

# Wind Energy



**Ireland has the capacity to generate electricity at some of the lowest prices in Europe with major environmental benefit and export potential. This is because of ideal wind speeds, good roads, ports, electrical infrastructure and skilled workforce with over 1300 wind turbines erected to-date. These contribute about 20% of our electricity from the wind.**

**In some EU countries such as Denmark, it has been possible for farmers and local communities to invest in a local wind project to contribute to their own electricity supply. By looking at the success of other European farmers, it is clear that developing a wind farm has the potential to be a successful alternative farm enterprise.**

## THE MARKET

Wind energy is the source of energy that dominates the market of renewables in Europe. However, even though Ireland has one of Europe's best wind regimes, we have been slow to harness the full potential. There are many obstacles for the future of wind energy as a supplement to other sources. However, wind energy has real potential. If you are a land owner with a suitable location there is potential to offer a good long-term return on investment, through the sale of electricity to the network. The future growth prospects of wind power in Ireland are reliant on creating a reliable national market. The Irish Wind Farmers Association is an organisation which aims to promote and facilitate the development of small to medium scale projects promoted by both individuals and communities. See [www.mnag.ie](http://www.mnag.ie) for more information.

## STEPS IN BUILDING A WIND FARM

### 1. Identify Sites with potentially good wind speeds

The fact that a site is windy does not mean it is suitable for wind power development and other factors need to be considered. A site with wind speeds of 8 metres per second or higher is classed as ideal, although improvements in turbine technology are making this less critical. Local wind speed estimates are available from [www.seai.ie](http://www.seai.ie). Local measured wind data is available from Met Eireann. If you are confident that you have viable wind speeds a reasonable chance of planning and a grid connection you should commence wind speed measurement using a meteorological mast. These are planning exempt for a height of up to 80m and a period of 18 months. At least 12 months of hard data will be required followed by the correlation of the data with long term trends.

### 2. Determine Proximity to Existing Transmission Lines

Turbines require a physical electrical connection to the electricity grid. The distance from potential sites to the nearest suitable connection point on the grid should be estimated and

the cost of same. New grid connections can cost hundreds of thousands of Euro per kilometre. Determine if there is access to ESB Networks or Eirgrid close by (within 10 km, the closer the better) and if the proposed site will affect communication systems.

### 3. Secure Access to Land and Address Siting and Project Feasibility

Suitable sites are usually in areas with some elevation or are located close to the coast and without obstacles. Topography, Geology, and access must be taken into account. Ground conditions at the site should be investigated as the installation of turbines involves movement of heavy goods and use of cranes.

### 4. Consider the Environment

Study all environmental information relevant to the site especially County Development Plans and national planning policies and wind energy planning guidelines. Discussions with local planning officers and established wind farmers are important. Consider if the turbines could be visually obtrusive or actually enhance the area. Check the distances to the nearest dwellings. The nearest dwellings should be more than 500 metres from a turbine. Take into consideration noise emission potential. (Typical noise levels from a wind farm 350 metres away are 35-45 decibels under the worst case conditions, although larger machines will require further setback to achieve this noise level). Considerations should also be given to sensitive habitats and species such as bats or corncrakes. Examining these factors will help you decide whether a potential site is worth pursuing. Proximity to a Special Area of Conservation is likely to create planning challenges.

## IDENTIFY RELIABLE POWER PURCHASE OR MARKET

Wind is the most competitively priced energy technology currently in the market. Energy wholesale companies buy electricity from wind farmers under a power purchase

agreement, or various other market options. When establishing wind farms, wind energy developers generally approach landowners where they want to build. However, you can contact these companies directly. A map with boundary limits initially needs to be sent into the company who will then assess if the site is suitable.

## ECONOMICS OF WIND ENERGY

There are many factors contributing towards the cost and productivity of a wind farm. Quality turbines of any scale are not cheap. A good quality 5kW - 6kW turbine will cost over €25,000 to purchase, install and connect. A well maintained good quality 6kW unit in an excellent site will produce around 13,000 units of electricity per annum.

13,000 kWh would have the value of around €2400 if all of the units produced were consumed onsite and the site was supplied by ESB CS with the 24-hour rate (rather than the night-saver). However a typical house in Ireland might consume around 5,500 units of electricity per annum and not 13,000. The electricity generated would have the value of €1760 if the turbine matched demand for 3,000 kWh of a typical houses demand (at 18.6c/kWh per unit). The house would then still have to import 2,500 kWh at 18.6c/kWh (or €465 worth of electricity).

## PLANNING PERMISSION

Visit local authority energy agency office and check possibilities and requirements. (Available from local county councils.) Are

there wind farm developments already operational in the area or are there developments granted planning permission close by? There is a statutory requirement for an environmental impact statement for potential developments greater than 5 turbines or 5MW.

## COSTS

Wind farms are expensive to develop and investment costs are around €1.4 million per megawatt installed; typical wind turbines range from 1.5 to 3MW in size. But they can offer a good return on investment. If this level of investment is too high for a landowner, then another possibility is to grant an option to lease the land to a private company, who will develop and manage the wind farm. Otherwise investing in a single wind turbine with other farmers and supplying the local community with electricity could be a good alternative route. Installation costs for farm-size wind turbines where the power is consumed onsite are lower than for turbines exporting to the grid and may be a less costly option.

The prices to be paid under the existing Renewable Energy Feed in Tariff (REFIT) Programme index-linked for the first 15 years of operation are:

- Large Scale Wind category €69/megawatt hour (MWh)
- Small Scale Wind category - €72/MWh

Note that REFIT is not open to applications since 2015 and the future of renewable electricity supports is currently subject of ongoing consultations by the Department of Energy.

### Links

Department of Communications, Energy and Natural Resources [www.dcenr.gov.ie](http://www.dcenr.gov.ie)  
Irish Wind Farmers Association [www.mnag.ie](http://www.mnag.ie)  
Tom Bruton BIOXL [www.bioxl.ie](http://www.bioxl.ie)  
Sustainable Energy Authority Ireland [www.seai.ie](http://www.seai.ie)  
Commission for Energy Regulation [www.cer.ie](http://www.cer.ie)  
Irish Wind Energy Association [www.iwea.com](http://www.iwea.com)

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