



Wind turbine for small business

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A small wind energy system can provide you with a practical and economical source of electricity if:

Small wind energy systems may provide an economical source of electricity if you live in an area with fairly steady strong winds and at least one-half acre of open land.

Windmills from 2 Eras, photo courtesy of James Wade

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Personal impressions of the windiness of a site are often not accurate; it is better to use an objective method. The most useful information will be obtained from placing an anemometer (a device which measures wind speed) on your site for at least one year. Some states have anemometer loan programs. You can also find wind data from state wind resource maps and state anemometer loan programs. Winds on your site should be at least class 2 (annual wind speeds averaging 9.8 to 11.5 mph) to be suitable for wind generation. These should be average sustained wind speed, not strong gusts interspersed with calm. The U.S. Department of Energy has more information on siting turbines, and the American Wind Energy Association has a siting handbook.

You will have to make sure your local zoning codes or covenants allow wind turbines and the fairly tall towers that make them work. Wind turbines are growing and evolving rapidly, so you need to do enough research to learn whether a turbine will pay for itself quickly enough to meet your financial requirements.

Small wind systems designed for individuals, businesses, and farm or ranch operators are growing dramatically. The industry group American Wind Energy Association predicts a thirty-fold increase in the United States in the next five years.

Until recently, most of the small wind turbines were installed by people who lived "off-the-grid," that is, away from a power company that supplied them electricity. They relied on their own ability to make power with a wind turbine, perhaps solar panels, and backup batteries to store power.

Many states have now passed net-metering laws which allow consumers to sell back electricity to the utility company, making it more economical for even grid-tied consumers (people who already receive electricity from a utility) to offset their electricity bill by generating wind.

Most small wind turbines have a rating or size based on the maximum electricity they can generate such as 1.8 kilowatts or 5 kilowatts. But that is not a very useful number for most consumers. This is because rated output is the peak production at a specific (and usually high) wind speed, and different manufacturers use different wind speeds to determine rated output.

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It is better to use turbine power curves to estimate output. Any reputable small wind turbine representative will supply you a power curve, showing how much electricity the machine produces at a given wind speed. Use this to estimate how much energy (kWh) the turbine will produce each month or year at the average wind speed you expect or measure at your site. Match this output with your annual energy consumption. To determine this number, check your monthly bills to come up with the annual total of kilowatt hours of electricity you use.

Once you have determined your annual electricity use, you can decide how much electricity you want to offset with a turbine, based on budget and other considerations. For example, if you want to offset nearly all your electricity use and have determined you have annual usage of 10,000 kilowatt hours, select a turbine that will produce that much power over the course of year at your average wind speed. Generally speaking, it is not a good idea to get a bigger turbine than you need unless you have some type of agreement with your utility to buy the excess power at a premium.

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