

Bringing Wind Turbines to Ordinary Rooftops

by ANNE EISENBERG New York Times February 14, 2009

WIND turbines typically spin from tall towers on hills and plains. But in these green times, some companies hope smaller turbines will soon rise above a more domestic spot: homes and garages.

The rooftop turbines send the electricity they generate straight on to the home's circuit box. Then owners in a suitably wind-swept location can watch the needle on their electricity meter turn backward instead of forward, reducing their utility bills while using a renewable resource.

One new model, the Swift Wind Turbine, is designed to do its job quietly, said Dave Anderson, co-director of Renewable Devices in Edinburgh, which has partnered with Cascade Engineering in Grand Rapids, Mich., to offer the turbine in the United States.

"The noisiest it gets is 35 decibels," roughly the sound of a quiet conversation, he said of the whir of the blades. The turbine, which looks like a large wagon wheel, has a ring around its blades designed to diffuse noise and limit vibration. "The air is steered toward the diffuser ring and dispersed, rather than leaving the blades with a ripping noise," Dr. Anderson said.

The turbine costs \$10,000 to \$12,000 including installation, said Michael Ford, manager of the renewable energy business unit at Cascade Engineering. When the wind is blowing briskly at 30 miles an hour or more, it will generate 1.5 kilowatts of electrical power, he said. Enough, for instance, to run fifteen 100-watt light bulbs.

"You need a strong average wind speed," he said, recommending that prospective customers make careful measurements before they buy. "Don't trust your memories about the wind power around your house," he said. "People always remember when it's windy," but forget about the lulls.

Residents may measure wind speed with an anemometer, often available for rent, as well as by entering their address at the [Swift Web site](#), which has listings of average wind speeds for localities.

The Swift turbine starts contributing electricity when the wind blows at eight miles an hour; as the wind speed increases, so does turbine output, said Mr. Ford. Over a year, the energy output in windy locations should be roughly 2,000 kilowatt hours, he said, so that for homes that use 11,000 kilowatt hours in a year, for instance, electricity costs

would be reduced by about 18 percent.

Kenneth Benefiel of Conklin, Mich., bought a Swift turbine last fall, and had it installed on his 150-year-old post-and-beam barn, now a garage and workroom, in time for Christmas. "I had already switched to energy efficient appliances," he said, reducing electricity usage by a third by buying a more efficient freezer and refrigerator and changing to fluorescent light bulbs. "The turbine was the next step."



Kenneth Benefiel has a Swift turbine on his home in Conklin, Mich. *Adam Bird for The New York Times*

will suffer from small wind speeds and a lot of turbulence," he said. Dr. Mertens offers a spreadsheet at his Internet site, www.ingreenious.com, that can be downloaded by people who want to do their own calculations for optimum turbine placement.

The American Wind Energy Association, a trade group in Washington, recommends placing the turbine at least 30 feet above anything in a 500-foot radius, said Ron Stimmel, a specialist in small wind turbines at the trade group American Wind Energy Association, in Washington. "That way the wind can stretch its legs a bit." For these taller towers, homeowners should be aware that they may have to deal with local rules prohibiting structures higher than 30 feet or so.

State and federal incentives will whittle down the price tag for many prospective buyers. For instance, about half the states have some sort of incentive, Mr. Stimmel said. The New York State Energy Research and Development Authority, for instance, covers up to half of the homeowner's initial cost for a wind turbine.

Another small wind turbine for residences is the Energy Ball, to be sold in the United States by Home Energy Americas, in McKinney, Tex. Robert Thompson, its chief executive, said he hoped to have the turbines on the market shortly. The Energy Ball is shaped like an eggbeater placed sideways, so that its blades turn around a horizontal axis. One model, the V100, will cost \$10,000 to \$11,000 installed, he said, and will provide a maximum of 500 watts. One way to mount it might be on a cupola, Mr. Thompson said, "just like you would mount a weathervane."



An Energy Ball turbine. *Adam Bird for The New York Times*

Mr. Benefiel, who is a retired carpenter, said that in the first five weeks after its installation, the turbine produced about 60 kilowatt hours of electricity, enough to power his house for about three days. The machine is quiet, but the old building to which it is mounted does its share of groaning in a stiff wind, he said.

So far, he is satisfied with his purchase. "The turbine will conserve energy," he said. "It's making us more self-sufficient, and we're doing our part to cut consumption. You have to think not only about saving money, but about saving resources."

Turbines must be placed well above the roof to benefit from wind energy, said Sander Mertens in Voorburg, the Netherlands, who is a consultant in wind energy and author of "Wind Energy in the Built Environment."

For a two-story building, for instance, the turbine should be at least 15 feet above the roof. "Put it lower, and you