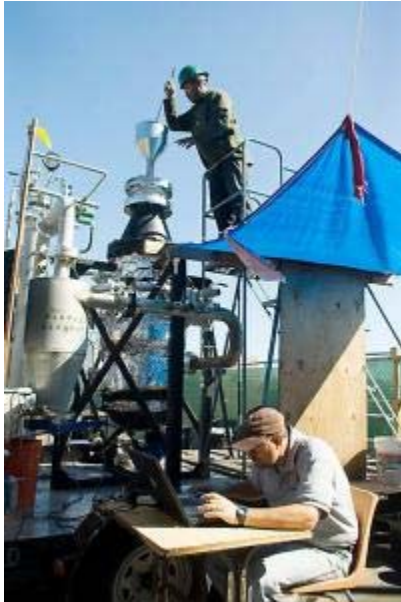


The ADVOCATE

It's a gas: City taps power in its sewer sludge

By Magdalene Perez
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Tom Hair, of Carlin Contracting, foreground, and Nedrick Day, a Carlin mechanic, check the data Tuesday as a team of scientists and consultants participate in the Gasification Research Project in which solid waste is converted into energy. The project is co-funded by the U.S. Department of Energy and the Stamford Water Pollution Control Authority. (Kathleen O'Rourke/Staff photo)

STAMFORD - The big metal contraption, rigged on a flat trailer bed behind the wastewater treatment plant, blasted heat inside a furnace-like core, shot gas through a series of filters, and, like magic, an electrical generator came to life.

It was a milestone for Jeanette Brown and her team of researchers. For the first time in a controlled setting, the group Tuesday converted solid waste from toilets and drains into electricity.

Brown, executive director of the Water Pollution Control Authority, has been working since last year to convert dried wastewater sludge into energy using gasification. Her goal is to build a 10-megawatt power plant on the site that would use gasified organic waste to help meet the city's electrical needs.

Within two months, the team should be ready to begin designing a full-scale power plant, Brown said. If the project secures funding, the plant could be built by 2010.

"I'm really excited," Brown said. "We've been able to verify our original premise, which is that you can take wastewater and convert it to energy without creating pollutants."

The waste could be converted into money, too. City officials plan to use about one megawatt from the plant to power the waste treatment facility. The city would sell the other nine megawatts to the power grid.

That is a fraction of Stamford's energy needs. Stamford's biggest energy user, UBS, consumes about 10 megawatts per hour, Mayor Dannel Malloy said. According to a 2007 report, one megawatt is the amount of power consumed by 700 homes.

Jeff Fournier, a research contractor working on the

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project, said the technology, only pursued in Stamford, could change how cities look at wastewater disposal. Traditionally, cities pay to have wastewater organics hauled away and burned. Stamford has turned away from the conventional method, instead drying waste sludge and selling it as fertilizer.

"We've been able to move sludge from the cost side to the income side," Fournier said. "The question I ask people is, 'If you had a room full of dollar bills, would you burn them?'"

Malloy said it is not yet known how much revenue the plant would raise. The answer partly depends on how much the city invests in building the plant, which is expected to cost millions, Brown said.

Now Brown's team is using a \$1.5 million grant from the U.S. Department of Energy and matched by the city.

Malloy said there may be several ways to pay for the plant, including bonding, federal grants or a private investment that could be paid with revenue from the power generated.

"The obvious goal is to have the revenue from electricity exceed on an annual basis the cost of building the facility," Malloy said.

As unfamiliar as it may be, gasification is not new. The procedure converts organic matter into carbon monoxide and hydrogen by heating it at extreme temperatures. Developed in the 1800s, the British and others used it with wood and coal during World War II to power tractors and other vehicles. It is also the technique underlying "clean coal" technology.



John Walters, a scientist on contract to the WPCA, takes a gas sample Wednesday. (Kathleen O'Rourke/Staff photo)

The Stamford project is unique in the world because it is the first to gasify dried waste sludge for use as power, said Brown, who Tuesday displayed the dried sludge pellets, little gray granules that could be mistaken for cat litter. Her research team uses a machine to heat the pellets as high as 1,000 degrees.

Researchers are trying to find the temperature and amount of moisture that will produce gas with the most energy potential, Brown said. They capture the gas in a sealed bag, then a scientist in the lab measures the contents.

What is left is a grayish ash, only 5 percent of the volume of the original pellets. The ash, primarily carbon and phosphorus, can be used as fertilizer, Brown said. Even gas byproducts, which hung in the air in a smelly unseen haze around the worksite, can be reused, she said.

Brown's team demonstrated another potential use for the gas, which they nicknamed "Stamford biogas." They connected the biogas machine to a Dodge Neon, which revved as the gas was

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combusted in the engine. Fournier said the team plans to outfit a pickup truck that runs on the biogas to promote the project.

Brown said she knew for years that wastewater sludge had the potential to be converted to energy. But only recently, with the increase in cost of other types of energy, was she able to get secure funding for the idea.

A turning point came just before Christmas, when Brown witnessed a test run of the sludge pellets in a wood gasification plant in North Dakota. The pellets supplied 50 kilowatts directly to the North Dakota power grid.

"What a great Christmas gift," Brown said. "It was absolute proof that we could do it."

She would like to show the world that gasification is a clean and effective alternative to fossil fuels. If all the wastewater treatment plants in the United States gasified their waste, the output could power 2 million households per day, she said.

"We're hoping that it's so successful that this becomes the norm at wastewater treatment plants," Brown said.

Jeff McIntire-Strasburg, an environmentalist blogger for Sustainablog, said there may be more money for cities to explore waste gasification when the Bush administration leaves office. h Obama and McCain support agreements that could make carbon-reducing measures more lucrative. Obama has pledged to commit \$15 billion per year for 10 years to renewable energy sources.

"Every city has sewage, so it's hard to see how this wouldn't catch on on some level," McIntire-Strasburg said.

Fournier said use of gasification will increase in the next five years.

"This is really on the cutting edge," Fournier said.

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