NRECA CRN™ COOPERATIVE RESEARCH NETWORK

Get the Facts Before Buying Into Wind Power

BY BOB GIBSON

More and more people are attracted to the idea of generating their own electric power through the use of "backyard" renewable energy systems. Small wind turbines are one of the most popular choices, but careful study and assistance from your co-op can make sure you know the facts before buying one of these systems.

The spinning fan of a windmill pumping water from a well was once a common sight across rural America. When electric co-ops began lighting up the countryside in the late 1930s, farmers and rural residents began replacing the mechanical energy of the windmill with electricity from power lines.

The wind turbines seen today are distant cousins to those windmills. The essential difference is that today's wind systems—generally a three-blade rotor connected to a generator and tail and mounted on a tower—converts wind energy into electricity, rather than simply turning gears to lift water. The most popular residential-scale wind turbines can generate between around 2 kilowatts of power—about one-third to one-half of what a typical home needs—to 10 kilowatts. In recent years, small wind turbines have become more reliable and, to a degree, prices have come down as more are built. More dealers are offering a better choice of products and more experienced installers are available to erect the units.

So is installing a wind turbine at your home a good idea? That depends on two basic factors: your motivation and your location.

If your motivation is to save money—(to spend less on electricity than you do today)—or to make money—expecting the small wind turbine will earn you a profit by selling power back your local electric co-op—proceed with care. Even though federal tax credits and utility incentives and rebates have helped lower the cost for some, in most parts of the country it remains difficult to generate

electricity at a price equal to or lower than what you'll obtain from your electric co-op. While wind that blows through your property may be free, the equipment needed to capture that wind is not, and wind doesn't blow all the time.

Electric utilities are required by law to buy your excess power. But in many areas they are only required to pay the same price they pay any other power generator—what in utility jargon is called "avoided cost." But even where your bill might be credited for wind power at retail rates, called net metering, the sale of those kilowatts won't make you rich. Paying back the cost of installing a wind turbine, which runs from several thousand dollars to $50,000, can take several years to several decades.

You also need to consider your location. In more densely settled areas, local zoning laws may prohibit the construction of a wind turbine. But in any location, you must know just how much wind you have, day after day. In these calculations, average wind speed becomes critical.

While the federal government has mapped out average wind speeds across the country (www.nrel.gov/wind), each specific site is unique, affected by factors such as elevation and obstruction from buildings and trees. Better wind speeds are found higher off the ground, and there can be a huge difference between wind speeds at the 300-foot heights that large-scale wind turbines have and the 80- to 100-feet height of a small wind turbine.

Before getting too far down the road at installing a small wind turbine, do your homework. That includes checking with your local electric co-op well in advance of making a purchase. Being aware of your co-op's policies and procedures associated with interconnecting a wind system to the grid will avoid headaches, disappointments, and unexpected costs.

The grid is a complex, interrelated machine and some costs may need to be incurred for studies or upgrades to preserve safety, reliability, or quality of power. Your co-op may be able to help you estimate what those costs might be in advance and help you find additional opportunities for energy efficiency that could further reduce your electric bills.

To find out what incentives may be available in your state, go to the Database of State Incentives for Renewables and Efficiency at www.dsireusa.org. ■

INTERESTED IN BUYING A WIND TURBINE?

Make sure to ask these questions first.

1. **How reliable is the rated energy output? How did you calculate the output? What wind speeds did you use?** Experts advise ignoring peak output and power curves provided by vendors. Rather, look for the monthly or annual energy output—in kilowatt-hours—for the turbine, estimated for the average wind speed that you expect or have measured at your site.
2. **Is the inverter UL listed?** If the inverter (required to convert direct current power from the turbine to alternating current power of the grid) is not Underwriters Laboratories, Inc. (UL), listed, find another vendor. Most electric co-ops require that an inverter carry a UL 1741 certification for interconnection with the grid.
3. **What is the estimated total installed cost? What does the turbine cost? What does the tower cost? How much is installation estimated to cost? How much will interconnection cost? How much maintenance will be required and what will it cost?** Budget for labor expenses as well as the cost of equipment rental, concrete and rebar, electrical components, shipping, and sales tax. It adds up fast.

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INTERESTED IN BUYING A WIND TURBINE? CONTINUED

4. **How long is the warranty? What does it cover—parts? Labor? Can it be extended? If so, what will it cost?** Warranties range from one to five years. The longer the warranty, the better. Make sure the warranty covers labor as well as parts. Ask owners of wind systems purchased from the same vendor about performance and reliability before making a decision on an extended warranty, if available.

   If you live in an area prone to lightning strikes, you should strongly consider the option of lightning protection.

5. **How long has the vendor been in business? How many turbines have they sold? Have their turbines been certified? Can they perform maintenance, or is there another licensed repair technician in the area?** Look for vendors that have been in business for at least five years or have acquired the product line of another vendor. In addition, ask the vendor for the names of at least two people who have installed a similar model wind turbine. Check with the references to ensure they are happy. Ask them if there was anything they wish they had known before investing in a turbine.

   The Small Wind Certification Council has been conducting a small wind certification process in the U.S. (www.smallwindcertification.org). Small wind turbines can be certified using the International Electrotechnical Commission (IEC) standard, IEC 61400-2, for testing wind turbine power performance. This standard is increasingly used by U.S. manufacturers.

6. **What are your electric co-op's interconnection policies? What will the co-op pay for any excess energy you may produce?** Electric cooperatives must provide all of their members with safe, reliable, affordable electric service. Most co-ops have interconnection policies designed to permit interested members to own their own generation without impacting the quality or cost of service received by other members. Knowing what those policies are before purchasing a wind turbine will help you better evaluate the full costs and benefits of the investment.

7. **What local zoning laws, electrical codes, homeowners' association requirements or other local laws and standards apply to wind turbines?** Some local zoning ordinances and homeowners' association policies restrict the height of wind turbines or require that they be set back a specified distance from the property line. Those restrictions may prevent you from taking advantage of the best wind resources or may require extra time to pursue a waiver or exception. Local electrical or building codes may also impose additional time or expense.

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