



# Siting a Wind Turbine on Your Property



Putting Two Good  
Things Together:  
*Small Wind Technology &  
Vermont's Scenic Landscape*

## Small Wind Turbines

Small wind turbines, are designed for individual residential or business use. These turbines are usually under 15kW\* and have two or three blades spanning a diameter of about 20-24 feet. They are often mounted on a guyed monopole, or a free-standing lattice tower ranging in height from about 80 to 120 feet. Modern turbines are relatively quiet. These turbines offer benefits to individual property owners and to society as a whole.

### The Benefits of Small Wind Power

- ▶ Power generated without pollutants
- ▶ Diversifies our energy supply
- ▶ Power is delivered directly without a middleman
- ▶ Excess power can enter the power grid, reducing Vermont's overall energy needs (net-metering\*).

*\* Systems of 15kW or less are eligible for net-metered electric rates. Each year, up to ten 150kW systems can also be eligible.*



## Wind Power & Vermont's Scenery

Vermont's scenic landscape is recognized around the world and is highly valued by its citizens. At the same time wind energy is becoming an increasingly valuable natural resource for Vermont. Wind Turbines that get a Certificate of Public Good from the Public Service Board can be "net-metered" when linked to the statewide power grid. By law the Board must ensure that these structures will not

create "undue adverse impacts on the scenic and natural beauty of the area". This brochure is designed to help individuals and businesses construct wind projects that also protect Vermont's scenic resources.

*Net-metered turbines do not require a local permit, but the PSB will consider local standards in its review.*



## Land Uses & Wind Turbines

**W**ind turbines should be located in areas where there are relatively constant strong winds for maximum benefit\*. Turbines with blades in motion are more visually appealing than those that are still. Higher elevation lands have the best wind resources in Vermont. These areas are likely to be rural agricultural or forested areas. Rural and working landscapes, and industrial or commercial land uses will best absorb these mechanical structures. Their height and visual prominence make them more difficult to site on individual properties in denser residential areas.

*\* Information about wind availability on sites around Vermont is available through the American Wind Energy Association (AWEA) at [www.awea.org](http://www.awea.org).*



## Wind Turbine Design

Select a clean simple turbine design without obvious logos or symbols. Keep bright colors to a minimum. Flat gray is the most unobtrusive color. Many consider the guyed monopole designs to be more appealing than free-standing lattice towers in residential areas.

Turbines need to be 40 to 60 feet above nearby trees or other obstructions for optimum efficiency. Higher than that may be considered unnecessary. Most modern turbines are relatively quiet; but confirm that yours has a low noise rating.

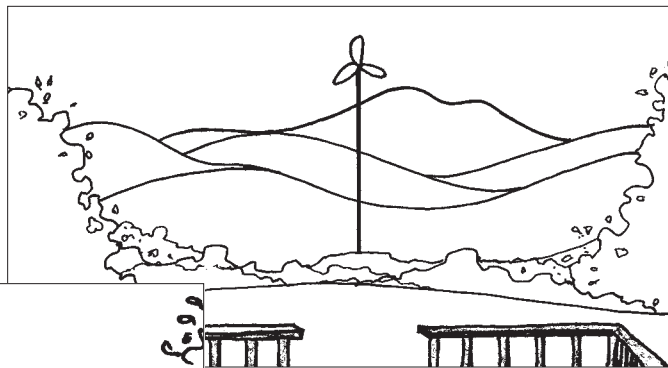
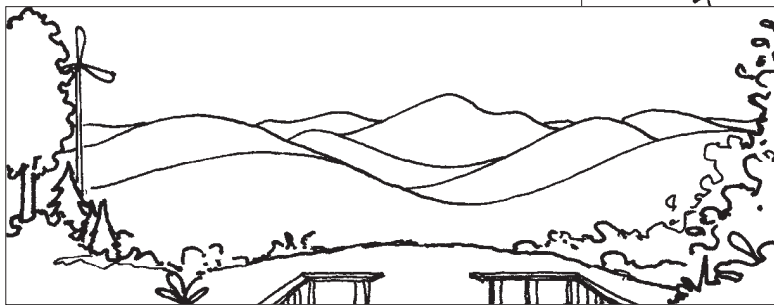
*If you think there are potential visual concerns with your turbine, there are several ways to get an idea of how it might look from various vantage points. If the terrain is suitable, the best method is to hire a crane which can extend to the height of your turbine. Helium weather balloons can also work but are difficult in windy sites.*



## Maximize Power & Beauty

Unlike most development in Vermont, wind turbines rise well above the trees. Most people find them to be acceptable and even desirable elements in the landscape, provided they are well designed and sited.

The techniques described on the following pages will help you site your turbine to reduce visual impacts from your neighbors' and public viewing areas. A turbine which is quite visible is not a problem, provided it does not appear as a focal point in important scenic views.



*A turbine seen at the edge of a scenic view is preferable to one seen in the center of the view.*

## Scoring Your Turbine

You can also use the **scoring system** on the next several pages to see if your turbine might result in “undue adverse” impacts as reviewed by the Vermont Public Service Board. The scoring system looks at two different kinds of vantage points:

- 1) Private Property (your neighbors’ views) and
- 2) Public Views (roads, recreation and natural areas).

Each viewpoint should be scored *separately*. To score your neighbor’s views, answer questions 1-4. To score public views answer questions 1-6. Each question can be scored from 0 (no impact) to 3 (greatest impact).

There are 12 possible points for each residential view, and 18 possible points from each view from a public area. See the **Impact Scale** that follows. If neighbors are unconcerned, you may consider the residential impacts to be minimal.

*This turbine is seen against a hillside, and at a distance of over 2,000 feet, so it is visually unobtrusive.*



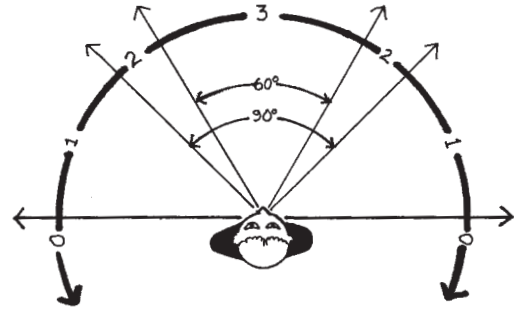
*Trees in the foreground can be used to screen your turbine from view. It may also appear to be relatively smaller if trees near the viewer look larger than the turbine.*

# Site to Protect Your Neighbors' Views

Use the illustration to the right to determine a score.

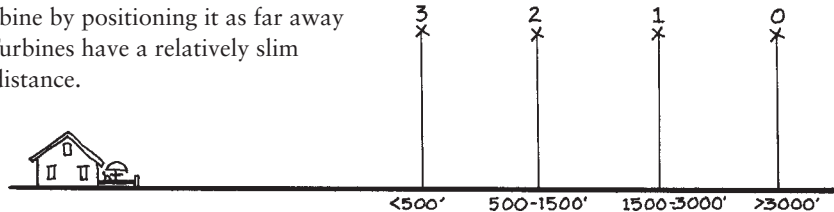
## 1. What is the Position of the Turbine in the View?

While it is reasonable for a turbine to be visible, it should not be a prominent focal point as seen in scenic views from your neighbor's primary use areas (for example, living room or kitchen windows, deck, sun porch), or from important public viewing areas. A turbine positioned at the edge of views usually has a lower impact than one which is at or near the center of scenic views.



## 2. How Far Away is the Turbine Seen?

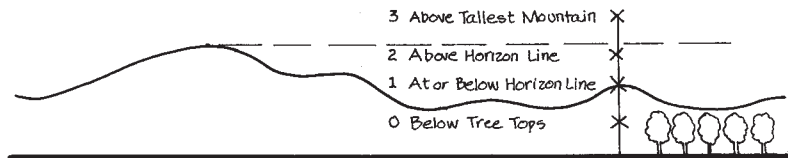
Reduce the apparent scale or size of the turbine by positioning it as far away from important viewpoints as possible. Wind Turbines have a relatively slim profile so visual impacts diminish rapidly with distance.





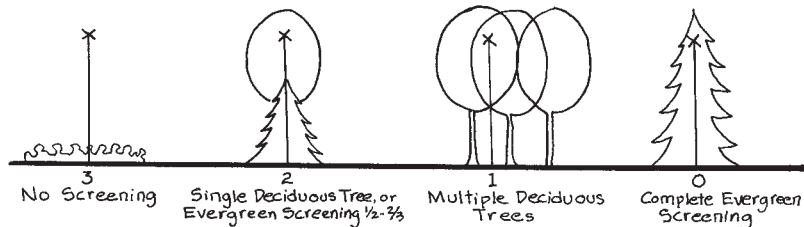
### 3. How Prominent is the Turbine?

When other objects like hills, trees or distant mountains appear to be higher than the turbine, its **apparent** scale is reduced.



### 4. Can the Turbine be Screened From View?

Use existing or new trees to help reduce the visibility of the turbine. Often a tree planted near a concerned neighbors' property line can dramatically reduce the visibility of the turbine without interfering with its efficiency. Tree planting should not block important distant views.



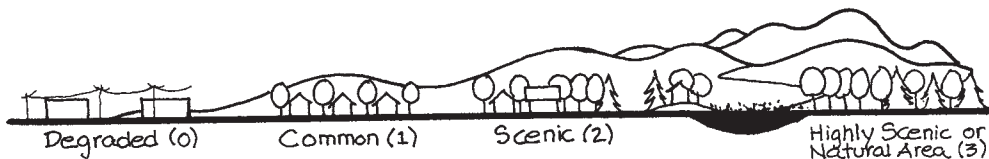
Add up your residential viewpoints score here. If it's less than 10 points, it is unlikely to interfere with your neighbors' views. To score public views, add the above score to scores for the following two questions.

## Site to Protect Public Views

Public areas that may be sensitive to aesthetic impacts include locally or state designated scenic roadways, public beaches, designated natural areas, and designated scenic trails like the Long Trail or Appalachian Trails. The same techniques used above can help protect views from important public viewing areas. To score public impacts, *use the four criteria above, plus the following two variables*. If your turbine scores less than 14 points, it is less likely to interfere with important public views.

### 5. Is the Turbine Seen From an Important Scenic or Natural Area?

Turbines seen in a highly scenic context may appear more intrusive, particularly if they are prominent in a view of an important natural or cultural focal point. The siting techniques described above can reduce impacts from scenic viewpoints.



### 6. What is the Duration of View?

If the turbine is seen only briefly, the impacts will be less than if it is seen over an extended period of time.



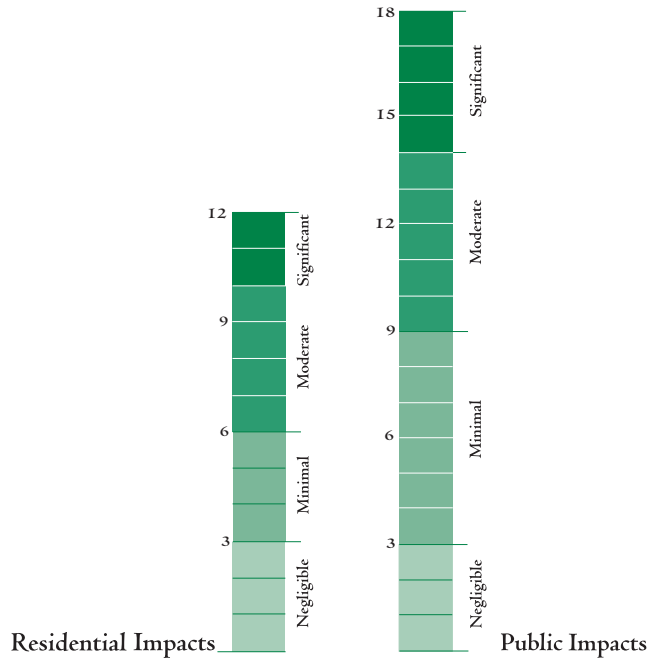
## Rate Your Turbine

Add up your scores for each question. A total of 12 possible points can be scored for each view from your neighbors' property (questions 1-4), and a total of 18 possible points from a public viewpoint (questions 1-6). If your turbine scores below the "significant" zone, it is less likely to interfere with public or private views.

You can use the techniques described above to further reduce your turbine's visual impacts.

**Note:** This scoring system is only a general indicator, and only addresses siting. Other factors may exist that affect the overall visual characteristics of your turbine.

In general, your turbine is likely to be quite visible, but unless it is seen at close range in the center of an important scenic view, it is unlikely to cause significant visual impacts.



## Produced for the Vermont Public Service Board

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*This booklet was produced under contract by Jean Vissering, Landscape Architect, as an aid for siting small, net metered wind turbines. The contents represent the opinions of the consultant only, and should not be assumed to predict the outcome of any particular case before the Public Service Board.*

*All the photographs in this brochure feature turbines permitted in Vermont.*

