

## WindStream Technologies

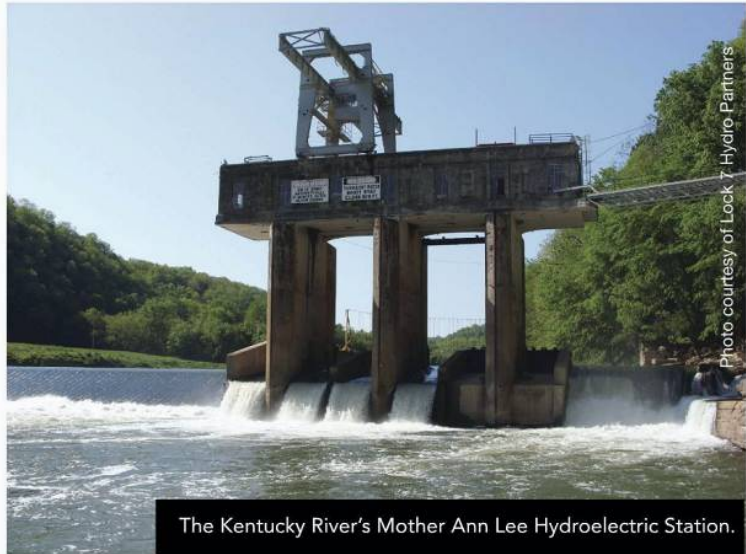
The Louisville area now has a high-potential start-up company offering a wind-energy option for homeowners and owners of small commercial structures. WindStream Technologies Inc., which last November announced plans to relocate from the Los Angeles area to New Albany, has reached the prototype phase in the development of small-scale “turbo-mills” designed to cut utility costs and pay for themselves in as little as three years.

President Dan Bates says he and his investors (including a few from Louisville he prefers not to identify) saw a need for wind-powered energy sources in the urban landscape, with smaller units that could conform to existing building codes and operate at lower wind speeds than the taller, larger turbines in rural areas. “We have focused on how you collect the energy in that low-turbulence boundary area in urban settings,” says Bates, who is relocating to the Louisville this year area along with his company.

The entrepreneur, whose background includes electronic music scoring for movies and audio applications for video games, began developing a concept for the WindStream product in 2007 and later called in fluid-dynamics and electro-magnetic experts to complete the design process. Their model impressed investors and a few key local institutions. In partnership with the Speed School at the University of Louisville, WindStream has opened a “rapid prototype facility” and developed a wind tunnel for product testing. It is working with Purdue University at the Purdue Technology Center in New Albany on fluid-dynamics projects, and it will assemble its turbo-mills at that location. Incentives of more than \$1.5 million from the state of Indiana and the City of New Albany helped lure the company here.

While he will not divulge the expected cost or dimensions of the product, Bates says that he expects full-scale prototypes to be in operation this month or next. A home would have several of them — a “system,” Bates says — that are lower in height than a satellite dish and can be roof-mounted. He hopes to begin assembly and install pilot units in various locations by spring. The goal is to offset a home’s or a business’s energy needs by 10-20 percent with wind power.

“We expect that we will have the lowest cost per watt of any wind device out there, and that’s the key to our business,” Bates says.



The Kentucky River’s Mother Ann Lee Hydroelectric Station.

## Lock 7 Hydro Partners

Renewable energy is to many the Holy Grail for a post-carbon future, and hydropower could well be one of its key contributors in Kentucky, where waterways are abundant and their currents strong. And Louisville-based Lock 7 Hydro Partners is at the forefront, re-harnessing water power at the Mother Ann Lee Hydroelectric Station, a 2,000-kilowatt plant it operates on the Kentucky River.

Named for the location of its first plant, at Lock and Dam 7 near Shakertown, the fledgling company purchased the three generating units in that location that were built in 1927 but retired from service by 1999. Three partners who own 50 percent of the business — David Brown Kinloch, David Coyte and Bob Fairchild — have since March 2006 done their own repairs and retrofits, bringing the first two generators online in 2007 and the final one up to speed in late 2008. The Mother Ann Lee station generated approximately 9.5 million kilowatt hours in 2009, enough to power 1,000 households and replace about 9.5 million pounds of coal if it had been burned to produce the same amount of electricity, according to Kinloch.

Salt River Electric, a cooperative based in Bardstown, owns the other 50 percent of Lock 7 Hydro Partners and purchases the energy it produces at 95 percent of the cost of wholesale-rate coal-generated electricity. “We try to produce it cheaper than coal,” Kinloch says. “We’re not saving the world, but we’re taking a little bite out of (the clean-energy problem).”

Lock 7 came up with its half of the estimated \$2.75-million project cost by borrowing money and selling power and renewable energy credits. The hydroelectric station is one of approximately 30 U.S. hydro projects to receive low-impact certification from the Low Impact Hydropower Institute, an environmental organization that serves as a watchdog over these types of renewable-energy initiatives. Lock 7 Hydro Partners is currently seeking licensing for two more projects that it is designing to generate hydropower at lock and dams 12 and 14 farther upstream on the Kentucky River.

from the heating-air conditioning unit, producing a spreadsheet that acts as a blueprint for change. Rather than recommending a more high-powered central unit or exchanging old windows and doors for new, Roth starts with insulation. “If it’s not insulated, we recommend (insulation) because it’s the biggest bang for the buck,” he says.

Other preferred fixes include repairing leaky ductwork and balancing the airflow through the system, tightening the attic floor and basement foundation to seal an “envelope” of air inside the house, and using multiple thermostats throughout the house tied in to the same HVAC unit to “zone” warmer

and cooler temperatures where appropriate.

Since 70 percent of a household’s energy use goes to heating and cooling the home, Roth encourages big-picture fixes. One option that is gaining steam is geothermal. Roth says this region is a good one for this tactic because the limestone base, which is a good conductor of constant subsurface temperatures, lies close to the topsoil, often within 10 feet or less. This cuts the cost of drilling to install pipes for heat exchange and, combined with current tax credits and the knowledge that utility bills can be cut by approximately 50 percent, makes the investment of \$16,000 to \$18,000 sound more attractive.

