WeatherWorks

Powered by Nature

By Tim Pullen

Can I install a wind turbine on my property?

Many people want to install a small wind turbine system to help power their homes, because they believe they have a windy site. But there are several factors that affect how well it will perform and whether it is a viable choice. The British Wind Energy Association (BWEA) provides useful information on where to start.

Do I need planning permission?

The answer will be yes, but the situation is slowly changing. Small, roof-mounted machines with the hub of the turbine less than 1.2 metres above the apex of the roof may not need planning consent - unless it is a listed building or in a conservation area. Turbines up to 1.5 KW generally meet this criterion but roof-mounted turbines are inherently less efficient that mast mounted machines. Mast mounted machines tend to be taller (which is why they are more efficient) and still need planning consent. However, you should always contact your local authority and speak to a planner before proceeding.

How much energy will I get from a wind turbine?

It depends entirely on the size of the turbine and the amount of wind you have. The efficiency of wind turbines is very site-specific. Wind farm developers spend a lot of time and money ensuring that the site they may be considering has sufficient wind to make the farm commercially viable. A domestic installation does not have the same commercial pressure but it is still necessary to check wind spend and if you have "clear air", i.e. wind that is not disturbed by surrounding trees or buildings.

Generally speaking an average wind speed of more than 5 metres per second (m/s) is necessary for a reasonably efficient turbine. The wind speed needs to be compared to the turbine manufacturer's power curve to establish the likely annual output.

As an example the Skystream wind turbine is rated at 1.8kW. With a wind speed of 5 m/s this machine will output around 10.5kWh per day or 3800kWh per year.

A very rough calculation, the capacity of the machine x hours in the year x 25%. In the case of the Skystream this is 1.8 x 8400 x 25% = 3780kWh

How much will it cost?

Again this depends on the turbine and the site. The Skystream used in the example above is about the smallest practical turbine for a domestic situation. It will cost in the order of £9,000, installed. The average 3 to 4 bedroom house will need a 2.5 KW turbine to meet all its electricity needs which will cost in the order of £12,000 to £15,000, installed.

How big is a wind turbine?

The diameter of the blades will vary with the turbine, but in a relatively small range. So that a 2.5 KW machine will generally have a blade diameter of around 4.5 metres and will need to be about 10m to 12m high. In some cases higher and generally the higher the better. The Skystream has blades of 3.7m usually on a 10m mast.

Are wind turbines noisy?

All wind turbines create some noise. Some wind turbines deal with it better than others. There are some that advertise themselves as being quiet or silent. The best advice is to visit one in-situ and see for yourself if the noise level is acceptable to you.

Any noise they make tends to be low frequency hum or "thrumming" sound. Bear in mind that a turbine needs to be sited away from houses to get good clean air so any noise is not usually too intrusive.

A factor sometimes overlooked is "flicker". The flickering effect of the blades passing across the sun. If the turbine is sited between you, in the garden say, and the setting sun, this can be a problem.

Can I sell surplus electricity?

The answer is yes and this is where the idea gets interesting. The Energy Act 2008, coming into effect in 2010, introduces "feed-in tariffs". A Government set rate at which to sell energy to the grid. This is likely to be far higher than current rates - possibly over 16p per kWh and are likely to make the whole idea of micro-generation more attractive.