in addition to the 6,500 MW targeted to be installed across Ireland by 2020, the existing, installed 1,300 MW must be retained to achieve the overall target. Certain wind farms which have been operational for a number of years will be required to be re-powered or decommissioned during the period to 2020.

Between the cost of developing and constructing the target MW to be installed and the re-powering/ decommissioning of existing MW, there is c. €14.75 billion of investment arising from the Irish Wind Energy Sector. It is estimated that this breaks down into c. €12.5 billion investment in Wind Energy in Ireland and c. €2.25 billion investment in Wind Energy in Northern Ireland.

Our analysis suggests that only 35% of the investment in the development and re-powering of wind farms will be retained within Ireland, as all investment in relation to turbine manufacture and installation is exported to Continental Europe. This represents a potential investment for the Irish economy of c. €5.1 billion based on average investment of c. €2.07m per MW (assumed average between onshore, offshore and re-powering costs).

Of the c. €5.1 billion, c. €4.33 billion is estimated to be invested in Ireland and c. €786 million will be invested in Northern Ireland.

6. Profile of Jobs in Sector

There is no classification of roles within the wind energy sector but in Table 5 we have summarised the different skills and jobs which are required in the development and construction of wind farms.

We have included Manufacturers in the profile, although currently there are no direct manufacturing jobs available in the country in relation to the manufacture of large scale turbines.

Table 5
Job Profile

Type of Company	Field of Speciality	Skill Profile
Manufacturers	Wind turbine producers including major sub-components such as blades and assembly of parts.	Chemical, Electrical, Mechanical and Materials Engineers liaising on R&D, design, management and quality control of production process. Non-skilled workers for assembly line. Technical staff for operations and maintenance of turbines. Other support staff (admin, payroll, sales, marketing etc).
Developers	Managing all aspects of the development of wind farms (feasibility, planning, financing, construction and operation)	Project Managers to co-ordinate process. Environmental engineers and other specialist engineers and advisors to assess the environmental aspects of the development. Meteorologists to develop prediction models and analyse wind data. Financial and legal professionals. Other Support staff (admin, payroll, sales, marketing etc).
Construction and O&M	Building the wind farm and providing ongoing maintenance work.	Technical staff for ongoing maintenance of the wind farm. Electrical and civil engineers to complete the design and management of the works. Health & Safety Experts Transport specialists. Semi-skilled and non-skilled workers for the construction phase. Other Support staff (admin, payroll, sales, marketing etc).
Utility Companies	Sale of the electricity produced	Financial and Legal People Other Support staff (admin, payroll, sales, marketing etc).
Consultancy Firms – Financial, Legal, Insurance, Engineering, Funders etc	Advisory services to all elements of the sector.	Meteorologists to develop prediction models and analyse wind data. Environmental engineers. Financial and Legal Advisors Policy Experts. Other Support staff (admin, payroll, sales, marketing etc).
Source: Deloitte and IWEA Study		

As outlined in Section 4, the majority of jobs available in the Wind Energy Sector lie within Construction. The next largest section relates to the consultancy/ advisory firms that provide advice and assistance to the Wind Energy Sector across a wide range of specialities and skills.

During our study, most interviewees stated that hiring skilled personnel had been difficult over the last number of years but that it had been improving over the last eighteen months for most categories of personnel except for electrical engineers. Hiring of suitably qualified electrical engineers is difficult due to the low numbers participating in electrical engineering degree courses in the country.

In the following pages, we have included a profile of people who are currently involved in the Irish wind energy sector on a day-to-day basis. These profiles prove a snapshot of the activities undertaken in the sector and the diversity of skills required.

Justine Ryan – Airtricity – Acquisition Executive

Justine Ryan has worked with Airtricity for over 5 years, starting initially as a graduate Market Analyst and then moving into a Development Project Manager role in Northern Ireland where she was responsible for the managing of wind farm projects covering the project lifecycle including site identification, EIS, planning process, approvals and handover to construction.

In January 2006, she moved to the role of an Acquisition Executive on the Business Development Team which involves acquisitions and partnerships on wind projects throughout the island of Ireland (Ireland and Northern Ireland). Airtricity's main objective is to maximise the amount of electricity produced from renewable sources in a safe and sustainable way. This is done by development of their own portfolio of projects but also through a number of acquisitions and partnerships.

Justine travels extensively around Ireland on various projects but is based in Airtricity's Castlebar office which was set up in July 2008 as Airtricity's first field office in Ireland outside Dublin (second was subsequently set up in Killarney). She lives in Mayo with her husband and her 3 year old child. Justine finds her current role in Airtricity provides her with excellent flexibility to manage the work life balance

Ferga Kane – Deloitte Corporate Finance – Financial Advisor

Ferga Kane is part of the dedicated renewable energy team in Deloitte and has been involved in the Wind Energy Sector for over five years. Ferga obtained a Bachelor of Commerce from UCD and a Masters in Business Studies from the Smurfit School of Business. She is also a fellow of the Institute of Chartered Accountants in Ireland.

Services provided by Deloitte have related to the raising of project finance and equity for developers as part of the development of individual wind farms. This work involves the development of a financial model which projects the cashflows of the wind farm so that it can be used to secure the necessary funding from potential providers of debt and equity and subsequent negotiations with potential funders (debt and equity). With the recent consolidation of the market, Deloitte has provided advice in relation to acquisitions in the Renewables Sector, particularly in the Wind Sector; either acting for the Vendor or Purchaser. Services provided include due diligence, management of sale process, financial modelling, negotiation of terms including consideration and debt terms and tax structuring advice.

The challenges provided by the global downturn have had an impact on finance raising across all sectors, however wind energy remains an attractive asset class. Whilst the next couple of years will be challenging, the political targets; appropriate incentives and regulatory processes in place should encourage continued growth in Ireland and ensure that the wind sector in Ireland still provides significant opportunities. Ferga and Deloitte expect to continue its ongoing involvement in the sector, bringing appropriate advice and expertise to the market participants.

Ross McEvoy – Service Technician – Enercon Wind Farm Services Limited

Ross performs maintenance and fault finding operations on ENERCON Wind Turbines. Based in the service office in Gorey, Co. Wexford, Ross and 5 other technicians perform cyclical maintenance on each ENERCON turbine in their maintenance area. Each turbine is scheduled for a maintenance check 4 times a year. For Ross this translates to about 4 turbine visits a week for his two-man team as they guarantee 97% availability. In collaboration with the electronics engineers, their task is to ensure that ENERCON wind turbines remain in good working order. Excellent insight to turbine mechanics and an ability to pinpoint possible sources of error are essential qualities.

Ross has been working with ENERCON for four years now. He had previously been employed in the industrial manufacturing, but having witnessed the gradual contraction of opportunities in the sector, he decided to explore more opportunities in the renewable energy sector. Ross always had a keen interest in renewable technology and viewed it as a promising growth area. Day to day work is always interesting and every day brings a different site with a different challenge. Three quarters of the team's time is devoted to regular maintenance checks and in addition to that, they support the electronics engineers in troubleshooting fault messages, carry out maintenance on new installations after the initial 300 hours of operation and look after updating machines.

Lorcan McEvoy – Enersol – Operations Manager

Lorcan has been working with Enersol for just over a year, having come from a varied background which includes electrical contracting, agriculture, construction, switch gear design both motor control for water and sewage industries, and heavy distribution for large industry.

Enersol is an electrical engineering company providing a number of services including professional and affordable electrical engineering services for power Medium and Low Voltage distribution systems and Lorcan finds working with Enersol in the wind industry both rewarding and very challenging.
In his role as Enersol's Operations Manager with responsibility for a number of in house departments including Engineering. Research and Development. Production. Procurement and IT.

Along with their dedicated Field Service Department, Lorcan has had the opportunity to gain invaluable experience and a detailed understanding of both customer and industry requirements.

Gary Connolly – Northern Ireland Projects Manager – ESB Wind Development

ESB Wind Development is one of the leading wind farm development companies in Ireland and Gary Connolly looks after the Northern Ireland operation. "My role is essentially to take each project from the very early concept stage and manage it to a point whereby the construction team can build a viable wind farm. There are many uncertainties in the initial phase of a project, for example landowner agreements, planning permission and grid connection, and it's up to me to make sure that these are all resolved prior to the construction phase."

In common with many others involved in wind farm development, Gary didn't start his career in this industry. "My background is in agricultural engineering and my early career was spent working on technology transfer in the wider agricultural sector. In later years there was an increasing focus on renewable energy projects on farms and so it was a natural progression for me to become involved in wind farm development."

Gary enjoys the variety associated with the job as well as people he deals with on a daily basis. "It's all about communication. I regularly interact with landowners, engineers, suppliers, consultants, politicians, planners, accountants, contractors, solicitors, community workers and others. It's important that I manage the communication process so that each stakeholder gets the information and analysis that he or she needs from me."

Feilim O'Caoimh – McDowell Purcell Solicitors– Solicitor

Feilim O'Caoimh is a partner with McDowell Purcell Solicitors (MDP). He is head of the commercial law unit and is recognised as a leading legal practitioner in the wind energy sector, having worked in the area for over 11 years.

During this time Feilim has worked with many of the most significant developers, funders and investors in the wind farm sector. He also advises independent wind farm developers on project finance / construction, and project / portfolio sale. This latter aspect has been undergoing a well publicised consolidation with large utilities and State owned entities acquiring individual wind farm projects and portfolios of projects. MDP's commercial unit provides a full service offering to wind farm developers, funders, contractors and consultants on all aspects of wind farm development.

Feilim has been a Council Member of the Irish Wind Energy Association since 2002 and is a member of IWEA's Public Affairs Committee. Prior to joining MDP, he was Director of Energy at a large Dublin commercial law firm. Feilim is included in the most recent edition of Chambers Europe Directory of leading lawyers where it was observed that "his expertise and contacts are key attractions for clients".

Feilim recently commented that in the current market, project finance is becoming increasingly difficult to procure. Where it is obtained such finance is being granted on more onerous terms, not just from a commercial / financial perspective, but also from a legal perspective. Due to current economic conditions and changes in the banking sector over the past year, lenders are far more cautious in their approach to project finance. Despite this fact Feilim believes that the number of lenders active in the market will increase over the next 12-18 months.

Andy Durkin – Heavy Crane Operator – Windhoist / McNallys Crane Hire

Andy has been employed in McNally's Crane Hire in a full-time role for two and a half years as lead operator on their Terex-Demag TC 2800-1 heavy lattice boom crane, the most common crane model used to erect 2 to 3MW wind turbines onshore in Europe. Andy was well known to McNally's before joining the company as an experienced crane operator (tower and mobile), a skilled tower crane technician and an experienced truck driver. Andy is assisted by another crane (plus operator), three rigging personnel and two truck drivers from an external haulage contractor.

One of his principle roles is to manage the erection, dismantling and movement of the crane on wind farm sites, controlling the rigging personnel and coordinating the transport interface in this procedure. On more difficult sites, e.g. floated roads or adverse gradients) Andy is expected to assess the condition of the road running surface before moving the crane from one turbine location to another and to recommend any upgrading work he feels is necessary.

Wind farms are acknowledged as very challenging sites on which to work – they even experience a phenomenon called "horizontal rain"! However the work is more varied, interesting and infinitely more challenging than conventional site work and all McNally's operatives acknowledge this fact. McNally's experience little or no staff turnover – only new entrants. Andy has worked without incident on the Kilgarvan project (Vestas/SWS), Inchee Midas (Vestas/Murnanes), Lisheen Mine (Vestas/SWS), Coomacheo (Siemens Wind Power/Airtricity), Slieve Rushen (Vestas/Quinn group) and numerous projects in the UK. He is currently commencing work on the Curragh Mountain Windfarm for Siemens Wind Power/Airtricity.

Fionna O'Regan – Principal Engineer – Fehily Timoney & Company

Fionna is a Chartered Engineer, holds a Master's Degree in Civil Engineering, and is a renewable energy specialist. She has particular expertise in all aspects of wind farm planning and design, and has carried out work on over 50 wind farms in Ireland to date. This work includes feasibility studies, wind monitoring and analysis, preliminary wind farm design, environmental impact assessment, planning applications, grid connection applications, CER licences and authorisations, due diligence work, and the project management of detailed design services.

Fehily Timoney & Company is working in the Irish Wind Energy Industry since 1999. They have a dedicated Renewable Energy team working full-time on wind energy projects. Work at Fehily Timoney & Company is immensely varied. Fionna's role of Principal Engineer for the Renewable Energy Group means taking responsibility for the renew able energy projects for the company, as well as overseeing budgets, resourcing, and staffing matters.

7. Challenges and Potential Solutions to Achieving 2020 Target

In recent years, Ireland has established a number of initiatives to stimulate the growth of the sector such as financial (REFIT), grid connection (GRID25 Study) and planning (Strategic Infrastructure Act) amongst others. However, despite these actions, the sector still faces significant challenges. The contributors to this Study identified the following main concerns:

• Grid Availability

Typically, grid capacity is limited in the areas where there are good wind resources. Getting significant transmission capacity built out to these areas, typically outlying areas of the country, is expected to take 7 to 10 years to complete. The provision of connection to the grid is currently the largest obstacle and time delay faced by Developers in constructing their wind farms. It will be essential to improve community awareness and acceptance of the benefits of transmission to ensure that the grid can be delivered in a timely fashion.

• Shortage of Experienced Personnel

The pool of people available with the relevant experience is limited. This is partly due to the fact that the Irish Wind Energy Sector is still relatively young and that the sector has not been able to attract experienced professionals from other jurisdictions to locate in Ireland. As wind energy sectors in other countries continue to grow and grow at a greater rate than Ireland, it will become harder to attract or retain these experienced professionals. It will also be necessary to increase investment in training and development of local people.

• Lack of Awareness of Opportunities

Another key concern raised by the interviewees/ contributors was the low number of students in relevant courses (particularly electrical engineering) and not the courses on offer in Irish universities and colleges.

There also seems to be a gap in the awareness of the opportunities in secondary education. Although many students are now very aware and keen to be involved in the green economy, there is little information or courses available to them in their schools that outline the number of career opportunities available to them in this sector.

• Financial Framework

The current financial framework for wind development in Ireland allocates many risks to developers. These include delays and risks of cost overruns on connections, changes to regulatory parameters that impinge on commercial viability as well as more standard market risk. In the current market where project finance is becoming increasingly difficult to procure, a focus on these issues is now more than ever required.

• Offshore Operations

There is only one offshore wind farm currently in operation in Ireland, although over 2 GW of offshore wind farms are planned. Offshore wind farms by their location face unique challenges due to the hostility of the environment in bad weather, tidal activity and the poor access to many of the sites. These issues hinder and delay the development period when developers are undertaking their environmental analysis for planning. The current planning process in relation to offshore operations also provides certain obstacles and time delays.

All of these issues will need to be tackled to ensure the Irish Wind Energy Sector can continue to flourish, allow Ireland to meet its EU targeta, and assist the Government with its recovery plan. Proposed to the Planning Regulations as released on 28 May 2009 are all welcomed as too are initiatives such as Green Schools and the establishment of a Green Economy Taskforce consisting of a number of Irish enterprise bodies.

"It will be essential to improve community awareness and acceptance of the benefits of transmission to ensure that the grid can be delivered in a timely fashion"

Appendices

Appendix 1 - Assumptions

Assumptions

A number of assumptions were made at the time of agreeing the scope of the Study and the commencement of the process. We have outlined the key assumptions here:

- To reach the 2020 target, projects equivalent to all of Gate 2 Contracted and Gate 3 applications in Ireland will be approved and installed. Microgeneration in Ireland will equal 4,000 installations equating to 34 MW. In the North, 1,000 MW will be installed up to 2020 with an additional 4.25 MW generated from 500 microgeneration installations.
- All additional MW required to reach the 2020 target are included within the Study on a pro-rata basis of size and location based on the existing Gate 2, Gate 3 and Northern Ireland planning process.
- That people involved in the feasibility, planning, pre-construction, construction and operation phases of the wind farms are located in line with the location of MW. This will be true for a large amount of resources involved in the development of the wind farm but some of the professional providing advisory services may be located in other towns/cities but it is not possible to identify their location without knowledge of the exact advisors which would be used in each project.
- All grid upgrade works will be completed by the system operators and asset owners to allow for the connection of these applications. Although no employment numbers have been included within the Study as these have yet to be quantified by the system operators and asset owners.
- All onshore wind farms above 15MW will require the same number of inputs to be developed and constructed with the average construction period being 8 months.
- All onshore wind farms below 15MW will require the same number of inputs to be developed and constructed with the average construction period being 3 months.
- That the wind farm site is not a virgin site; has a level of infrastructure in place; does not require deep piling and certain access roads are available to the site.
- When a range of responses was received, the average was taken of all responses for use in the Study. When an interviewee provided a range as an answer, the mid-point was assumed for use in the Study.
- Assumed that one/two people are required to complete the work needed to complete each chapter of the Environment Impact Study with one person overseeing the development of the study.
- Assumed that each stakeholder in the planning process spends 2 days on each application for onshore permission and 4 days for offshore permission. There are 18 stakeholders involved in Ireland process and 30 stakeholders in the Northern Ireland process.
- Assumed that 44 man-weeks represent one job allowing for holiday leave, bank holidays, adhoc leave and sick leave.
- Assumed that re-powering requires the same elements as a wind farm construction except for the initial feasibility work, initial civils and grid connection. Assumed that inputs are only 80% of those for a construction project taking into account the cost of dismantling.

Appendix 2 - List of Interviewees and Contributors

Airtricity
An Bord Pleanála
Bord na Mona
British Wind Energy Association
CER
Coillte
Deloitte
DP Energy Ltd
Dundalk Institute of Technology
Ecoevolution
Electricity Research Centre
Energia
ENERCON
Enersol
ESB Networks
ESBI / Northern Windpower
Fehily Timoney & Company
Gaelectric
Gamesa

IWEA
John Sisk & Son
Kilronan Wind Farm
Kirby Group
Mainstream Renewable Power
McDowell Purcell Solicitors
McNallys Crane Hire
Meitheal na Gaoithe
Murray Consulting
Northern Ireland Planning Service
Oriel Windfarm
RES UK & Ireland Ltd
Scan Energy and Environmental Services Ltd
SONI
Spirit of Ireland
Surface Power
SWS Energy
TCI Renewables
Wind Prospect

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The Irish Wind Energy Association is the national association for the wind industry in Ireland and it is committed to education and awareness building to promote the development of a sustainable energy system and thus contribute to a cleaner environment by reducing the demand for fossil fuels. Founded in 1994, the association's membership has grown to over 400, representing energy developers; turbine manufacturers, construction companies, and many other supporting service sectors. IWEA is primarily a policy driven organisation, with a large proportion of its activities devoted to lobbying and policy development. The association also promotes the development of shared knowledge and experience within the industry at its conferences and through its training programmes.