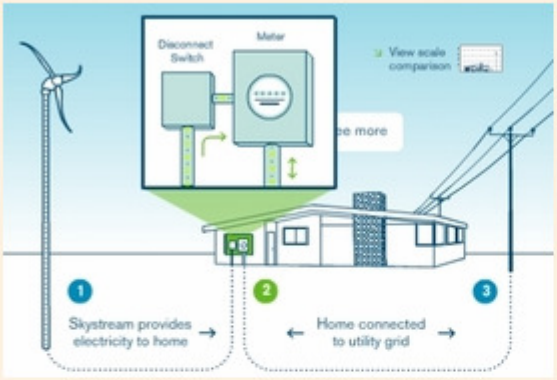
Weird & Wireless: Adding wind power to your home



Welcome again to the wonderful but sometimes weird world of wireless comms, written by Joel Young, ***CTO of Digi International***

What kind of impact can I get by adding wind power to my home?

Contrary to what I thought going into it, I've discovered that it's not yet all that easy or cost effective to be really green, at least when it comes to being electrically self-sufficient (at least in my neighborhood).

The past few weeks I set off to try to look at how I could self generate a good chunk of the electric power for my house. This is part one of a two part blog on green power.

Why not wind? My house sits on the top of a hill with, what I've thought was, typically a steady breeze. Now it turns out that my house uses on average about 24,000 kWh per year. At an average rate of 10.5 cents per kWh, electricity costs me over $2,500 per year.

The usage significantly increases during the summer months. For wind, there is up to a 30% tax credit but the formula gets a bit complicated because it is a combination of the rated capacity of your wind system and how much you actually paid.

Of course there are many variants of antennas and they now come in all shapes in sizes the goal of squeezing them into small places or focusing the direction.

This means that if you overpay for little capacity, your credit won't be very large. In addition, it appears that my local utility may also provide another 20% (or so) credit.

In addition to the potential credit, one of the nicest things about being tied to a utility is that there is no need to get a bunch of batteries or charge controllers. Both wind and solar have grid tied systems, which means that if you don't generate enough power for your home, you can still buy some from the utility and if you make too much, you can generally sell the surplus back to the utility.

In the quest for wind turbines, there appears to be three important factors: your average wind speed, building and zoning rules and, of course, whether or not you neighbours will be happy with a giant wind turbine over the house.

First, with respect to zoning, it will vary much by municipality. In my city, I couldn't find any explicit restrictions on neighbourhood wind turbines. However, I did find that that the limit to free structures, not connected to the house, was 15 feet and the limit to a structure connected to or as part of my house could be no taller than 40 feet.

With a 27 foot house, I have 13 feet to spare if I didn't want the wind turbine to be obstructed.

Next was wind speed. By surveying the national weather service, I was able to discover the average wind speed on my street was 10 miles per hour. At first that sounded to me like quite a bit, but I soon learned I really could use more wind.

As far as the neighbours, if they protested, I would use the "I'm protecting the planet for my children" argument.

In my quest for a wind turbine, I found the Skystream 3.7 for about $8,000. The turbine itself costs a bit less, but you need to mount it to something. At 12 feet in diameter and a rating of 1,800 watts, it appeared to have a nice bit of power. Then reality hit.

The table below illustrates a model at different AVERAGE wind speeds. The focus here is on average because wind never just blows at a constant speed over the course of a year and the efficiency of the turbine actually goes down when the wind gets above 30 mph.

Wind mph	Efficiency	kWH/yr	Avg Watts
8	8%	1300	148
10	17%	2700	308
15	43%	6800	776
20	57%	9000	1027
25	65%	10200	1164

To get a good amount of power, you really need wind close to 20 mph, with the best being between 25 and 30 mph. At an average of 10 mph, the real output about is 300 watts, yielding a paltry 2700 kWh per year - 11% of my power needs.

After the 30% tax credit, the cost of $5,600 would have a payback period of about 20 years. Not good for my neighbourhood, so I guess my neighbours won't get to enjoy the 12 foot turbine above my house.

However, if I lived in a windy place of 20 mph wind, the payback is only 6 years.

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Prior to joining Digi, Joel was VP of Sales & Marketing at Transcrypt International where he was responsible for sales, marketing, and product development for all information security products. During his tenure at Transcrypt, he also served as VP of Product Development and VP of Engineering where he was responsible for engineering, research and product development for wireless communications products, cellular telephony, wireline telephony and land mobile radio, data security and specialized digital radio products.

He also served as District Manager for AT&T Business Communications Services where he was responsible for the creation and implementation of voice processing and network database strategies, including deploying new voice processing platforms into the AT&T switched network for private network and other outbound calling services.