

WIND ENERGY

Wind farm

TRALEE

(Ireland)

Wind energy is not the energy source that immediately comes to mind when thinking about renewable energy in cities. Few cities have enough space within their area to build large wind farms. You may rather find small wind turbines on suitable locations within the city's area or see cities doing feasibility studies on this subject. However, in Ireland was developed a wind farm of approximately 15 MWe, only 8 km away from Tralee. This project is a partnership of an Irish and an English company.

THE CITY

Tralee lies on the south-west coast of Ireland at the gateway to the Dingle Peninsula. It is the capital town and administrative centre of County Kerry, Ireland's premier tourism county. With its population of about 25.000 people, Tralee has nearly the 20% of County Kerry's population of 126,000.



CONTEXT

Tursillagh project is Ireland's largest wind farm, located approximately 8 km from Tralee, in the South West of the Republic of Ireland. Tursillagh Wind Farm Ltd is a 50/50 joint venture between Powergen Renewables and Saorgus Energy Ltd of Ireland. It is the first wind farm built from this partnership, and the two companies are currently developing a number of potential sites around the Republic of Ireland. Powergen Renewables is one of the United Kingdom's leading developers and owner operators of wind farms and Saorgus is an Irish company specialised in the development of large wind energy sites in Ireland and overseas.

Tursillagh supplies 50 GWh of electricity per year to the ESB network. This electricity is sold by ESB to be used throughout Kerry in homes, streets and industries. This amount of power is equivalent to fully supply half of Kerry's homes for as long as the wind blows over Tursillagh. If you live in Kerry and it's windy outside, the chances are that the electricity powering your computer right now comes from the wind at Tursillagh. It is estimated that the annual electrical output of the wind farm is equivalent to that used in approximately 12 000 homes.

EXPERIENCE OF TRALEE

A power purchase contract under the Alternative Energy Requirement (AER3) for the wind farm was awarded in April 1998, planning permission was obtained in 1998 and the construction commenced at the end of 1999. Wind Prospect Ltd, on behalf of Tursillagh Wind Farms Ltd, managed the construction phase. The electrical works were designed and installed by the Irish Electricity Supply Board, ESB, International Ltd, who was also in charge of the installation of the connection to the distribution system. The turbine supplier was Vestas and the civil engineering company was Coillite, an Irish Forestry Organisation. The construction was completed in late August 2000, the first electricity generated was in September 2000 and the commissioning date was in December 2000.

The wind farm is situated on a gently sloping peat bog overlooking Tralee, at an altitude of 300 m above sea level. The site is leased under a long-term arrangement with the landowner, and traditional peat cutting continues between the turbines. The turbines themselves are arranged in 5 rows, and are connected by underground cables laid alongside new access tracks. These access roads have also improved access to the site for the peat cutters.



In Tursillagh Wind Farm there are 23 turbines installed, type Vestas V47, each rated at 660 kWe, giving a total installed capacity of 15 MWe. The turbine towers are made of tubular steel and are 50 m tall; Cambrian Engineering manufactured them. The blades are made of glass fibre reinforced epoxy and are each 23,5 m long, giving a rotor diameter of 47 m. When the wind speed is between 4 – 25 m/s, the turbine will generate electricity, while above this wind speed the blades are feathered in order to withstand the higher forces exerted by the wind.

Electricity is generated by the turbines at 690V, and is then stepped-up to 20kV by transformers located at the base of each turbine. All turbine transformers are connected to a single 20/38 kV grid transformer located within the electrical site and metering compound.

In Ireland, a substantial amount of electricity is generated from fossil fuels, including coal, peat and oil. So the Tursillagh Wind Farm project has positive effects on the global and local climate change because of the reduction of harmful emissions in the air from fossil fuel power plants; 50 GWh, which is the capacity of this wind farm, are equivalent to 40 000 tonnes of CO₂, 490 tonnes of SO_x, 164 tonnes of NO_x and 2 500 tonnes of ash and slag.

EVALUATION AND OUTLOOK

The wind farm is operated by Tursillagh Wind Farms Ltd, with Vestas being responsible for maintaining the turbines, and ESB International responsible for maintaining the electrical infrastructure. The site is not staffed, but continuously remotely monitored from Tralee in order to maximise the availability of the turbines and the power generated.

FURTHER INFORMATION

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