WASTE MANAGEMENT

# LANDFILL GAS

## A RELIABLE, RENEWABLE ENERGY SOURCE

Waste Management has been actively developing landfill gas-to-energy projects for more than 15 years. Once viewed as an environmental concern, landfill gas is now a safe, economical and viable "green power" alternative to other fuels.

Landfill gas is produced through the natural breakdown of waste deposited in a landfill. The gas, which would otherwise be wasted, is a readily available, renewable energy source that can be gathered and used directly as medium Btu gas for industrial use or can be sold to gas-to-energy plants to fuel engine generators, which, in turn, generate electricity. Several Waste Management landfills have been recognized by the Environmental Protection Agency (EPA) for innovation in landfill gas recovery.

Waste Management currently supplies landfill gas to 69 gas-to-energy projects in 21 states. In all, the gas-to-electricity projects provide more than 185 megawatts of energy, enough to power 160,000 homes. Over the years, Waste Management's commitment to capturing and using landfill gas has helped reduce greenhouse gas emissions from its landfills by 50 percent. Primarily as a result of its methane gas recovery projects, it has become one of the largest private holders of greenhouse gas emissions reduction credits in the U.S.

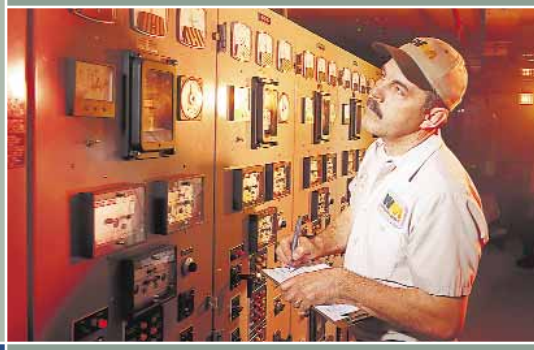
As a leading provider of comprehensive waste management services, Waste Management views landfill gas projects as another step in the environmentally sound management of municipal solid waste. The company has successfully permitted, designed, built and operated both medium Btu gas plants and gas-to-energy systems throughout the U.S. Its gas-to-energy projects continue to earn numerous awards and national recognition.

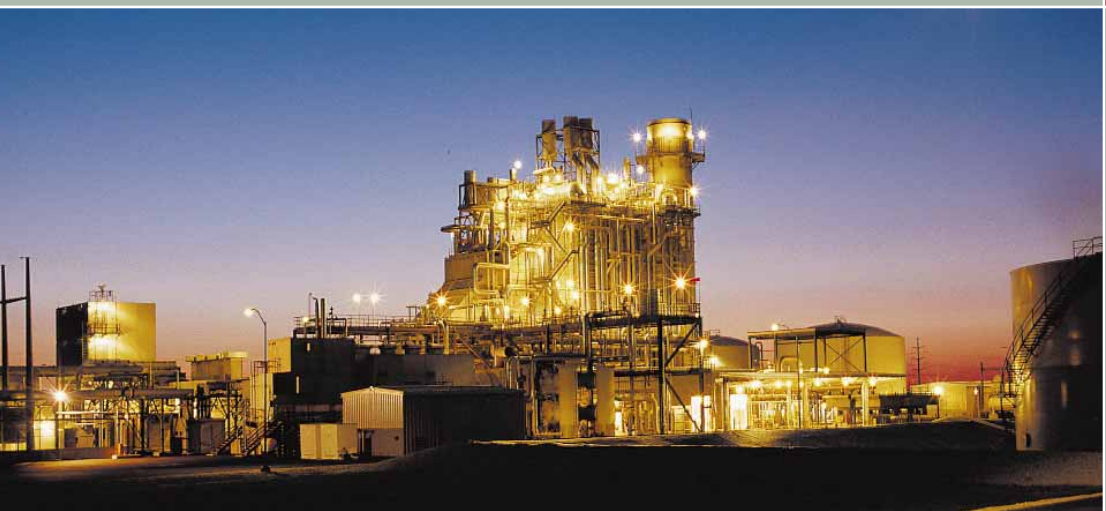
- In 2001, EPA Administrator Christie Whitman visited Waste Management's landfill gas-to-energy project in Atlanta and commended the company's "innovation and partnership" in meeting the energy needs of the 21st Century.
- In 2002, the company donated all of the 120,000 metric tons of carbon dioxide equivalent emission reduction credits needed to offset additional CO2 emissions anticipated from the 2002 Olympic Winter Games. The donation of the emissions reduction credits helped create the first games in Olympic history to have a net zero effect on the air quality of a host city.
- Waste Management was named the EPA's 1999 Landfill Methane Outreach Program Industry Ally of the Year, honored for its outstanding efforts to promote landfill gas-to-energy projects.
- In Pennsylvania, WM's Grand Central Sanitary Landfill received the 2000 "Project of the Year" award from the EPA's Landfill Methane Outreach Program for its landfill gas-to-energy project.
- In 2000, Waste Management announced an agreement with Reliant Energy, based in Houston, Texas, to develop 11 landfill gas-to-electricity projects in Texas. The project is the largest of its kind for the company and could increase WM's renewable energy production by 20 percent over the next several years.

Landfill gas is a viable, alternative energy resource that is meeting the power needs of many industries and communities in North America. Waste Management is committed to being an industry leader in the best use of all of our natural resources, including landfill gas.

### THE BENEFITS OF LANDFILL GAS

Landfill gas is a readily available, renewable energy source that offsets the need for non-renewable resources such as coal and oil. Landfill gas can be converted and used directly by industrial plants to fuel boilers and furnaces or to power turbines that generate electricity. It can also be converted to liquefied natural gas for use as an alternative fuel for vehicles. Of the 6,000 landfills in the U.S., about 325 energy projects currently convert methane to an energy resource. The EPA estimates that as many as 500 additional landfills could cost-effectively turn methane into an energy resource, producing enough electricity to power 1 million homes, the equivalent of removing the greenhouse gas emissions that would be generated in a year by 13 million cars.



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# NEBRASKA'S FIRST LANDFILL GAS-TO-ENERGY PROJECT BEGINS OPERATION AT DOUGLAS COUNTY RECYCLING AND DISPOSAL FACILITY

WASTE MANAGEMENT

Waste Management and the Omaha Public Power District are working to turn waste into watts with a new methane gas plant at Douglas County Recycling and Disposal Facility. The $4 million, 3.2-megawatt power plant is fueled by methane gas produced by the Douglas County Landfill, where the plant is sited.

The cooperative project calls for Waste Management to lease three acres of land to Omaha Public Power District (OPPD) and build a generating plant to burn the gas. OPPD will pay Waste Management for the gas and for building, operating and maintaining the plant. In turn, OPPD will offer its customers the opportunity to buy some of the renewable energy at a slight premium.

The plant is the largest renewable energy plant in Nebraska, the first landfill gas to energy operation in the state and one of OPPD's first ventures into "green energy."

The new gas-to-energy plant is expected to produce 25.3 million kilowatt hours of "green power" per year or enough electricity for more than 2,000 homes. Over time, the landfill size and landfill gas supply should increase, thus increasing the potential generation of power.

Douglas County Recycling and Disposal Facility currently has 27 wells made of perforated plastic pipe collecting gas from the landfill. More pipes connect the wells, and a blower vacuums out gas at a rate of 1,100 cubic feet a minute. The gas is delivered to the new OPPD-built generating plant, where it fires engines and drives a turbine. The gas will be used as fuel to power four 800-kilowatt internal combustion engine/generator sets, which produce electricity.

Waste Management also has received state approval to build a new, larger landfill adjacent to the current Douglas County landfill, which opened in 1989. The new landfill is estimated to open in July 2003 and could be a source for additional landfill gas recovery.

**Douglas County Recycling and Disposal Facility**
14320 N. 216th Street
Bennington, Nebraska 68007
(402) 478-5196

## HOW LANDFILL GAS IS RECOVERED

The process begins with the disposal of organic-rich solid waste into sanitary landfills. As the waste decomposes, methane gas is produced. This gas is recovered by a series of wells that are drilled into the landfill. The wells are interconnected by a common collection system that transports the gas to a compression facility. There, the gas is compressed, dried and filtered before being sent through turbines or engines to produce electricity. Alternatively, for direct-use applications, landfill gas is delivered off-site to industrial customers and used as an alternative fuel source. Waste Management is also working on the conversion of landfill gas into liquefied natural gas to use as fuel for its own trucks.

## LANDFILL GAS TO ENERGY