

Assessing Wind

Determining Your Wind Resource

You want a wind system, and have researched turbine, towers, and installation companies. But one critical question remains: Will it generate the energy (kWh) that you need? To answer, you need to know the average wind speed at the tower height required for your site.

Arriving at a wind speed number is not easy, and getting it wrong can have serious ramifications, since a wind turbine's output is related to the cube of the wind speed. For example, an 8 mph wind will yield only half the energy that a 10 mph wind will. You need a good idea of how much "fuel" you might have.

A wind site assessor will be able to best estimate the average wind speed at your site. Expect to pay \$200 to \$600 for a boots-on-the-ground visit followed by an in-depth report. While this might seem like a lot of money, consider the risk of putting up a \$30,000 to \$80,000 wind system without full knowledge of the resource. Even those who decided against a wind system concur that a site assessment is money well spent.

Online site assessments for comparable prices are available, but they are less reliable than a personal on-site visit. Some manufacturers offer online wind estimates based on your address, but with a financial stake in your decision to purchase, most of these "assessments" are too optimistic.

Before you hire an assessor, there is a do-it-yourself method to get a ballpark wind speed. This will help you determine if you should even consider a wind system, or if hiring an assessor is justifiable. First, consult the up-to-date wind resource maps at Wind Powering America (bit.ly/WindMaps). Click on your state and view a model of the average wind resource for your "area."

These maps not site-specific, but rather a two- by two-kilometer resolution interpolation. The map cannot give the wind speed at your required tower height (at least 30 feet above anything within 500 feet and the mature tree heights in your area). To fine-tune this number, you'd also need to know your tower site's surface-friction coefficient, turbulence intensity, prevailing wind direction, and displacement height. These are the four critical factors you need to understand to optimize your site's wind speed.

To better understand all of this and why it's relevant, visit smallwindtraining.org. The "Site Assessor" tab is a resource for site assessor training workshops. There's a lot to read, after which you'll have a good idea of where and how to site your system. Finally, ask nearby wind system owners about their experiences—and what they might do differently.

—Mick Sagrillo

Average Wind Speed (m/s) at 30 m

