

# Turning Wind into Electricity



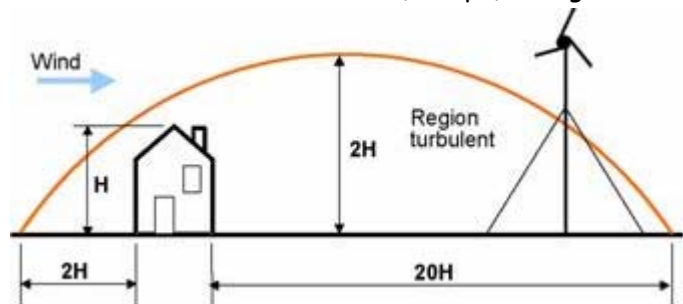
Horizontal-axis wind turbines (HAWT) typically have two or three blades. They can operate "downwind," with the blades facing away from the wind or upwind with a vane trailing behind. Horizontal axis turbines are the most common type used today and can be mounted on roof tops if the structure can support them.

Installation of a wind turbine will depend on whether you have sufficient wind at your location and how much space you will need. Ideally, the turbine should be sited as far away as possible from buildings or trees, which may cause turbulence. As a guide, the wind turbine should be about twice the height of obstructions in front of it. This test should be applied for all obstructions that are within a distance from the wind turbine of 20 times the height of each obstruction. See the diagram below.

Space is needed for anchorage points if you have a guyed tower and to lower the tower for maintenance. The turbine will create noise, so planning authorities will generally not let you site one too close to your neighbours. The actual distance will depend upon a number of factors, but as a guideline current regulations say a turbine should be at least 50m from the nearest neighbor.

Annual mean wind speed (AMWS) is an indication of how much wind energy is available in a typical year. In the UK, AMWS could be as low as 4 m/s (9.0 mph) for an inland site to around 8 m/s (13 mph) or higher on the most exposed sites.

An estimate of AMWS in meters per second (m/s) for each 1km square all over the British Isles at a height of 10m is available from a Government funded database, so we will be able to tell you the approximate AMWS for your postcode and an approximate energy output of the wind turbine at your site.



An assessment of the power requirements of your particular application will need to be made in order to determine what size of turbine will meet all your needs. A medium sized home requires approx. 4-5MWh/yr. The HAWT illustrated here stands 12m or 15m high and would be capable of supplying this level of energy at an AMWS of about 4 m/s and can supply up to 20MWh at 8 m/s.

If the AMWS at your site is less than 3.8 m/s a Solar Photovoltaic system may be a more economic choice for your situation and it is possible to combine both on a single installation.

Ideally the wind turbine should be connected to the national grid, so whenever you need more power than the wind turbine can produce, it will simply come from your electricity supplier as it does now, but should surplus energy be generated, at time of low or zero demand for example, it can be sold back to electricity grid.

Turbines are available in all sizes, a 6kW unit would cost in the region of £20,000 installed. Grants are available at £1000 / kW to a maximum of £5000 making it an attractive Microgeneration option for sites that can accommodate them.

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