

Powered by the wind

Generate electricity for your farm with a small wind system **By Lynn Grooms**

IF YOU have ever thought about installing a small wind turbine on your farm to generate some of your own electricity, you are not alone. Last year, approximately 7,000 Americans (homeowners, farm operators and others) bought small wind systems. And since 1990, the small wind industry has reported an annual growth of 14 to 25%, according to the American Wind Energy Association (www.awea.org).

Of the wind systems distributed in 2006, about 19% went to farms, according to AWEA, which defines "small wind" as wind-powered electric generators with rated capacities of 100 kW or less. A small wind system may include a turbine, tower, inverter, wiring, battery and foundation.

Many farmers are interested in utility-scale projects installed on their land. Although these projects are typically developed, installed and owned by a wind power developer or energy company (and sometimes by a group of farmer investors), farmers can earn royalties or a combination of flat fee and royalties of \$2,000 to \$4,000 or more per year per megawatt installed. In these cases, farmers do not use the electricity. Rather they sell it to the area utility or wholesale power market, says Christine Real de Azua, assistant director of communications, AWEA.

What's needed

Buying and installing a small wind system is not necessarily a breeze. It pays to do your homework about local wind patterns, economics, necessary permits, insurance and the equipment itself. Fortunately, there are several sources of information available to help.

A list of frequently asked questions about the economics of small wind systems, for example, is available at www.awea.org/faq/rsdntqa.html.

The National Renewable Energy Laboratory also has produced the "Small Wind Electric Systems: A U.S. Consumer's Guide." You can find the guide at www.eere.energy.gov/windandhydro/windpoweringamerica/small_wind.asp.

At least one acre of open land and an adequate wind resource (preferably Class 2 or better) are necessary for an attractive financial return on a small wind installation, notes the AWEA. To learn more about wind resources in your area, visit www.eere.energy.gov/windandhydro/windpoweringamerica/wind_maps.asp.

Incentives also may be available for your area. Steve Turek, general manager, Wind Turbine Industries, Corp., Prior Lake, MN, recommends visiting www.dsireusa.org for a database of state, local, utility and federal incentives.

Costs

A small turbine can cost several hundred dollars for smaller, battery-charging applications, to \$15,000 to \$60,000 for systems to power a home, depending upon size, application and service agreements with the manufacturer.

Costs for small wind systems have come down somewhat. The AWEA reports that the retail cost per kilowatt-hour (kWh) of electricity produced by small wind systems has fallen from \$0.15 to \$0.18/kWh to \$0.10 to \$0.11/kWh.

A 2005 market survey also found that the industry aims to reduce hardware costs 20% by 2010 to \$1,700 per installed kilowatt of capacity.



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Manufacturers are designing small wind systems to be increasingly easy to install, operate and maintain. In addition, some turbine models transmit live data remotely so that a customer can monitor the system's performance and maintenance needs from a home computer. A list of small wind equipment manufacturers is available at www.awea.org/smallwind/smsyslst.html.

Payback periods for small wind systems range from six to 30 years, depending on factors such as wind resource quality, siting, permitting costs, prevailing energy costs and turbine performance, reports AWEA. A 2006 study by the Lawrence Berkeley National Laboratory estimates that a 30% federal investment tax credit with no cost cap could reduce the payback period of a system by an average of four and a half years, and a state property tax exemption could similarly reduce this period by four years.

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Photo: Bob Bechtold