

## Power from poop? It's on its way

Human waste could become N.C.'s top green fuel for electricity plants.

By John Murawski

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It's foul and untouchable, but also packed with energy and endless in supply.

Human waste may well become North Carolina's leading animal source of green fuel for generating electricity.

A wastewater-treatment plant in Cabarrus County expects to start burning processed human excrement as early as next year to generate electricity. A project in Mecklenburg County has plans to turn waste to energy, and others across the state are expected to follow as the state continues adopting clean energy alternatives.

The N.C. Utilities Commission **opened the door to tapping our energy-rich human byproduct by declaring human waste to be every bit as green as solar, wind and hydroelectric power. The ruling in February gives electric utilities the go-ahead to pay a premium price for this resource, which utilities can count toward meeting their state mandates for renewable energy.**

"All responsible water utilities are contemplating this as part of their future planning," said Robert Rubin, a retired N.C. State University professor of biological and agricultural engineering. "We are looking at these societal byproducts as a resource."

The proposed ReVenture Park, an "eco-industrial" project in western Mecklenburg, includes plans to turn sewage wastes into energy. The project, which is still under development, would turn byproducts of sewage treatment called "biosolids" into energy.

It is estimated that today fewer than two dozen wastewater treatment plants around the country - none in North Carolina - currently convert human waste to electricity.

**Manmade fuel's energy**

Advocates say power generation at wastewater-treatment plants builds on accepted and safe methods of elimination: burning the waste or decomposing it with bacteria. The energy content of the man-made fuel is comparable to that of wood, Rubin said.

Even so, converting human waste into fuel could draw unwanted attention to the raw material involved and run afoul of cultural taboos in some communities.

"Most people out there will tell you, you don't play with poop," said Rubin, who has studied human biosolids for about 35 years. "Waste treatment is a very emotional issue."

The Water and Sewer Authority of Cabarrus County has been incinerating human waste for years. Officials recently concluded it made economic sense to capture the heat exhaust to power a small turbine and run a generator.

### **Turning heat to power**

Their mini power plant, expected to be operating by late 2011 or early 2012, will generate 1.5 megawatts of power, about three-fourths of the authority's electricity needs. Retrofitting the incineration system will cost about \$10 million and will produce \$2 million a year in electricity, Cabarrus officials estimate.

The source of fuel: roughly 300,000 North Carolina residents. Half of these fuel producers are served by the Cabarrus water authority; the rest of the fuel will come from neighboring wastewater-treatment plants that pay Cabarrus to dispose of their waste.

"The sludge is being transported right now to either be land-applied (as fertilizer), which does smell, by the way, or to some sort of landfill," said Jennifer Bell, an engineering consultant for Cabarrus County. "Human waste has been a liability for decades and decades."

In North Carolina, only four wastewater-treatment agencies use incineration to eliminate human waste - in Concord, Greensboro, High Point and Asheville. It's not clear whether any more waste incinerators will be built in this country. Aside from the controversy inherent in incinerating feces, this month the U.S. Environmental Protection Agency proposed much stricter pollution controls for the nation's 218 wastewater-sludge incinerators.

The nation's only public hearing on the new rules will be at the EPA's office in Research Triangle Park on Nov.29.

## **Making methane**

Most wastewater treatment plants in the country break down human waste using bacteria. One of the bacterial processes, anaerobic digestion, creates a valuable byproduct: methane, a gas that that can be used to run electric generators.

Durham's Department of Water Management has been using anaerobic digesters for more than six decades. Durham burns the methane gas for industrial applications within the agency.

The department is considering the costs and benefits of other energy reuse options, including the use of methane to generate electricity, said assistant director Vicki Westbrook. Durham is still in the initial stages of its study and will assess the options next year.

Staff writer Bruce Henderson contributed.