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Tapping landfill's energy potential

S.C. Johnson hopes to transform gases into electricity for plant

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Mount Pleasant - S.C. Johnson & Son's Waxdale plant here will take energy essentially from "landfill to light bulb" with a \$5 million system that will create electricity and steam from landfill gas while reducing the firm's dependency on electricity and natural gas by 50%.

While there are 340 landfill gas projects in the country, only about 30 companies using methane also have some system that uses the otherwise wasted heat generated from burning the methane for another good use, the U.S. Environmental Protection Agency said.

"This is unique," said Chris Voell, program manager of the EPA's landfill methane outreach program, of S.C. Johnson's plan. Voell said none of the heat recovery systems is as sophisticated as the plan by S.C. Johnson, a global manufacturer of household cleaning and personal care products.

Taking the concept a step further by using the methane gas to make electricity and recovering waste heat for use in the plant as steam makes the plan "even more unique," Voell said.

Voell said the BMW plant in South Carolina is looking at a methane and heat recovery process that could be online by the end of the year. Other companies interested in such procedures include General Motors, DaimlerChrysler, Nestle, Honeywell, International Paper and Cargill, Voell said.

Landfill Project



Photo/[Jack Orton](#)

Frank Ericson (left), environmental operations manager for S.C. Johnson, and Scott Johnson, the firm's vice president of global and environmental safety actions, hope to use the methane gas that they have been tapping in a Mount Pleasant landfill to create electricity and steam for the firm's nearby Waxdale plant.

Energy System

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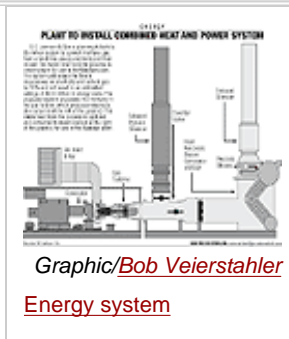
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As waste decomposes in a landfill, gases are produced. About 50% is methane gas, and 50% is carbon dioxide, along with trace amounts of other gases, like nitrogen, and organic compounds. The methane, once captured as it is at the Mount Pleasant landfill, can either be burned off into the atmosphere or used as a replacement for fossil fuels.



The Waxdale plant system will use an industrial turbine engine for the combustion of the methane gas from the landfill to make 3,200 kilowatts per hour of electricity and then will recover the waste heat from the exhaust to make 17,000 pounds of steam per hour or 17 million BTUs per hour, which is close to the plant's steam needs for all of a typical summer. The steam will be used for various processes and for heat at the Waxdale plant.

"This system captures as much heat as we can from an engineering point of view," said Frank Ericson, environmental operations manager for S.C. Johnson.

Once operating, the system will account for a third of the power used at Waxdale, which for S.C. Johnson means a cut in the consumption of electricity and natural gas by 50%, and a reduction of greenhouse gas emissions at the plant by 30,000 tons per year, or 50%.

Construction of the system and the small building to house it could begin next month and is expected to be up and running by Dec. 1. The project is still awaiting permits from both the Town of Mount Pleasant and the state Department of Natural Resources.

It will cost the company \$200,000 to \$300,000 a year to purchase the methane gas; the company anticipates a \$2.4 million annual saving in energy costs.

The company has been piping methane gas to the plant through a pipeline two-thirds of a mile long from a nearby landfill operated by Republic Industries to operate its boilers for the past 15 years.

About two years ago, the company started to look more closely at reducing greenhouse gas emissions. That work got a boost in February 2002 when the Bush administration announced the formation of Climate Leaders, a voluntary program that encouraged companies to develop long-term climate change strategies aimed at reducing greenhouse gases.

Joining in

Miller Brewing Co. in Milwaukee and General Motors were the first two companies to join Climate Leaders; S.C. Johnson was the third.

"We began looking at projects that would no longer be merely energy efficient but that would also have an impact on greenhouse gases," said Scott Johnson, vice president of global and environmental safety actions for S.C. Johnson.

In late summer, the company announced its target to reduce overall greenhouse gas emissions by 23% per pound of production, or an absolute reduction of 8%, by 2005.

"It's an aggressive target," said Cynthia Cummis, manager of the EPA's Climate Leaders program. "I believe their commitment to this project is because they believe this is the right thing to do. That is really a demonstration of leadership."

Ericson said several green energy projects were evaluated - fuel cells, solar power and even planting trees.

Gas goal

The idea of making renewable energy by using landfill gas to make electricity and steam showed the greatest promise toward meeting its goal of reducing greenhouse gases, Ericson said.

Johnson said the company found out how unusual the system was while trying to research its options.

"We've been researching where to get the expertise for the project, and we haven't run into anyone who is doing this," Johnson said.

S.C. Johnson also is working on other projects at its other worldwide operations to address greenhouse gas emissions, Ericson said. In the Netherlands, for example, windmills will be used to reduce fossil fuel use.

Honor for company

S.C. Johnson's commitment to sustainable and green practices was recognized last week in Milwaukee when the firm was one of seven recipients of the Governor's Award at the conference of the Federation of Environmental Technologists.

"It really is rewarding to be able to do something positive - create energy - from something that seems to be so negative - a landfill," Johnson said. "Hopefully, this will encourage other companies to do the same thing."

A version of this story appeared in the Milwaukee Journal Sentinel on March 9, 2003.

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