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Pig waste proves powerful

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YADKINVILLE The old saw about using every part of a pig but the squeal now includes its droppings, which are producing electricity on a Yadkin County farm.

Duke University is a partner with Duke Energy and Google in testing a system that captures methane, a potent greenhouse gas, from manure. The gas fuels a small power plant that makes enough energy to run the waste-processing system and part of the farm itself.

Loyd Ray Farms joins a handful of North Carolina hog farms that have become energy innovators. They're prompted by state laws aimed at boosting renewable energy and phasing out open waste pits that can taint water and release harmful ammonia into the air.

"I was kind of curious myself how it was going to do," said farm owner Loyd Bryant, who at 71 is part of the old guard. Bryant first raised hogs in the 1960s. More than 8,600 now fatten up in his row of barns.

"There will be a few more records to keep, but it's not going to be no big thing," he said. "And it might bring my power bill down."

The powerful troika collaborating on the project will also benefit. The university and Google, which owns a data center in Lenoir, score credits to offset their carbon emissions. Duke Energy gets help in meeting a state mandate that, starting in 2012, utilities make electricity from swine waste.

The university and the utility also hope for insights in how to make such innovations more affordable - the Loyd Ray project cost \$1.2 million - and fit them into a slowly expanding menu of energy choices.

"This is a learning opportunity for us to get it on the ground, refine it and understand the benefits and the costs," said Tatjana Vujic, director of Duke University's Carbon Offsets Initiative. With the experience already gained, and use of off-the-shelf parts, Duke researchers believe they could build a similar system now for substantially less.

Beginning next year, North Carolina utilities have to get 0.07 percent of their electricity from hog waste. The figure rises to 0.20 percent by 2018. State law includes a similar requirement for poultry waste.

Learning how it works

The renewable energy credits that Duke Energy will reap from the Yadkin County farm will only partly meet its obligation in 2012, company spokesman Jason Walls said. Hitting the state's swine- and poultry-waste targets will be a challenge, he said.

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"It's really driven by the immaturity of that market and technology," Walls said. "The real value for us at Loyd Ray Farms is that it helps us learn how this technology works with our system, how reliable it can be. We're really approaching this as a research project."

After three years of work, the new project is up and running. Dignitaries will attend an open house on Friday.

They'll find a newly equipped swine farm that, although it opened in 1998, is now able to meet the state standards for odor, ammonia, nutrients, pathogens and metals that would be demanded of a new farm.

Bryant, like most hog farmers, previously sprayed effluent from an open waste lagoon onto fields of grass and millet to absorb its heavy load of nutrients. The new system will let him return the spray area to growing corn and other crops.

Grants from the federal Natural Resources Conservation Service and North Carolina's lagoon-conversion program paid \$500,000 toward the project. Duke Energy and Duke University picked up the other construction costs and operating costs for 10 years. Google bought in last month, agreeing to help pay the university's costs for five years in return for a share of carbon offsets.

The project builds on research into lagoon alternatives that began in 2000, after large waste spills focused attention on the lagoons' environmental costs. In 2007, state legislators adopted standards to begin shifting toward alternatives to open waste pits and spraying.

North Carolina remains a leading hog-producing state, with more than 2,100 permitted farms raising 9.4 million animals a year.

Loyd Ray's is the first system using an anaerobic digester, which decomposes waste, to be permitted by the N.C. Division of Water Quality as an innovative animal-waste management system. It uses readily obtainable parts but in unique designs by Wilmington-based Cavanaugh & Associates.

It's expected to capture methane - a greenhouse gas 21 times more potent than carbon dioxide - that is the equivalent of nearly 5,000 metric tons of CO