# Wind energy: the alternative power source that spread across uk by wind's speed

Environment, Ecology

# WIND ENERGY

Wind energy is one of the most quickly developing sources of energy in the UK. In Northern Ireland alone, there are now 12 sites with wind-powered generators in action. Power ratings can vary from a few kilowatts to several megawatts. A large wind-farm (10 -25 machines) can produce enough electricity for around 6000 homes, avearaged on a yearly basis. Advantages Wind generators produce no pollution while in use There are no fuel costs, so that running costs are very low, just occasional maintainance. Disadvantages Power levels may be very low if there are not strong winds. The level of output may vary from minute to minute, and from season to season. Wind generators themselves are expensive. There are potential problems with noise if the wind generator is near to populated area, and visual intrusion on the landscape if it is situated in a remote area. Wind Energy in Northern IrelandAs this picture shows, wind power has been used for centuries in Northern Ireland – This is the Ballycopeland corn mill, recently restored to working order. The picture below shows a modern 300kW wind turbine at Slievenahanaghan.

Case Study of a Wind Turbine on a Farm Location: Dotterel Cottage Farm, Weaverthorpe, North Yorkshire “ Electricity is in constant 24-hour demand on the farm, my bills have been halved. In 10 years or less the investment will be paid for, and then my electricity will be virtually free.” Anthony Milner, Proprietor, Dotterel Cottage Pig Farm. Concept The farm produces pigs and is a high electricity consumer; it is situated in a moderately windy location 110 m above sea level. As a means to reduce the costs of electricity a turbine

was purchased in 1992. The electricity generated is used directly by the farm for heating and ventilation in its breeding unit housing 230 sows. Any excess is sold to Yorkshire Electricity plc. The availability of cheaper electricity has encouraged diversification of the farm’s business: in 1994 new grain mills were purchased. The farm uses 60-70% of the full output of the turbine during electrically powered grain milling.

Technology The single Lagerwey turbine, rated at 80 kW, has a tower with a hub height of 30 metres and atwo-bladed rotor with a diameter of 18 m. Electricity production begins at a wind speed of 2. 5 m/s and the turbine reaches its rated output at 11 m/s. The turbine shuts down at wind speeds in excess of 30 m/s to prevent it sustaining damage. A single generator operates at variable speeds, generating electricity at 415V and feeding it directly into the farm and domestic mains system. When the turbine is generating in excess of the farm’s demand, electricity is sold to Yorkshire Electricity. Import and export meters, owned and installed by Yorkshire Electricity, record the transactions, which are summarised in monthly statements. The installation charge for these was £1 300, including connection to the electricity distribution system. The turbine has generated an average of 185 000kWhy-1 since 1992. Life expectancy of the wind turbine is 20-25 years. Benefits Supplies about 40% of the farm’s electricity, halving electricity bills from the pig unit and saving almost £9 000 p. a.

Encouragement of farm diversification: cheap electricity has boosted the economics of a new milling business. An average saving of 6. 2plkWh generated, with excess sold to Yorkshire Electricity at 2. 1plkWh. Even

though the farm does not solely use energy from the wind turbine and is still partially reliant on the grid system, the savings from the one turbine are self-evident. The £9 000 of energy costs saved is a big gain on a farm and has allowed diversification at a time when it is crucial. It is probably more of a benefit now than in 1992 in the present agricultural climate that is affecting pig farmers due to grossly deflated producer prices due to supermarkets.