

**NYSERDA**

# The Power of Wind



USING WIND TO POWER YOUR HOME, FARM, BUILDING, OR BUSINESS

[www.PowerNaturally.org](http://www.PowerNaturally.org)



**Thanks to new technology, wind energy is becoming a viable energy source.**

But there is nothing new about harnessing the wind for power; we've used wind for centuries to power everything from ships to flour mills and water pumps. Today, large commercial wind sites are becoming more common, but there are also applications for smaller wind turbines at residential, industrial, agricultural, and educational sites. **The New York State Energy Research and Development Authority (NYSERDA)** is firmly behind the growth of wind power and offers cash incentives to help New Yorkers install wind turbines (see [www.PowerNaturally.org](http://www.PowerNaturally.org)).



# Why

## WIND ENERGY ?

When you harness the wind, you're creating a

### **free, renewable energy source**

that will reduce the amount of electricity you purchase. Because it is renewable and non-polluting, it helps to protect the environment, increases energy self-sufficiency, and will help protect you from future electricity price increases.

# How

## DOES WIND POWER WORK ?

The sun heats the earth unevenly, creating wind. Wind turbines harness this energy and convert it into clean, sustainable energy. A small wind turbine consists of

- **A rotor (usually two or three blades)**
- **A drive shaft with support bearings**
- **A generator**
- **A tail to keep the turbine properly directed**
- **A tower**
- **A foundation/guy wires to stabilize the structure**

## WHAT IS THE

# financial benefit ?

When you're considering the financial benefits of wind, you should look at not only the cost of the wind turbine, but also the cost you currently pay for electricity. For example, if you pay 14 cents per kilowatt-hour (kWh), have an average wind speed of 12 miles per hour (mph) on your property, and install a 10 kW wind turbine, you can expect it to pay for itself in approximately 25 years. If the wind speed is increased to 14 mph, the payback decreases to 16 years. Cash incentives offered by the New York State Energy Research and Development Authority (NYSERDA) can cut the payback in half. See [www.PowerNaturally.org](http://www.PowerNaturally.org) for information on incentives.

## HOW DO I DECIDE IF IT'S **right for me ?**

**Site selection is the first critical area to explore.** You should have an annual average wind speed of at least 10 mph on your property. To help determine this, you can consult the wind map created for NYSERDA at [www.windexplorer.com](http://www.windexplorer.com).

But remember that local terrain, buildings, and vegetation can affect this measurement.

Also, look for flagging — this is the term used to describe trees that are deformed by strong wind. Lastly, you can install a small meteorological tower. While this is an accurate guide to wind speeds, it can be prohibitively expensive.



## What else IS INVOLVED ?

Once you've determined that the wind speed on your property is 10 mph or more, there are a number of other areas you'll want to examine before moving ahead.

**Do you have enough space for a wind turbine?** You should have at least an acre of land with a suitable location set back from trees, buildings, and property lines.

**How complicated and expensive is it to connect your wind turbine to the electric grid?** You'll need to be connected to the local electric grid in order to reduce your purchase of electricity. Find out what is involved in connecting your system in your specific locality, since rules and regulations vary. Also, consider how close your turbine will be to a connection point, because the farther away it is, the more it will cost to run an electrical line.

**What permits and approvals are needed?** You will want to speak with local government representatives to determine any building permits, electrical permits, approvals, and certifications that are needed prior to installing a wind system. This is a critical phase, and it is vital that you have all approvals in place before ordering your equipment or beginning any installation.



**What is the impact on neighboring properties?** Think about how close your turbine might be to any buildings, neighboring property lines, or environmentally sensitive areas, such as bird habitats, wetlands, and historical preservation areas. Your neighbors may be concerned about the visual impact of the tower and turbine, so you should discuss this with them before proceeding. People are often concerned about the potential noise of the system, but a wind turbine typically creates no more noise than the average home refrigerator.

**What is access like on your property?** Difficult access, soil type, and terrain can all impact the cost of constructing a wind turbine, so investigate all of these issues before proceeding.

**How are small turbines connected to the grid?** Most small turbines are sold with an inverter that converts the electricity to alternating current (AC) so it is compatible with the electricity grid. It is essential that you work closely with your installer and local utility to ensure that your wind system complies with all utility regulations and receives all necessary approvals before your system is connected.

**How do I choose someone to install my wind turbine?** Be sure to get several estimates when choosing a supplier and installer for your wind turbine. Ask about their training, ensure that they have adequate insurance, and find out what monitoring they provide once the system is up and running. See [www.PowerNaturally.org](http://www.PowerNaturally.org) for a list of eligible installers.

**How much will a system cost?** A general rule of thumb is that a small system can cost from \$1,500 to \$6,000 per kilowatt. Installation costs can add another 25 percent to the purchase cost. A typical 10 kW grid-connected system on an 80- to 120-foot guyed tower can cost between \$45,000 and \$60,000. Annual operation and maintenance costs might range between 1 and 3 percent of the initial installation cost.

WHERE DO I GO TO  
**find out  
more?**

There are many excellent resources to find out about wind power and its potential to reduce your purchase of electricity.

The NYSERDA website at [www.PowerNaturally.org](http://www.PowerNaturally.org) has full details on wind power, including incentive programs that are being offered for the installation of both large and small wind systems.

The American Wind Association ([www.awea.org](http://www.awea.org)) is another valuable resource and wind maps for New York State can be found at [www.windexplorer.com](http://www.windexplorer.com).

*If you're interested in a wind system for your home, farm, building, or business, then the first step is to get in touch with NYSERDA.* We can provide you with more detailed information, including a list of wind installers in your area who are participating in the NYSERDA incentive program. You may want to speak with several installers and consider getting bids so you can compare costs and services. These participating installers will provide you with an estimate of how much energy your system will produce, plus a minimum five-year warranty covering full costs, including labor, and repair or replacement of defective components or systems.

Making the change to wind is easy, and you can get started with a phone call or a visit to our website.

***For more information,*** visit us at **[www.PowerNaturally.org](http://www.PowerNaturally.org)**  
or contact us at **1-866-697-3732.**

***Wind power makes sense for so many reasons.  
It's right for the environment, and now is the right  
time to take advantage of extraordinary savings.***

---

