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**BREAKING**

# Dane County begins turning gas from landfill's trash into vehicle fuel

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Robert Kinzler, a design engineer with BIOFerm Energy Systems, describes the process of removing carbon dioxide and other excess materials from natural gas sourced at the Dane County Landfill. Compression is used to extract the carbon dioxide, which then goes into the two large, spherical bladders. The county must clean the gas before it can be sold as vehicle fuel.

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Trash thrown away by Dane County residents will now help reduce greenhouse gas emissions as the county begins turning the gas released from decomposing garbage into transportation fuel.

The county had long been trapping the methane and other gases emitted from the heaps of garbage at the landfill to be used for electricity, but the county is now using that resource to create and sell compressed natural gas (CNG), a more eco-friendly vehicle fuel than gasoline and diesel.

As representatives of the county, contractor BioFerm Energy Systems and CNG seller Kwik Trip cut a ribbon Thursday at the gas-processing facility at 7102 Highway 12-18, compressors gasped and groaned as machines cleaned the massive amounts of gas being produced and compressed the resulting methane to be injected into an interstate pipeline owned by ANR Pipeline Company.

“You know that banana peel someone threw out six months ago and rotted? The gas from that banana peel is being cleaned and put in the pipeline and fueling vehicles,” County Executive Joe Parisi said.

The county decided to utilize and monetize the gas coming from the landfill as a contract with Madison Gas & Electric came to an end. Because electricity from wind and solar power has become cheaper, it no longer made economic sense to continue selling the gas for electricity, Parisi said.




BIOFerm Energy Systems President Nadeem Afghan, center, joins County Executive Joe Parisi, right, to describe the natural gas processing plant that will clean and compress gas emissions at the county landfill to be used as vehicle fuel.

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“We’ve come up with a way to not only bring more dollars into the county coffers from our renewable gas, but also to even further reduce greenhouse gas emissions,” Parisi said.

CNG has been used in vehicles for about 30 years, UW-Madison mechanical engineering professor Glenn Bower said. The methane in natural gas is a very harmful greenhouse gas when emitted, but when it’s burned in vehicles, it changes into a less harmful carbon dioxide and is considered a cleaner fuel source than gasoline.

 Kwik Trip continues to build its compressed natural gas network

About 30% of the county’s fleet is running on CNG, Parisi said. Kwik Trip’s Joel Fasnacht said about 85% of Kwik Trip’s fleet uses CNG.

Natural gas that is sourced from the ground has a higher ratio of methane than the gas sourced from the landfill, which Bower said had made it a difficult source for use in vehicles. Unless a vehicle is equipped with sensors that can accurately detect methane concentration, the vehicle may not use the proper amount of fuel compared to the oxygen intake.

BIOFerm’s facility overcomes that challenge of gas sourced from landfills by constructing several cleaning steps to reach a higher concentration of methane. Various chemicals and particles are stripped away from the gas as it passes through several massive tanks — some up to 60 feet tall — before it is injected into the pipeline, president and CEO Nadeem Afghan said.

ANR has sensors that monitor the gas quality as it enters the pipeline, so if the CNG doesn’t meet the quality standard, the valve to the pipeline will be shut.





To protect both equipment and workers, the facility includes multiple fail-safes that can shut down parts of the process, county Department of Waste and Renewables director John Welch said. Workers have access to controls that monitor and manage the cleaning and compressing process.

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The other particles removed from the gas are burned away and disposed of — a requirement from the Environmental Protection Agency — but the county hopes to find ways to harness the other compounds in the landfill’s gas, said John Welch, director of the county Department of Waste and Renewables. One potential option would be trapping the excess carbon dioxide and turning it into dry ice.

“Long term, our goal is to have zero emissions” from the landfill, Welch said.

The facility is expected to offset about 3 million gallons a year of gasoline that otherwise would have been used, Parisi said, and that number could grow to 4 million in future years. That would be like taking 4,800 cars off the road.

 Dane County partnering with MGE on huge solar project at airport

The facility itself isn't running on green energy yet, but it will use power from a large solar panel array set to be installed at the Dane County Regional Airport once that project goes online.

## Other suppliers

The facility also includes an injection station for other CNG suppliers, such as manure digesters, to access the interstate pipeline. The county hopes local manure digesters will upgrade their facilities to conduct the same cleaning process of the gas, which would then be shipped to the landfill. The digesters wouldn't otherwise be able to secure access to a pipeline because the existing line does not run near them, and the cost of creating an injection point would be prohibitive.

"They'll be able to sell the gas and get renewable energy credits for it," Parisi said. "This makes our manure digesters much more economically viable."

Dane County's facility at the landfill is only a few thousand feet from the existing pipeline.

The county will not clean the gas that is brought to the landfill, and any natural gas brought to the facility that doesn't meet the ANR standard will instead be burned. Digesters or other natural gas suppliers will have to have their own processing facilities to ensure quality.

Afghan said this is likely one of the first facilities of its kind in the nation, in part because of the investment cost by the county. The county spent \$29 million to build the facility, which had been included in the 2018 budget, but Parisi said the county expects the facility will pay for itself in four years.