

# Small Wind Energy Turbines

## What are Small Wind Turbines



Small wind turbines are electric generators that utilize wind energy to produce clean, emissions-free power for individual homes, farms, and small businesses. With this simple and increasingly popular technology, individuals can generate their own power and cut their energy bills while helping to protect the environment. The U.S. leads the world in the production of small wind turbines, which are defined as having rated capacities of 100 kilowatts and less, and the market is expected to continue strong growth through the next decade.

That's why it's important to take advantage of rebates or tax credits available for small wind system installations. Well-sited small wind turbines can usually pay for themselves within 15 years, about half their serviceable lifetimes, if the right incentives are applied.

## Sizing Up Your Situation

Small wind systems pay off most consistently for rural homes and businesses with at least an acre of property, Class 2 winds, and utility bills averaging at least \$150 monthly. Under these circumstances, a 10-kilowatt wind turbine mounted on an 80-foot tower should generate an average of 1,000 kilowatt-hours (kWh) monthly. With a net metering arrangement, each kWh generated can be valued at the retail electric rate charged by the utility, since that's power you don't have to buy and may even be feeding back into utility lines. But the situation may look better when you factor in state incentives.

## The Numbers on Smaller Systems

Smaller wind generators with a 1-3 kW capacity don't usually produce excess generation and are often used to power specific applications such as water pumps or recreational vehicle lights and appliances.

A 3-kW turbine mounted on a 60 to 80-foot tower costs about \$15,000, including accessory components and batteries (if needed). A homeowner spending \$60-100 per month for electricity could knock 30-60% off their bill, depending on the wind speed, tower height, and price of electricity.

Systems smaller than 1-kW are often used in stand-alone applications, or as part of a hybrid system with solar PV cells. A 400-watt system can be installed for \$1,500.

## Resources

U.S. Department of Energy  
<http://www.eere.energy.gov/greenpower/markets/netmetering.shtml>

The Database of State Incentives for Renewable Energy (DSIRE)  
<http://www.dsireusa.org/index.cfm>

American Wind Energy Association  
<http://www.awea.org/smallwind>  
The Economics of Small Wind  
[Download](#) the PDF  
[See all](#) small-wind factsheets

PA Department of Environmental Protection  
[http://www.depweb.state.pa.us/energy/lib/energy/resenassist/small\\_wind\\_pa.pdf](http://www.depweb.state.pa.us/energy/lib/energy/resenassist/small_wind_pa.pdf)



Small wind turbine tower, Tom Ridge Environmental Center at Presque Isle

[www.dcnr.state.pa.us](http://www.dcnr.state.pa.us)



**pennsylvania**  
DEPARTMENT OF CONSERVATION  
AND NATURAL RESOURCES