



## **Information on Do it Yourself Towers for Homemade Wind Generator**

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**July 29, 2009** - [PRLog](#) -- For the Do-It-Yourself builder thinking about wind generators as an solution for homemade alternative energy, one of the considerations has got to be the tower that the generator and blades will be mounted on. The size and location of the wind generator system is generally the determining factor in tower choices. Obviously cost considerations factor into the ultimate decision. For that reason and others, compromises are often made to accommodate any particular situation. The tower is definitely one of the most critical elements to successful homemade wind generator energy production and so deserves careful and justifiable concern. One of the most common causes of system failure or abandoned DIY wind energy projects revolves around the tower. (No pun intended)

There are several standard types of towers in use for wind generation. Towers for large wind turbines may be either tubular steel towers, lattice towers, or concrete towers. Most large wind turbines are delivered with tubular steel towers, which are manufactured in sections of 40-50 feet with flanges at either end, and bolted together on the site. The towers are conical (i.e. with their diameter increasing towards the base) in order to increase their strength and to save on materials cost. These towers are seldom used by DIY alternative energy homeowners.

Lattice towers are manufactured using welded or bolted steel profiles. The basic advantage of lattice towers is cost, since a lattice tower requires only half as much material as a freely standing tubular tower with a similar stiffness. The basic disadvantage of lattice towers is the labor required to assemble and their visual appearance is not as accepted as solid tubular towers.

Most small wind turbines of the type commonly used for residential alternative energy sources, are built with narrow pole towers that are sometimes supported by guy wires. They have several advantages for the DIY wind energy builder, the most obvious being weight. Most homemade energy systems builders do not have ready access to the equipment necessary to raise and support large, heavy towers. The disadvantages are that because of the support wire system, access around the towers may be difficult or inconvenient.

Some towers are made in different combinations of the techniques mentioned above. One example would be a multi-legged tower much like the traditional "windmill" tower, which may be said to be a hybrid between a lattice tower and a guyed tower.

The price of a tower for a wind turbine is generally around 20 per cent of the total price of the wind generator system. It is important to build towers as optimally as practical in order for the final cost of the alternative energy produced to be as reasonable as possible. For most homemade wind generator systems, pole towers are sufficient, cost effective and reliable if constructed properly. Lattice towers are the second choice of DIY wind energy builders since they are relatively cheap to manufacture, typically require about half the amount of steel used for a mid-size tubular steel tower and can be assembled on site.

Since wind speeds increase farther from the ground, it is generally an advantage to have as tall a tower as is

reasonable. Obviously, you get more energy from a larger wind turbine than a small one, but clearly it makes no sense to fit a 7 foot rotor to a tower of less than 10 feet. Additionally, if we consider the cost of a large rotor and a large generator and gearbox, it would surely be a waste to put it on a small tower especially since we get much higher wind speeds and thus more energy with a tall tower. Another consideration is that the rotor blades on turbines with relatively short towers will be subject to very different wind speeds (and thus different bending) when a rotor blade is in its top and in its bottom position, which will increase the fatigue loads on the turbine and the bearings.

Each foot of tower height costs money and increases the difficulty of installation for the DIY wind energy builder, so the optimum height of the tower is a function of efficiency vs. cost which ultimately translates into the price the turbine owner gets for an additional kilowatt hour of electricity.

Knowing a few facts about the local wind patterns, dynamic loads created by the wind generator on the tower and cost of materials are things any Do-It-Yourself wind generator system builder should be aware of before they venture into a homemade wind energy project.

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