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SMALL TURBINE COLUMN:

Telecommunication Interference From Home Wind Systems

--Mick Sagrillo, Sagrillo Power & Light

This past week, I received three unusual phone calls from three wind system dealers in three different parts of the country. Their calls were regarding an issue brought up at the zoning hearings for their respective clients. All three calls were about any interference that the home-sized wind system might cause to a neighbor's TV or other telecommunications devices.

What a coincidence! I can only assume that something has recently been distributed on some anti-wind web site, or maybe published in the popular press, about home wind systems and telecommunications interference. Since this "problem" was news to me, I decided to thoroughly research these concerns with unbiased industry experts, namely Jim Green from the National Renewable Energy Laboratory (NREL), Paul Gipe, author of *Wind Power For Home and Business*, and Ken Starcher of the Alternative Energy Institute at West Texas A&M University.

The concerns raised by the zoning committees dealt with two basic ways in which the design of a wind turbine could potentially cause telecommunications interference.

The first is that the revolving blades could interfere with TV reception, "chopping up" the signal, which would result in a flickering image, or "ghosting," on the TV screen.

This problem has occasionally arisen with large utility-scale turbines. It turns out that this is a "line of sight" problem. That is, if a large utility-scale turbine is installed in the line of sight between the TV transmitter tower and a residential antenna, some chopping may, or may not, occur. The situation is easily rectified by either replacing the existing antenna with a larger, more powerful model or adding a reception booster to the antenna.

However, home-sized wind systems, in the 1 kW to 20 kW range, do not have the very large rotor diameters found on utility scale machines, and do not create ghosting interference. It's a valid concern for zoning committees and neighbors. But comparing home wind systems to utility scale equipment is sort of like comparing bicycles to semi trucks. While they both have wheels, and both get you from point A to point B, they are hardly comparable.

Ghosting did occasionally occur with a few home-sized wind systems available 20 or so years ago. The offending models all sported metal blades, which actually can reflect TV signals while rotating. However, this is ancient history, and home wind turbines are no longer available with metal blades. Today's home wind machines have blades made of wood, fiberglass, or plastic. All of these materials are "transparent" to telecommunications signals. Neither Jim Green nor Paul Gipe has heard of any problems concerning TV or telecommunications interference due to home wind systems.

The second concern is that the wind turbine's generator or alternator will emit electromagnetic interference or radio frequency interference, both of which could potentially interfere with telecommunications signals. Again, I came up empty handed regarding home-sized wind systems. Jim Green stated: "in the nearly 10 years I have worked in small wind, I have not encountered any incidents or problems related to electromagnetic emissions from small wind turbine generators. Consequently, studies have not been done on this topic, at least not to my knowledge."

Ken Starcher reported that "tests with power analyzers and observations at the Wind Test Center of the AEI-WTAMU campus showed no interference with radio/TV signals from the operation of (home wind turbines) or the electrical interface (from) renewable systems during the early 1990's."

Paul Gipe pointed out that "small wind turbines are used extensively worldwide to power remote telecommunication stations for both commercial and military uses. The turbines would never have been selected if there had been any hint of interference." Gipe goes on to add, "...[S]ome wind turbine operators have sought additional revenue by renting space on their towers for telecom dishes and antennas..."

Taking a lead from Gipe's comments, I decided to poll the manufacturers or their distributors about causing telecommunications interference. I was reminded that one of the major niche markets for home-sized wind systems is powering remote telecommunications sites. Applications include:

- cell phone towers,
- microwave repeater stations,
- radar installations for the FAA,
- military communications installations,
- wireless Internet sites,
- radio repeater stations,
- remote telemetry monitoring stations,
- remote telecommunications sites,
- TV and radio broadcast towers,
- ham radio sites,
- and sailboats (powered by micro wind turbines).

In addition, phone calls to Bergey WindPower, Southwest Windpower, Wind Turbine Industries, Proven Engineering, and African Windpower all revealed no complaints about communications interference due to any of their wind systems from any customer or their neighbors.

Finally, some home-sized wind turbines have been specifically tested for remote telecommunications applications, since stationary fossil fuel gen-sets can, and do, cause interference. For example, Bergey WindPower reports that "their products have been tested by the U.S. Navy and approved for use in military communication applications." However, because they do not have a reputation for causing interference, and because they have long been used for remote telecommunications sites, most equipment has not been tested. To paraphrase NREL's Jim Green, no tests have been done, because there have been no complaints.

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[Editor's Note: The opinions expressed in this column belong solely to the author.]