

# Power your homestead with renewable energy

by John D. Ivanko

There are times when my wife and I (and son) come inside after working in the gardens with red faces, not from sunburn, but windburn. Sitting high on the ridge where we can see for many unobstructed miles in any direction, our place, Inn Serendipity, in southwest Wisconsin, is well situated for electricity generation with a residential scale wind turbine. It helps that we also operate a small organic farm in the country, so we have enough space for one.

Not to be confused with the old abandoned windmills – designed to mechanically pump water from wells or grind grains, some still dotting the countryside across parts of the United States – a wind turbine generates electricity by using the wind, a renewable energy source. Unlike coal-fired power plants or nuclear reactors, wind turbines generate electricity without creating any water or air pollution – or leaving behind toxic waste for thousands of years.

The large commercial-sized turbines seem to get all the press these days, huge towering sentinels with slowly sweeping blades longer than a wing on a Boeing 747. Many towering over 180 feet in the air, they generate vast amounts of energy (measured in the megawatts) and have a price tag to match, costing more than a \$1 million to put up. These systems are typically set up as wind farms, grouped together in high wind areas along windy overpasses or coastal areas. These wind farms often generate electricity for tens of thousands of homes.

But our wind turbine is a residential-sized system, grid-connected, and rated for electricity generation at 10 kilowatts (kW). Residential systems range from small .5 kW turbines on modest poles to a larger 20 kW residential system placed atop a steel lattice tower. Besides the wind turbine system, we operate a 780-watt photovoltaic system, a solar thermal system for our domestic hot water and another solar thermal system to heat our straw bale greenhouse, have extensive energy conservation practices and green building technologies, and have learned enough about growing our own food to be able to meet about 70 percent of our food needs, all of which we detail in our book, *Rural Renaissance*.

An off-grid, .5 kW photovoltaic (PV) system at Inn Serendipity, used to recharge an all-electric CitiCar and electric lawn mower.

Being grid-tied, or connected to the utility grid, our wind system avoids the bank of batteries needed for energy storage. When we overproduce in any given year – which we regularly do now – our net metering contract with the public utility entitles us to a credit check. We over-produce about 3,000kWhs annually.

## Being Your Own Power Producer

There are some general steps we've discovered to guide your efforts to generate your own electricity from a residential wind turbine system.

### (1) Exhaust Energy Conservation & Efficiency Options

According to the Midwest Renewable Energy Association, for every \$1 spent on conservation or efficiency, it's equivalent to \$3 spent (or saved) on renewable energy generation systems.

### (2) Investigate Renewable Energy System Options & Funding

Renewable energy fairs, workshops, books and websites provide the tools and know-how.

### (3) Site Assessment

This will help determine your renewable energy resources, usually conducted by experienced professionals whose opinions often help in the final determination of possible grants and rebates.

### (4) Apply for Funding Support



## (5) Connect with Community

### (6) Zoning Permits & Public Hearing (if applicable)

Usually for larger systems or towers higher than 100 feet. County and city/township requirements vary widely by county. Knowledge of other systems in your area and state statues (if available) related to solar and wind energy helps.

(7) **Order Equipment:** Allow as much time as possible and sort out alternatives to shipping costs.

(8) **Sign Grid Interconnect Contract with Utility (as needed):** Avoid costly surprises by making sure the utility is involved.

(9) **Pour Foundations (as needed):** Given all the cell towers going up, choose contractors with related experience.

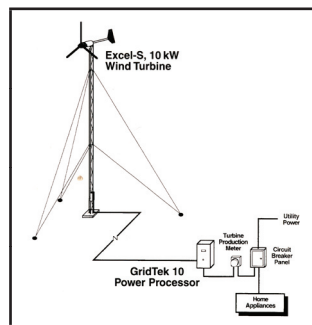
### (10) Installation of System

If possible, hire those who have the know-how to troubleshoot problems. Welcome helping hands or host educational workshops.

(11) **Take Advantage of Tax Breaks at Tax Time**

### (12) Monitor System

Routine maintenance and "visual" monitoring is needed.



Block diagram of basic grid interconnected wind turbine system (above).

## Resources

*Rural Renaissance: Renewing the Quest for the Good Life*, by Lisa Kivirist and John Ivanko

*ECOprenuring: Putting Purpose and the Planet before Profits*, by Lisa Kivirist and John Ivanko

**Midwest Renewable Energy Association (MREA)**

Website: [www.the-mrea.org](http://www.the-mrea.org)

Hosting the world's largest renewable energy and sustainable living fair, the MREA also features the ReNew the Earth Institute headquarters which demonstrates how energy independence is viable today with a hybrid system incorporating solar electric, solar thermal, wind and woodstove heat to meet energy needs.

**Database of State Incentives for Renewable Energy (DSIRE)**

Website: [www.dsireusa.org](http://www.dsireusa.org)

Locate what incentives or renewable energy rebates might be available in your state.

## About Inn Serendipity® Bed & Breakfast and Farm

Completely powered by the wind and sun, the award-winning Inn Serendipity is among the "Top 10 eco-destinations in North America", Travel Green Wisconsin and Green Routes certified, and earned "5 Green Stars" from Eco Hotels of the World. The Inn features hearty vegetarian breakfasts prepared with ingredients mostly harvested from the Inn's organic gardens. The innkeepers-authors' book, *Rural Renaissance*, details their journey on their 5.5 acre farmstead, located outside Monroe, Wisconsin, and contains both personal stories and practical resources. [www.innserendipity.com](http://www.innserendipity.com)



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Crew from MREA's wind turbine installation educational workshop.

### Focus on Energy

Website: [www.focusonenergy.com](http://www.focusonenergy.com)

For Wisconsin incentives for renewable energy and conservation.

### National Tour of Solar Homes

Website: [www.ases.org](http://www.ases.org)

Coordinated by the American Solar Energy Society, this annual national tour held early October offers the opportunity to visit and tour homes and businesses that incorporate myriad renewable energy, energy conservation products, and green design elements into their homes or businesses.

### Renewing the Countryside

Website: [www.renewingthecountryside.org](http://www.renewingthecountryside.org)

Aims to strengthen rural areas by highlighting the initiatives and projects of rural communities, farmers, artists, entrepreneurs, educators, and activists.