**Siting and Permitting**

The purpose of a small wind system is to produce energy. Siting a wind turbine is a process of locating the system so that the turbine can have unobstructed access to the highest possible wind speed to take advantage of the function in the power equation.

The basic rule of thumb is to site the turbine with the bottom edge of the rotor blades at least 30 feet above the tallest obstacle within 500 feet. Some experts recommend that the bottom edge of the blade should pass three times above the tallest upwind barrier. Keep in mind some barriers change—especially trees, which grow over time. The topography of the site will also interfere with the wind resource.

The challenge for many potential small wind owners is applying basic rules of thumb to a specific site. Here are a few general guidelines:

- **Tower height** — The most common error in turbine siting is placing the wind turbine on a tower that is too short. Many times the decision to buy a short tower was made because the local installer did not offer the required tower height. Tower height should be determined by the terrain and the wind resource.

- **Optimize the wind resource** — Site upwind of obstacles to avoid ground clutter. You may wish to start examining the highest point on the property to take advantage of wind shear and reduced turbulence. Topography or other factors may not make the highest point the best location for siting, but it is often the point with the best access to the wind.

- **Soil testing** — Learn about the soil at your site. Soils vary in their capacity to support weight. Weak soils (soil strength of less than 1,000 pounds per square foot) may not be well suited for supporting a wind turbine, or may require additional engineering to ensure safe operation of the turbine. Got rocks? Rocks in your planned site may increase the total cost of preparing the site. The more you understand about your specific location, the better you will be able to forecast problems and develop an accurate budget.

- **Communicate with neighbors early in the process** — Early notification of your neighbors is a courtesy that can help to identify and prevent problems. Your neighbor’s concerns may impact your purchasing or siting decisions.

- **Noise** — Sound may carry differently according to topography and structures. Some small wind turbine owners report almost no sound from their turbines, but their neighbors may experience more sound. Some permits or zoning ordinances limit the noise levels as measured from the closest neighboring inhabited dwelling. Sound carries differently if the turbine is sited near metal buildings or bodies of water. The amount and type of noise varies by wind turbine and by site. If concerned, visit an installed turbine similar to the one you are considering to experience first-hand the sound of the turbine.

- **Visual impact** — Neighbors in very rural areas may have few concerns regarding visual impact. However, neighbors in more densely populated areas might have concerns or questions about the visual impacts of the turbine.

- **Property values** — There are studies on large commercial wind farms and property values. There are no comprehensive studies documenting small wind turbine impacts on property value. Industry proponents indicate that there are no known instances of small wind turbine installation negatively affecting property values. In some markets, small wind systems may increase property values.

- **Telecommunications interference** — Turbines are not known to interfere with telecommunications signals. The rotor diameter is small and the blade components (fiberglass or other composites) do not affect signals. There were reports of experimental turbine tests conducted decades ago where metal blades interfered with television signals, but there is no consistent evidence of interference using current technologies.
• **Safety** — In some areas, the permitting process requires significant documentation and precautions with regard to safety. In rural areas, safety standards may be lax or nonexistent. With regard to safety issues, you may wish to learn:
  * If there are county or city zoning or permitting requirements regarding safety.
  * If your insurance company has certain standards with which your turbine will need to comply in order to qualify for coverage.
  * Consider whether fencing and signage around the turbine would be appropriate for your site.
  * If your utility has specific guidelines with which you will need to comply in order to grid-connect your system.

• **Neighboring Turbines** — Locate the turbine at least ten rotor diameters away from the nearest turbine.

• **Avian impact** — Small wind turbine advocates suggest that the amount of avian impact from small wind is no greater than other objects into which birds might fly. However, there are no comprehensive studies regarding avian impacts from small wind. Use common sense. If your site is in a flyway, you might have impact. Contact your local wildlife management agency and discuss with them the migratory behaviors and flight heights of species in your area if you are concerned about impacts.

• **Lighting** — Unless lighting is required by your ordinances, it is unlikely that you will have to illuminate your turbine. The Federal Aviation Administration (FAA) does not require lighting on structures under 200 feet, unless they are adjacent to an airport.

• **Air traffic** — You will probably not have air traffic requirements, unless you are near an airport or military post. However, if you are in an area where crop dusting is common, check local air traffic safety standards and notify crop dusters in the area of your turbine installation. Check Department of Defense standards if your turbine site is near a missile silo.

### Permitting

Permitting requirements vary. Contact your city or county permitting agency to check the requirements in your area. Here are some common issues you may find in your local ordinances:

• **Documents** — Some permits will require signed plans from an engineer. If this is not required, check with your manufacturer to verify that your warranty will be valid if you do not have an engineered site plan—especially if you plan to install the turbine yourself.

• **Parcel Size** — Your permit may require you to have a minimum parcel size. Minimums tend to be one acre, if they are specified.

• **Allowable Tower Height** — Restrictions on heights of structures are common in zoning. Check to ensure that there are no maximum structure height ordinances that would affect your project.

• **Setback** — Setbacks refer to the distance you must site your turbine away from public areas or property lines. Setbacks usually refer to all parts of the system, which include guy-wires for guyed towers.

• **Noise Levels** — The noise levels are typically measured in decibels and may need to be measured from the closest neighboring inhabited dwelling.

• **Equipment** — Some permits restrict the types of equipment. Be sure you are aware of any such restrictions prior to purchasing a system.

• **Building Code Compliance** — Permits may require your structure to be compliant with any local building codes. This may require you to have signed drawings and a site plan analysis completed by a certified engineer.

• **Electrical Code Compliance** — You may be asked to supply drawings of the system’s electrical components and demonstrate that you are compliant with electrical code standards. If electrical code compliance is not required for a permit, it may be required by your utility for grid-connected systems.

• **Compliance with FAA Regulations** — If your site is near an airport or military facility, you may have FAA regulations with which you must comply. Your local planning department should be able to help you determine whether FAA regulations need to be addressed.

• **Utility Notification** — Some permits will require you to produce documentation that the utility is aware of your plans to install a small wind turbine. If this requirement is in place, off-grid systems may be exempt.

As you research the permitting process in your area, be aware that fees may apply. If permits are not required in your area, you may wish to find permitting guidelines from other areas or find best practices recommended from your manufacturer to ensure your turbine is installed properly.

### References


