

# SMALL WIND FACTSHEETS



## What is Small Wind?

---

For many people, the term "wind energy" conjures up an image of utility-scale wind farms, large arrays of industrial-sized 750-kW turbines with 150-foot rotors mounted on 200-foot tall towers. But wind energy systems come in small packages as well. A typical residential wind energy system includes a 10kW turbine, with rotors measuring perhaps 23 feet in diameter, mounted on an 80-foot tower. Such a system is suitable for meeting the electricity needs of a household or small business. Turbines as small as 400 watts, with rotors only 46 inches in diameter, may be employed for specific purposes, such as pumping water (for stock or irrigation) or running lights and appliances in a remote cabin or recreational vehicle. Wind energy may be used to complement a solar photovoltaic (PV) system, or by itself. It may be set up as a stand-alone system, or it may be interconnected with the utility grid.

## Why Install a Small Wind System?

For over a hundred years, people have captured the wind's energy using mechanical windmills. Before rural electrification programs were instituted by the Federal government, farm families throughout the Midwestern U.S. used 200-3,000 watt wind generators to power lights, radios, and kitchen appliances. Today, small wind energy systems are still used to bring power to remote locations, but they are also

increasingly being used as an independent, clean, affordable alternative to fossil- or nuclear-fueled, utility-generated electricity.

## How Does a Small Wind Turbine Work?

Wind energy is a form of solar energy created by the uneven heating of the Earth's surface by the sun. Most small wind turbines use a horizontal axis propeller, or rotor, to capture the kinetic energy of the wind and convert it into rotary motion to drive a generator, which usually is designed specifically for the wind turbine. The rotor consists of two or three blades, usually made from wood or fiberglass. (These materials give the turbine the needed strength and flexibility, and have the added advantage of not interfering with television signals.) The structural backbone of the wind turbine is called the mainframe, and it includes the "slip-rings" that connect the wind turbine - which rotates as it points itself into changing wind directions - and the fixed tower wiring. The tail aligns the rotor into the wind.

To avoid turbulence and capture greater wind energy, turbines are mounted on towers. As a rule of thumb, turbines should be mounted at least 30 feet above any structures or natural features within 300 feet of the installation. Smaller turbines can go on shorter towers. For example, a 250-watt turbine may be mounted on a 30-50 foot tower, while a 10 kW turbine will



For more information, contact AWEA at [windmail@awea.org](mailto:windmail@awea.org) or call 202-383-2500. Visit our web site at [www.awea.org](http://www.awea.org), or write us at 122 C Street, NW, Washington, DC 20001.

# SMALL WIND FACTSHEETS



## continued...

---

usually need a tower of 80-120 feet. Towers come in a variety of designs, including tubular or latticed, guyed or self-supporting. Wind turbine manufacturers also offer towers, and can ensure that the tower meets required building and safety specifications as well as being compatible with the turbine.

### References

Adapted from a *Small Wind Energy Primer* by Michael Bergey, Bergey Windpower Co., previously published in *Home Power* and *Backwoods* magazines

### Other Fact Sheets Available on Small Wind Energy:

How Much Noise do Small Wind Systems Make?

What About Visual Impact?

Small Wind Systems and Public Safety

How Do Small Wind Systems

Affect Property Values?



For more information, contact AWEA at [windmail@awea.org](mailto:windmail@awea.org) or call 202-383-2500.  
Visit our web site at [www.awea.org](http://www.awea.org), or write us at 122 C Street, NW, Washington, DC 20001.