



E3A: Small Wind Energy Applications for the Home, Farm, or Ranch

Steps in the Small Wind Series

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2. Electricity Consumption and Installation Options
3. Assessing Your Wind Resource
4. Estimating Energy Production
5. Selecting Turbine Model and Tower Height
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Small Wind Energy Checklist

Exploring Energy Efficiency and Alternatives

This series explores the applications and benefits of small wind. It is designed to help you understand both the benefits and limitations of small wind before you buy a system. You will be a happier small wind system owner if you know what to expect before you install your own turbine!



*Courtesy of DOE/NREL:
Credit Doug Nelson*

Is Small Wind Energy Right for Me?

The following ten questions may help you decide if small wind will work for you.

1. **Are you willing to learn about small wind?** Great strides are being made, but small wind is still a buyer-beware market. Be prepared to educate yourself about wind systems or hire a qualified installer/consultant to guide you through the buying and installation process.
 - Yes
 - No
 - Uncertain
2. **Have you considered your energy consumption and the price of electricity?** Energy conservation and efficiency is the best place to start! Being aware of your current electricity usage and cost is valuable for effective decision-making. Renewable energy systems are more cost effective in markets where electricity prices are high and in situations where conservation and efficiency measures have been implemented.
 - Yes
 - No
 - Uncertain
3. **Do you have a good wind resource?** Many factors determine the quality of a wind resource, and wind speed is a key consideration. In general, wind speeds that average below six to seven miles per hour are unable to produce significant amounts of electricity generation. Consider a small wind system if the average wind speed at your site is over 10-12 miles per hour. Information on how to assess your wind speed will be covered later in the series.
 - Yes
 - No
 - Uncertain
4. **Are you comfortable with some level of uncertainty in power production?** Wind speed will fluctuate. System size, type and the site characteristics will cause differences in energy output. Many people do not mind the variability, but if you want consistent generation, a wind system may not be right for you.
 - Yes
 - No
 - Uncertain
5. **Are you willing to invest in a tall tower?** Wind speed increases with height above the ground. A tall tower will enable your wind turbine to produce more electricity. Towers can cost more than the turbine—and the taller the tower the greater the cost. Appropriate tower height will vary by location, cost, and the turbine selected. Tower heights typically range from 45 to 120 feet. There are a few locations where tower heights of 30 feet may be viable but they are the exception, rather than the rule.
 - Yes
 - No
 - Uncertain

6. **Can you finance a small wind system?** A system that would offset most of an average grid-connected home's electricity use (10,000 kWh/year) will cost roughly \$50,000 before incentives.* Some homeowners opt to reduce the total investment in the wind system by only off-setting a portion of their total energy use. This reduces the system cost, but does extend the payback period for the turbine. Some installers or manufacturers offer financing. Incentives may offset 45 percent or more of your total system cost. Many incentives are tax credits or reimbursements received after installation, thus initially you may have to finance the full cost of the system.
- *Please note that off-grid wind systems are typically smaller and therefore less expensive than grid-connected systems. However, other system components such as batteries will add to the overall cost of an off-grid project.*
7. **Do you have enough available space?** You should have at least one acre of available land around the site where you would like to place your turbine. Zoning or ordinances may require one-half acre to over five acres of available space based on the size of wind system.
8. **Does your area allow wind turbines?** Some areas do not allow wind turbines or have special permitting for small wind turbines. Restrictions may limit the height of structures. Other zoning restrictions may address noise, tower placement, and tower type. Check with your electrical utility to see if wind generators are allowed and what utility company rules you must follow if you intend to remain connected to your electrical utility.
9. **Are you willing to maintain the system?** Small wind turbines require at least annual maintenance. Maintenance requirements are different for each system. However, you will need to climb the tower, use a bucket truck, or take the system down (if you have a tilt-up tower) every year to inspect and repair components of the turbine. Do not consider wind if you are not willing to maintain your system or hire someone to perform maintenance work on a regular basis.
10. **Have you considered living with wind?** Visit an installed wind turbine so that you can listen to the noise and witness the visual impact that a turbine and tower may have on your property. You may also want to talk to your neighbors to discuss any concerns or objections they may have to your proposed system.

- Yes
 No
 Uncertain
- Yes
 No
 Uncertain
- Yes
 No
 Uncertain
- Yes
 No
 Uncertain
- Yes
 No
 Uncertain

Consider Your Answers

- If you answered “yes” to most of these questions, you may be a good candidate for small wind!
- If you answered “no” to most of these questions:
 - If you answered “no” to Questions 3, 6, or 7, you are probably not a good candidate for small wind.
 - If you answered “no” to Questions 1, 2, 4, 5, 8, 9 or 10, you may wish to do more homework and research before you pursue buying a system. Use the Guides to help you through this process.
 - If you answered “uncertain” to most of these questions, you need to do more research before you can decide if wind is right for you. You can use the Guides to help you through this process.

Notes
