

HOME WIND TURBINE DESIGN UNCOVERED

Back in the day if you thought about a home wind turbine, what would have come to mind is a large tower with enormous white blades spinning rather slowly. But, with the development in technology and the need for more and more people to become energy efficient, small residential wind turbines can now be erected at home. Even better news for green enthusiasts is the ability to make their home wind turbine, without spending thousands of dollars on contractors.

How a home wind turbine works

In a nutshell, a home wind turbine generates electricity by turning a motor. The motor is placed in the hub, on which three or five rotors are mounted, and then placed on top of a long tower. For the blades to spin effectively, they need to be facing the wind at all times, so either a tail (similar to a weather vane) or an electronic guidance system is used.

The generator is basically an electric motor. As the coils in the motor spin past the magnets, an electric current is produced. The power produced is stored in batteries, which are connected to an inverter to change the direct current to alternating current, which can then be used to power your home. The advancement of motor efficiency, is the reason wind turbines have become so popular for home use.

The tower's main purpose is to hold the blades high up in the sky, to catch those stronger winds. In windy areas, it can be slightly shorter, and in calmer regions, the tower will be taller.

With more money being put into research, the blades have changed drastically over the years. The rotors generally have 3 instead of 5 blades now, since the blades have become lighter, stronger, and able to spin in very light breezes. The blades also come in an assortment of diameters, according to the average wind speeds and energy needs.

What I have been describing so far is the average horizontal wind turbine. But you also

get a vertical axis wind turbine (VAWT), with large water-wheel type blades that spin on a vertical axis. The VAWT is not ideal for residential homeowners or small business since the blades spin close to the ground and are not capable of catching the stronger, high-altitude winds. Another concern is the amount of bird and bat fatalities caused by these large, blades that are difficult to see when spinning at full throttle.

Before going out and installing a wind turbine, it is best to ask yourself the following questions:

How big is the property?

Wind turbines generally operate better in large areas that cover an acre. This is because wind flow is not deflected by any nearby buildings.

How windy is it where you live?

Ideal wind conditions should be at least 11 mph, but otherwise a taller tower with larger blades will help to catch the high-altitude winds.

Other uses for the wind turbine:

If you could use the turbine for other purposes, such as pumping in water from outside, then it may be more useful than you think. This is the reason you see so many windmills scattered over farms - they help pump water from reservoirs to the farmhouse.

Does my house need a constant power supply?

This is why so many people want to get a small wind turbine in the first place - to keep the house powered during blackouts, and prevent economic losses. Although the wind turbine may not power the house all the time, it's stored power can be used in emergencies, when the utilities are just not enough.

Taking the above points into consideration will help you determine how much power you

require, the length of tower needed, the diameter of the blades, and the benefits and costs of using a home wind turbine.

The good news is that technology is forever evolving. The motors have become so light and efficient that they can be used in a number of smaller wind turbines attached right to your roof, instead of having to rely on one large wind turbine.

Although professional home wind turbines can run into several thousands of dollars, it is possible to make your own for a tenth of the price, with components found at home and your local hardware store. Furthermore, the U.S. offers both state and federal tax credits that you can use to offset the installation cost. So not only will you reduce your electricity bill, but also your tax at the same time.

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