In The Shadow of Big Wind

Washington State is not generally known for its good wind resource, but there are major exceptions along areas of the Columbia River which bisects and borders our state. One such area along the Columbia is Central Washington's Kittitas Valley. The approximate 700 square miles is the home of one of our state's first wind farms, and also contains the campus of Central Washington University, my wife's alma mater.

When we were looking for a site to put up our own small wind system, my wife, being well acquainted with the near continuous wind of her college days, suggested the Kittitas Valley. Our goal was to install a turbine to take advantage of our state's progressive renewable energy incentives (see Side Note 1), and to provide a platform with which to develop and test our monitoring solutions (www.RightHandEng.com). So our first step was to locate a suitable site within the Valley. After looking at several properties, we found an area with several homes for sale, and one owner told us that they were selling because a new wind farm was destined for their "back yard" and they were afraid of a drop in property values. This sub-area of the valley got our attention because we knew that wind farms only appear where the wind is good. We confirmed our suspicions by looking at the wind maps and data from the local airport. We finally settled on an 8 acre parcel, and after going through the permitting hoops we purchased a used Bergey Excel turbine and 100' tower and moved it to the site (see *A Second Wind*, by Ian Woofenden, Home Power Magazine, Issue 130).

Two years later, the Kittitas Valley Wind Farm (KVWF), owned by Horizon Wind Energy, appeared upwind of us, with a few of its 48 large 2.1 MW turbines about a mile away (see Table 1 for turbine comparison). This article is about our experience with having "Big Wind" as a neighbor; how we have impacted each other, and our neighbors.

Our first encounter with the impact of the KVWF came two years before it was built – when we went to get a permit with our county. Although wind farms fall under much different section of state and county code than the residential building code, having wind farms in the county did prompt the community development department to draft a small wind ordinance. However, that ordinance was not yet in effect at the time we permitted our system – and that turned out to be a good thing. As we soon discovered, the planned KVWF (the third wind farm in the valley, but the first in inhabited areas) was controversial and not very popular with a significant portion of the local population because the State overruled the County's rules for wind farm turbine setbacks from adjacent properties, allowing these turbines to be much closer to adjacent property than the County was allowing – a very unpopular thing among county land owners. Perhaps in reaction to State interference, the draft small wind ordinance

proposed restrictive rules for small wind which could have reduced the production of our turbine by increasing the setback and reducing the tower height. But since those rules were not yet in effect, we were able to keep our 100' tower, and place it at a favorable location on our property.

Our next experience was with neighbors. Realizing that perhaps wind power of any size might not be popular among our neighbors, we took the advice of small wind advocates Ian Woofenden and Mike Sagrillo, and proactively contacted our property line neighbors to tell them our plans of installing a turbine, and to give them some idea of what they could expect. We were fortunate that none of them objected – otherwise it could have been an issue getting a permit.

As other neighbors in our homeowners association began to see our preparations for erecting our wind turbine, we began to see that not all of them were as accepting of wind power as our next-door neighbors. But the 2008 National Solar Tour day occurred just weeks after our turbine went into operation, and we took that opportunity to invite all the neighbors in the association to come see our system. We were pleased to learn from them that seeing our system on a daily basis, changed the minds of several in our neighborhood, to the point that they were no longer antagonistic against the future wind farm. In our case, small wind may have done big wind a favor.

This past year, when the wind farm was nearing completion, we again participated in the National Solar Tour. The Valley's tour included the Puget Sound Energy, Wild Horse Wind Farm Visitor Center on the opposite side of the Valley from us. Since the KVWF does not have a visitor's center, we reached out to the wind farm's local project manager and offered to be an unofficial tour location for their farm – and they graciously provided us with facts and brochures which we handed out to tour participants.

Some of our friends have been curious as to whether the new wind farm, being up-wind from us by only 6400 feet, has "stolen" any of our wind. The answer is probably not. Accepted wind theory is that up-wind objects can disturb the down-wind flow for a distance of up to 20 times their height (see *Wind Power*, by Paul Gipe, page 271) and our turbine is at the end that zone. Of course, because I am in the business of developing monitoring solutions, I have been carefully monitoring my wind and energy production since my turbine went up, and with 8 months of being down-wind of the KVWF, we can't detect any abnormal reduction on our wind speed or energy production.

Some people who saw our 10KW turbine go up two years before the wind farm, say that our turbine was a "seed" for the farm. But in actuality, it was the other way around – the farm was the seed for our system. And I can say that our relationship with them has been very good. We are happy to have them in our "back yard".

	Richmond Windy Ranch	Kittitas Valley Wind Farm
Turbine	Bergey Excel	Suzion S88
Blade Length	11 feet	142 feet
Tower Height	100 feet	260 feet
Max Watt Output	10 kW	2,100 kW per turbine
Estimated Avg Wind Speed	12 MPH	Not disclosed
Estimated Annual KWhr	17 MWhrs	5,650 MWhrs per turbine
Households Powered[1]	1.8	625 per turbine

1. Based on an AWEA metrics (9 MWhrs/yr/household)

Table 1 Comparison of Author's turbine vs. KVWF turbines

Washington State's renewable energy incentive is performance-based and includes solar, wind and methane gas systems. The annual payout for wind systems is $0.12/kWhr for a maximum of $5000/year. For more information visit http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=WA27F&re=1&ee=1

Side Note 1 Washington State Renewable Energy Incentive