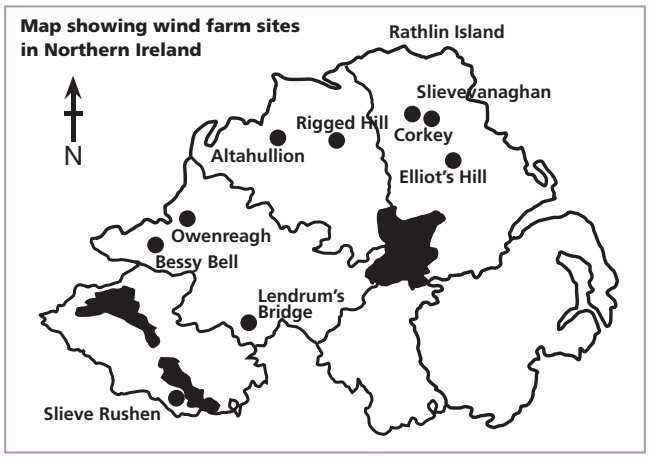
Wind Energy

What is wind energy?
How can we use wind energy?

Wind is the movement of air between areas of different pressure. Temperature differences cause differences in pressure. Wind is stronger when different areas of pressure are closer together. The strength of wind changes because of the change in the weather system, influencing our weather.

People have used wind for thousand of years, for example, to power sailing boats, mill grain and pump water. 'Wind Mills' that were used over 100 years ago can still be found in Northern Ireland. Why not have a look at: http://www.ehsni.gov.uk/places/monuments/ballycopeland.shtml.

Today, wind energy is one of the cheapest ways to produce electricity. Northern Ireland has one of the **greatest wind energy resources in Europe,** with exposed areas, like hilltops, being the best location for wind turbines. Northern Ireland has many wind farms (a collection of turbines), for example, near Newtownstewart, Strabane, Limavady, Enniskillen and Dungiven. There are also many individual wind turbines seen at houses, businesses and other places, like Antrim Hospital.

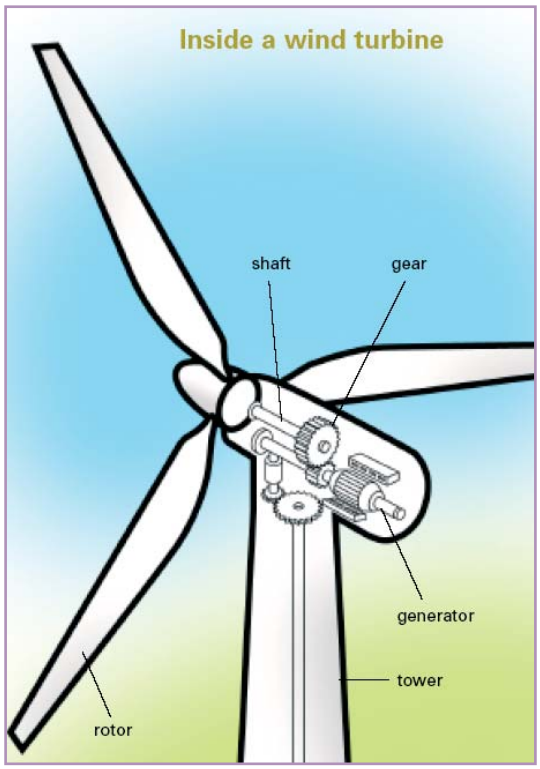


Elliot's Hill Wind Farm, Co. Antrim
Courtesy of Scottish Power

How does wind energy work?

The force of the wind turns the blades **(rotor)**. The blades are connected to a **generator**, which produces electricity. Wind speed increases as you go higher above the ground, so wind turbines are on a tower. Wind speed also increases if there are no hills or buildings to slow it down - exposed, hill-top locations are good. It is normally windier at sea than on land. A number of wind turbines in the sea are called **offshore wind farms**.

Offshore Wind Farm
Coutesy of Vestas



Source: dti

More about wind turbines...

- At a home, when a turbine produces **MORE** energy than needed, it can be sold to a local energy company e.g. NIE.
- When a turbine does not produce **ENOUGH** energy, electricity can be bought from, e.g. NIE
- The bigger the turbine the more electricity it will generate.
- The amount of energy produced varies due to location and local wind conditions.

Advantages

- No waste, CO2 emissions or other pollution produced
- Once a wind turbine is built, its running costs are very low
- The land around wind turbines can be used for farming
- Wind farms can become tourist attractions

Disadvantages

- No wind, no power
- Some people think that wind turbines spoil the look of an area
- Wind farms create a low-level noise
- They can interfere with television reception and radar

Wind Energy - Key Stage 3

Case Study 1

Where?
Heather Grove Farm Guest House, Meenacloybane, Garrison, Co. Fermanagh
What?
2.5kW wind turbine
Height?
15 metres
How much electricity?
Estimates 8,403kWh per year, enough to provide electricity for farm buildings and 10 bedroom guesthouse
CO2 savings? 5,109kg CO2/yr

Case Study 2

Where?
Church of the Nativity, Poleglass, BELFAST
What?
20kW wind turbine
Height?
30 metres
How much electricity?
Estimated to generate 30,000 to 40,000 kWh per year = £3,000 to £4,000 yearly savings on electricity bill
CO2 savings?
Between 18,249 – 24,320kg CO2/yr

Case Study 3

Where?
Elliot's Hill Wind Farm, Co. Antrim
What?
10 wind turbines
Height?
39 metres
How much electricity?
5.0MW = about 0.3% of peak winter energy demand in Northern Ireland

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