

## State looks to rivers for clean energy

### Kentucky River site is first of several

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PLEASANT HILL, Ky. -- From a small, unassuming plant at Lock and Dam No. 7, not far from historic Shaker Village, the Kentucky River gushes across the propellers of a hydroelectric generator that will soon provide enough electricity for 2,000 homes.

The plant, located under the limestone cliffs of the river as it moves through Mercer County, was built to generate electricity in 1927 for Kentucky Utilities, but became run down and was retired in 1999.

Today, the newly named Mother Ann Lee generating station is one of four new hydropower facilities working or planned in Kentucky -- part of what some see as a step toward meeting the challenges of global warming and an increasing demand for energy security.

"We are at the beginning of a renewable energy revolution," said the plant's co-owner, David Brown Kinloch, a Louisville engineer. "There will be others that follow."

The plant emits no climate-warming pollution, and has been certified as having little environmental impact on the Kentucky River and its aquatic life. It sells its electricity to the Salt River Electric Cooperative, and renewable energy credits to LG&E and Kentucky Utilities.

Even in coal-dominated Kentucky, renewable energy is getting more attention as federal and state tax incentives add up, and the federal government moves closer to capping carbon dioxide emissions and making coal power more costly.

While other states have abundant wind or sunshine, making them good candidates for wind and solar power, Kentucky has substantial and consistent rainfall, and a lot of rivers. Many of the rivers are already dammed for navigation, flood control or recreation, giving the state a potentially rich hydroelectric resource.

Brown Kinloch, who has worked as an energy analyst for past Kentucky attorneys general, said there are potentially dozens more places in Kentucky where existing dams could use water power to generate electricity safely and cleanly.

In addition to the four under way, Brown Kinloch recently conducted a survey showing 20 other potential hydro projects at existing dams that have received preliminary permits from the Army Corps of Engineers or the Kentucky River Authority. Fifteen others also show potential to produce electricity, he said.

The Mother Ann Lee plant is a project of Lock 7 Hydro Partners, which consists of Brown Kinloch, David Coyte of Louisville and Bob Fairchild of Berea, and Salt River Electric Cooperative.

Two of its three units are working; the third should be up soon.

The other projects already under way are at the Cannelton, Smithland and Melhdahl locks and dams on the Ohio River.

Other sites are on rivers such as the Green, Barren and Salt, and include dams that created such lakes as Taylorsville, Buckhorn, Fishtrap and Nolin.

At the same time, LG&E is expanding the generating capacity at a McAlpine Dam power plant.

Challenges remain

Taken together -- 2 megawatts here, 10 megawatts there -- Kentucky has enough lock-and-dam structures or flood-control dams that could be retrofitted to generate as much as 887 megawatts of electricity, according to Brown Kinloch's survey.

That would be, for example, 137 megawatts more than the proposed new unit at E.On U.S's Trimble County plant. And added up, the new hydro potential could power as many as 877,000 homes.

Brown Kinloch's contract with E.On forbids him from disclosing financial details about the Mother Ann Lee plant, and nobody has done an analysis of how much it would cost to retrofit all the dams he surveyed.

But Brown Kinloch estimates the costs of developing the 887 megawatts of hydropower could range from \$1.7 billion to \$4.4 billion. By comparison, The Courier-Journal reported in July that the new 750 megawatt Trimble unit will cost \$1.2 billion.

Some hydro projects, however, could face questions about disturbing water reservoirs, interfering with flood control and slowing navigation. And there are significant engineering challenges for some, said Ken Lamkin, the Louisville-based hydropower coordinator for the Army Corps of Engineers.

"There can be large initial costs," he said. "It just depends on the energy market and whether the long-term profits are there to make that initial cost worth it."

Many of the 14 aging lock-and-dam structures on the Kentucky River cannot structurally support the addition of hydropower generation equipment, said Stephen Reeder, director of the Kentucky River Authority.

The navigational gates at all but one are now permanently closed, and the pools behind them provide local drinking water. Maintaining those supplies remains the first obligation, Lamkin said.

But he added that as the structures are repaired or replaced, hydropower could be added -- if it's determined that it won't interfere with each structure's primary purpose, such as navigation or flood control.

Alternative funding

Brown Kinloch and his partners have done the renovations for the Mother Ann Lee themselves -- and the work often was grueling because access is only by boat or by a 20-minute walk through the woods.

For example, they used a boat, a crane, and ropes to swing a 2,300-pound circuit breaker onto a hillside ledge. When completed, the plant will be able to be run remotely by computer.

During a recent tour of the plant, Brown Kinloch showed how one of the plant's three 20,000-pound rotors, turning 150 times a minute, runs so smoothly that he could balance a nickel on its edge.

"They call that the nickel test," he said, beaming with the pride of a parent.

Some of the work on the Mother Ann Lee is being paid for by some Kentucky Utilities and LG&E customers, through a voluntary "green energy" program.

As part of the program, residential and business customers can pay extra in monthly increments of \$5 and \$13 to support renewable energy and offset their "carbon footprints" -- and a portion of that goes to the Mother Ann Lee plant.

So far, 1,180 customers have signed up, said Chris Whelan of E.ON U.S., the utilities' corporate parent.

Centre College students have voted to assess themselves a \$20 annual surcharge on their tuition to purchase the credits -- a decision approved by college board of trustees on Friday.

The utility's biggest green energy customer is Hosting.com, a Louisville Web hosting services company, which purchased 208 of the business credits for \$2,704 -- enough to offset its warming pollution, Whelan said.

Hosting.com's purchase is the equivalent of removing 304 cars from the road, said Aaron Hollobaugh, a company spokesman.

It's been a successful marketing tool, he said, adding, "We wanted to be stewards of the environment."

#### Legislative outlook

Some states have adopted rules requiring utilities to buy energy from such sources as hydro, wind and solar.

And governments, state and federal, have passed laws giving tax incentives to renewable energy development, including hydro.

Also in play are promises by both presidential candidates to persuade Congress to limit greenhouse gas emissions as early as next year.

Tom FitzGerald, director of the Kentucky Resources Council, said his group plans to urge next year's General Assembly to add incentives to attract capital investment in low-impact hydro, and requirements that utilities operating in the state get some of their power from renewable sources.

Kentucky House Majority Leader Rocky Adkins, D-Sandy Hook, said he will keep encouraging a variety of approaches to broaden the state's energy development.

"We're going to continue to expand our energy policy, not only in renewables like hydro, but in all opportunities," he said.

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