Methane to energy niche grows

More waste being turned into energy at state landfills, waste-water plants

By Nathaniel Cary
STAFF WRITER
ncary@greenvillenews.com

Three red flues topped with black caps stand like guards at Renewable Water Resources' Mauldin Road waste-water treatment plant spitting fire every few seconds to incinerate methane gas before it escapes to do environmental mischief.

The flues and their flaming belches reduce the amount of methane leaked into the atmosphere but also destroy what has become a valuable alternative energy source that ReWa hopes to exploit.

The driving forces behind the move to develop alternative energy sources locally and nationwide are many, including costs, climate change, health and environment impact from fossil-based fuels and national security concerns over U.S. dependency on foreign oil.

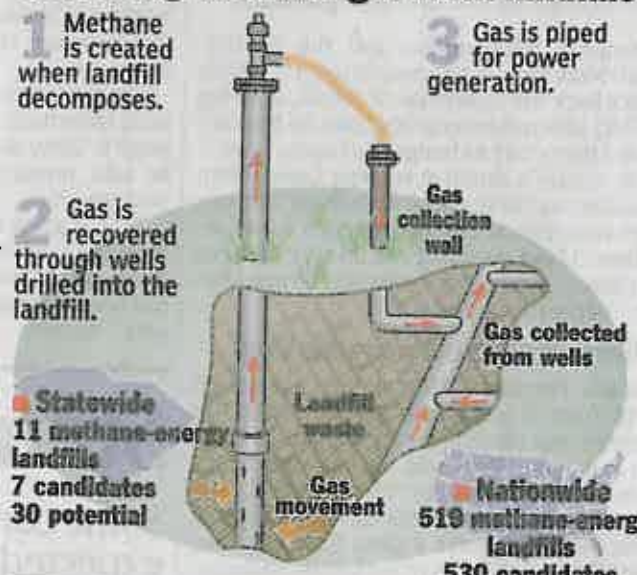
When garbage decomposes, it produces a gas that is half methane, which can escape into the atmosphere and create 20 times the harm caused by carbon dioxide, according to the Environmental Protection Agency.

The EPA estimated that methane-to-energy projects removed toxic greenhouse gases from the atmosphere equal to those produced by 15.7 million vehicles.

U.S. Sen. Lindsey Graham and U.S. Rep. Bob In-

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Capturing methane gas from landfills



Sources: EPA, Waste Management

SUZIE RIDDLE / Staff

GAS

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glis say developing alternative energy is a matter of national security. Military leaders and an independent task force commissioned by the Council on Foreign Relations found that as an energy consumer, the U.S. is increasingly vulnerable in its foreign policy and national security objectives.

Companies like BMW have proven that methane gas from decomposing trash converted to electricity can sustain giant operations and improve air quality. BMW satisfies more than 60 percent of its energy needs with methane gas tapped from nearby Palmetto Landfill.

ReWa, formerly known as Western Carolina Regional Sewer Authority, will spend $2 million to $2.5 million to install generators at its Mauldin Road and Pelham Road waste-water treatment plants that will turn methane gas into usable energy, which ReWa will sell to Duke Energy.

ReWa is joining a handful of methane gas-to-energy projects taking shape across the state.

Santee Cooper, a state leader in landfill methane-to-energy projects, opened one of its six sites at the Anderson Regional Landfill in 2008 and produces enough energy to power 11,000 homes, Santee spokeswoman Molly Gore said.

Landfill methane projects already produce enough energy to power 889,000 homes nationwide. Landfills that are good candidates for methane energy could generate electricity to power another 720,000 homes, according to the EPA's Landfill Methane Outreach Program.

Of 2,300 operational or recently closed landfills, 519 have landfill gas projects, while another 530 produce enough gas to make them good candidates for methane-to-energy projects, according to the EPA.

Methane-to-energy projects have gained national approval through the federal stimulus package, which sent $2.82 million to South Carolina for alternative energy development.

ReWa received $500,000 in stimulus money to install the co-generators, which are expected to save $155,000 a year or $3.8 million over the course of the equipment's lifespan, said Erika Myers, manager of energy operations with the state Office of Energy, which distributed the stimulus money.

ReWa's project signals a new phase in methane-to-energy. For years, landfill gas took the forefront in the state's methane-to-energy development and only recently have waste-water treatment plants started to study the gas as a possible energy source, Myers said.

"It would ultimately reduce the cost for taxpayers by creating another income stream for the waste-water treatment facility," Myers said. "Hopefully it will not only produce renewable energy, which is good for the environment, but also save taxpayers money."

Ray Orvin, ReWa's executive director, said it could see a $250,000 a year return on its investment, which would allow the agency to fund projects or minimize rate increases.

ReWa's latest strategic plan spawned the idea for its methane project, Orvin said.

"These products have uses," he said. "We don't need to be burning it off."

Myers has seen increased interest from some of the state's larger

waste-water treatment plant operators and from landfill operators who traditionally have burned off methane.

The EPA lists 11 operational landfill projects statewide, seven landfills as candidates for landfill gas projects and another 30 as potential sites.

Still, it's a relatively small amount of energy produced considering South Carolina imports 98 percent of its energy, according to a 2006 State Office of Energy report that studied the viability of methane as an energy source.

"It's growing," said Gore, Santee Cooper's spokeswoman. "It still is a small part of what we do in terms of total capacity."

Petroleum leads the way in nationwide energy consumption at 37 percent. Natural gas follows at 24 percent, coal at 23 percent, nuclear electric power at 9 percent and renewable energy at 7 percent, according to 2008 figures released by the Energy Information Administration.

Biomass, which includes the use of methane but also wood and wood waste turned into energy, produces 53 percent of that renewable energy with the rest produced by hydropower, wind, geothermal and solar.

Santee Cooper plans to add capacity to its landfill methane program this year by opening a new site in Berkeley County and adding capacity at its Richland County site, Gore said. She called it a "cost effective" renewable energy solution that's produced "dramatic" growth in that one energy sector.

With a finite number of landfills in the state and even fewer that are large enough to generate methane gas for an energy

project, it's not the only long-term energy solution, Gore said. Santee Cooper is studying a variety of concepts, from biomass energy produced through controlled brush burns to wind energy off the South Carolina coastline.

Life spans of landfill methane-to-energy projects are limited to the number of years garbage decomposes in a landfill.

That's led companies like BMW, which has a contract through 2020 to tap methane from the Palmetto Landfill, to begin planning for the giant manufacturing plant's next steps in renewable energy, said Max Metcalf, BMW's manager of government and community relations.

Landfill methane projects don't come without obstacles. Most cost millions of dollars, which make projects at smaller landfills unreasonable. And some environmental groups, such as the Sierra Club, maintain that they aren't renewable because the trash isn't renewable.

"They would support new projects like that if they absolutely take out every bit of organic material from the waste stream," said Peggy Brown, conservation chairwoman for the state chapter of the Sierra Club.

Instead the club promotes wind and solar projects but stresses increased energy efficiency as the top goal, Brown said.

Still, the waste is there and power companies are showing willingness to spend millions to capture energy from it, said Myers, with the Office of Energy.

It's becoming more of a benefit to waste-water treatment facilities like ReWa to study the capital costs as landfills reach capacity and tipping fees rise, Myers said.

"In many cases it's really the only alternative to dispose of the waste," she said.



BMW Manufacturing gets more than 60 percent of its energy from methane gas from the Palmetto Landfill.

Staff