

## Mini Windmill Provides “Low Wind” Power

Forget about swapping out batteries on remote electric fences or water pumps and bringing them home to recharge. This new mini windmill keeps batteries charged, fences hot and can even power a water pump. All it needs is a little wind and not as much as you'd think.

“You can stick one of these on a fence post or weld it to a piece of pipe and stick it in the ground,” says Terry Galyon, TLG Windpower Products. “It'll produce 1 amp with a 5 mph wind. The more the wind blows, the more it puts out, hitting 35 amps at 38 mph.”

Galyon says the generators, rated at 500 watts, shut down automatically in higher winds. The rotor diameter is only 5 ft. so they can be positioned near the ground.

The most attractive feature of the new windmill is its simplicity. It uses an advanced rotary flux alternator to produce high frequency, three-phase AC power at the top of its tower. This lets operators use a regular three-wire extension cord instead of the ex-

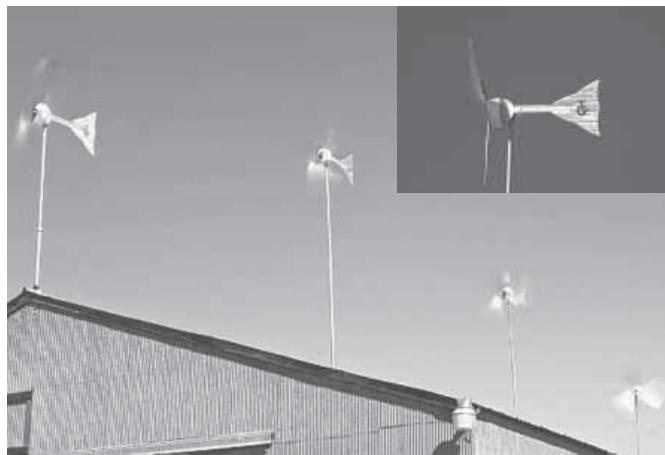
pensive wiring needed for DC systems. At the battery bank, the wires attach to a three-phase bridge rectifier (supplied with the unit). The rectifier turns the three-phase AC into two wires to connect to the DC positive and negative battery terminals.

While the TLG windmill is heavier than competitive small turbines, Galyon says it's the heavy-duty shaft, bearings, copper windings and large magnets that produce the high power output. He reports it produces 113.2 watts of output at 15 mph.

Priced at \$1,125, Galyon suggests payback within 18 months to 2 years. Of course convenience may outweigh economic payback. The simple design makes the TLG a natural for use at remote sites for pumping water every few days or to provide lights in an off-the-grid barn or cabin.

Galyon encourages visitors to his website, where he says he “gives away” information. “I believe we have the world's largest do-it-yourself renewable energy site,” he adds.

Contact: FARM SHOW Followup, TLG



**Mini windmill keeps batteries charged, fences hot and can even power a water pump. It uses an advanced rotary flux alternator (inset) to produce high frequency, three-phase AC power.**

Windpower Products, Nickerson, Kansas 67561 (ph 620 422-3700; fax 620 422-3702; terry@tlgwindpower.com; www.tlgwindpower.com).

## “Plug And Play” Windmill Developed By Rancher

Set it up. Plug it in. Let the wind blow. Harvesting power from the wind is just that simple with a Skystream 3.7 wind generator. With its built-in inverter, the Skystream doesn't need battery packs or extra equipment. Put up the pole and go. At an average wind speed of 12 mph, it will produce approximately 400 kW hours per month.

“Big wind generators are great, but they start at about \$1.5 million,” says Andy Kruse, Southwest Wind Power, Flagstaff, Arizona. “People can afford ours at \$5,100. They're designed for the farm, ranch or rural home owner.”

Beyond price, there are other features that make the Skystream ideal for consumers. It is ready to plug into the home electrical circuit to replace purchased power. Any excess energy generated goes back into the grid, reversing the meter and earning the homeowner credit against his bill.

Working on rural installations takes Kruse back to his beginning in wind energy. As a rancher, he tired of chopping ice from water tanks through the winter. Using wind to

power bubblers led him to wind energy and finally to Southwest Windpower.

The small generator also requires less wind (8 mph) to start up. Ideal wind speed starts at 12 mph versus 15 for large units. It continues generating at speeds up to 60 mph before kicking out. Sensors in the system constantly monitor machine temperatures, energy produced and wind speed to determine when shut down is needed. A remote control unit controls the entire system.

The three 12-ft., fiberglass reinforced, composite rotors power a gearless, permanent magnet, brushless alternator. The entire unit weighs only 170 lbs. It's now available and ready to be used in a North American grid configuration and in marine and battery charging configurations.

Even the pole is simple. “Suggested pole height starts at 35 ft and goes to 110 ft,” says Kruse. “We suggest being at least 20 to 25 ft. above surrounding objects in a 200 to 250-ft. radius.”

Skystream 3.7 wind generators have a suggested retail price of \$5,100. With an assumed

total cost of \$8,500 (including installation), the system can have a payback in as little as four years, depending on rebates, tax credits and local energy costs and wind speeds.

“Energy costs are going up as much as 75 percent in some areas of the country,” says Kruse.

He suggests that small windpower generators could look even more attractive if current federal legislation passes. A bipartisan bill could provide a tax credit as great as 30 percent of the cost of a turbine.

Southwest's website offers access to wind speed maps and other information to help buyers decide if wind generation is right for them and what incentives, credits and grants are available in their states.

Contact: FARM SHOW Followup, Southwest Windpower, 1801 W. Route 66, Flagstaff, Arizona 86001 (ph 928 779-9463;



**With a built-in inverter, the Skystream doesn't need battery packs or extra equipment. Just put up the pole, plug into your home electrical circuit, and let it run.**

info@windenergy.com; www.skystreamenergy.com).

## Save Money With Used Windmills

As first generation wind energy turbines are being replaced by newer and larger turbines, the older machines are being refurbished and offered for sale. There are two companies in Minnesota selling 40kW Aeroman turbines with 50 to 75-ft. towers.

Wind Song Energy, Fergus Falls, Minn. is hoping to get its first unit installed this spring with more to follow, according to owner Dennis Tuel. He estimates a turnkey system will cost around \$85,000, depending on site variables. Published reports suggest that thousands of these turbines may be available for refurbishing/resale over the next few years.

Tuel suggests his systems will pay for themselves in six years or less, depending on federal and state tax credits and local electrical rates.

Next Generation Power Systems in Pipestone, Minn., installed eight recycled turbines in 2006 and plans to put up 30 or more in 2007.

Contact: FARM SHOW Followup, Next Generation Power Systems, 1502 17th Street SE, Pipestone, Minn. 56164 (ph 507 562-8090) or Dennis Tuel, Sr., Wind Song Energy, 23439 Big Chief Rd., Fergus Falls, Minn. 56537 (ph 218 739-4645).

## Fertilizer Blowing In The Wind

Everybody knows that nitrogen is in the air we breathe along with oxygen and other gases. Mike Reese has an idea for using wind power to produce anhydrous ammonia. The University of Minnesota researcher is setting up a pilot project using a 1.65-megawatt wind-powered generator. He plans to be producing fertilizer by fall 2007.

“It is essentially the same process that was used in the original development of synthetic fertilizer,” says Reese.

In fact, the University of Minnesota is collaborating with Norsk Hydro, the Norwegian company that developed that process in 1905. It used electricity to create a plasma arc to pull nitrogen from the air and to produce fertilizer.

“We will use wind power to produce electricity to power an electrolyzer that separates hydrogen from oxygen in water,” explains Reese. “Once the nitrogen is stripped from the air, it will be combined with the hydrogen in a reactor to produce anhydrous ammonia.”

One advantage to the new process is size. Anhydrous ammonia produced from natural

gas requires a large production facility for economy of scale. Because the wind-powered process uses pure hydrogen, a much smaller facility is possible. The pilot plant will use a 400 kW electrolyzer and a reactor to produce about a ton of anhydrous ammonia per day.

“A plant could be geared to local coop production,” says Reese. “You would eliminate transportation and handling.”

The costs for anhydrous ammonia produced with the wind-powered process would be higher than that currently produced with natural gas. However, Reese points to increased demand for natural gas and the dramatic rise in price in recent years.

“If capital costs and wind energy costs are fixed, the price for fertilizer produced with this process could be constant for 20-25 years,” he says. “It would eliminate a lot of the risk in fertilizer volatility.”

Contact: FARM SHOW Followup, Mike Reese, West Central Research and Outreach Center, 46352 State Hwy 329, Morris, Minn. 56267 (ph 320 589-1711; reesem@morris.umn.edu).

### How To Reach Us

To submit a “Made It Myself” Story Idea, New Product, Shop Tip, “Best or Worst Buy”, or other information, send a note along with photos, drawings and literature, if available. We'll get back to you later if we need more details. Send to: Editor, FARM SHOW, P.O. Box 1029, Lakeville, Minn. 55044 (ph 800 834-9665; fax 952 469-5575); email: editor@farmshow.com. You can also submit information at our website: www.

farmshow.com.

To change your address, renew your subscription, take out a new subscription, order videos or books, or for other information regarding your subscription, contact: Circulation Department, FARM SHOW, P.O. Box 1029, Lakeville, Minn. 55044 (ph 800 834-9665; fax 952 469-5575; email: circulation@farmshow.com).