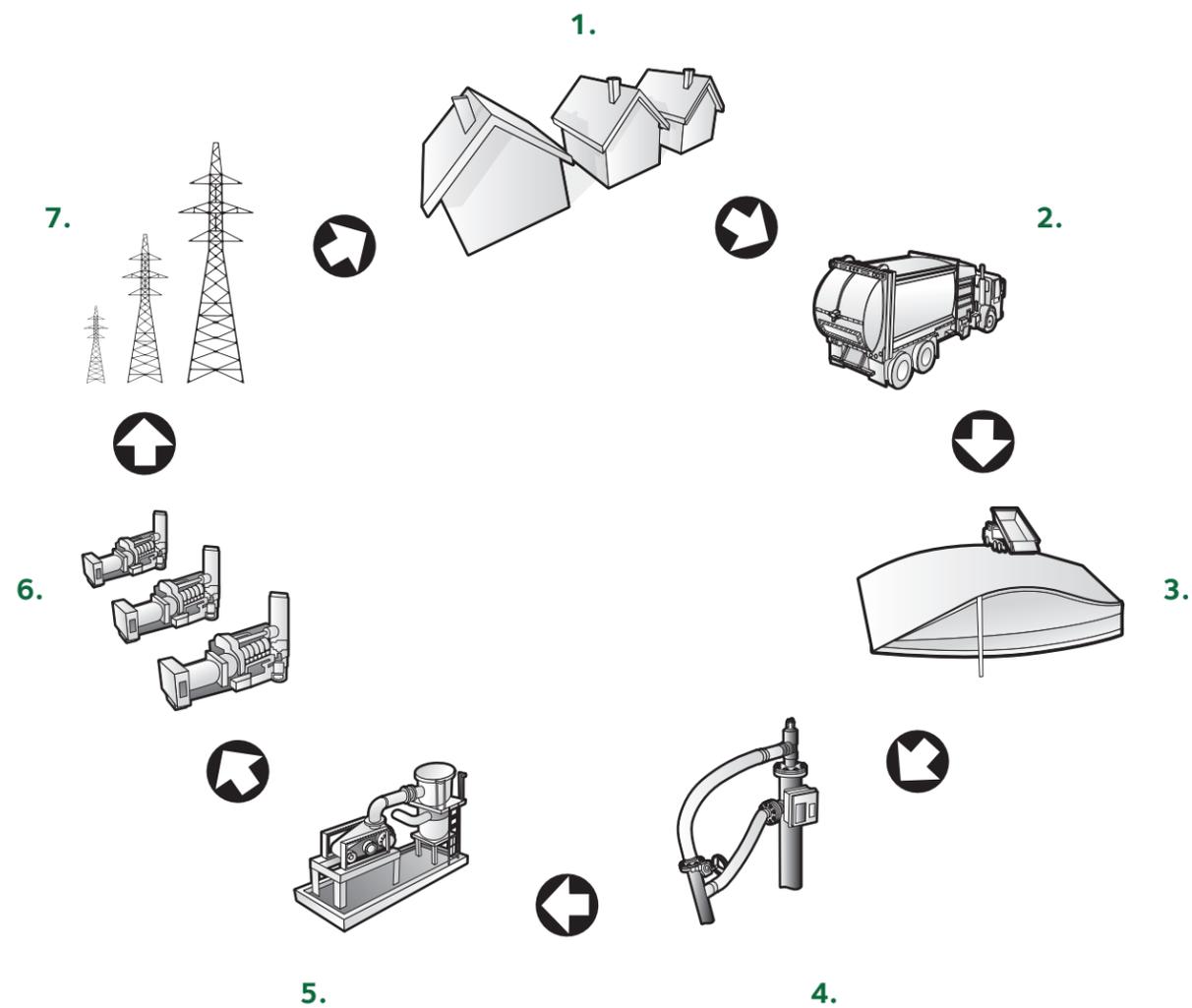




The Sustainable Energy Plant.



How landfill-gas-to-energy works

- 1.** Creating energy from landfill gas begins with collection. When taking into account homes, restaurants, construction sites, schools and all kinds of businesses, the average person generates over four pounds of trash daily.
- 2.** A collection truck can typical hold over 10 tons. Later on in this brochure, read how our Altamont Landfill in California is using its gas to power our fleet.
- 3.** As waste enters a landfill, it decomposes, creating a gas. When captured, this gas can be used for a number of applications. To produce electricity, the process we use is called *landfill-gas-to-energy*.
- 4.** Gas is collected through wells placed all along the landfill. These wells work on a vacuum and actually draw the gas through the entire process.
- 5.** Once out of the landfill, we first filter the gas to take out any liquids or small pieces of debris that came up in the vacuum. Next, the gas is compressed until it can be used as a fuel. We then chill the gas, using condensation as a way of separating any remaining liquids. Lastly, we filter the gas a second time and then it's ready for use. The whole process takes seconds.
- 6.** Landfill gas can either be piped away to a customer's power plant, or simply brought to a plant located at the landfill. In either case, the gas is used to power an electrical generator, turbine or engine. When you think of these machines, they really are not that different from the engine powering your car. They operate on pistons, air filters, radiators, batteries, and so on.
- 7.** Energy from these generators is sent to a utility grid, which then transfers the power for residential and business use. Think of this whole process as a circle – it starts at your home and ends at your light switch. That's closing the loop for our environment.



Green Campus

Renewable energy facility at the University of New Hampshire.



Power on

Landfill gas is a renewable source of energy.

Meeting demand with landfill power.

Communities are built with the energy we create. As North America scrutinizes its dependence on fossil fuels, Waste Management is producing electricity using the discarded materials we collect every day. How much? Currently, Waste Management generates more power than the entire solar industry in the U.S. and more than half the amount of energy created through geothermal sources.

We do this two ways: by recovering energy through controlled combustion at our waste-to-energy plants and through landfill-gas-to-energy, which is detailed in this brochure.

At many of our landfills, we have constructed power plants that convert gas produced during waste decomposition into a fuel that can be used to create electricity. We've been developing these plants for the past two decades, and today more than 120 of our sites are using this technology. By 2013, we plan to have over 160 projects in operation, creating 700 megawatts of electricity. While it can be difficult to illustrate just how much energy that really is, imagine if by recycling landfill gas we could reduce our dependence on foreign oil by 8 million barrels every year. That's making a difference.

A Reusable Product.

Waste is made everyday, whether it's food from the kitchen or leaves from the lawn. Sometimes waste can be recycled and sometimes it cannot. Sometimes it is taken to a landfill where it becomes a material we can use to create energy. In fact, landfill gas has a variety of applications:

1. Electricity – generating electricity at power plants located either at our landfill or at a nearby business.
2. Alternative Fuel – piping it to customers for use as a heating fuel to supplement (or replace) oil, coal and natural gas.
3. Processed Gas – cleaning and delivering it to transmission pipelines to perform the same applications as natural gas.

Sustainable energy that makes economic sense.

Even though the electricity we create is a product of waste, the U.S. Environmental Protection Agency has endorsed the use of landfill gas as a clean energy alternative. When compared to fossil fuels, like coal and oil, as well as other renewable sources of energy, like wind and solar, landfill gas has several perks:

- It reduces greenhouse gas emissions
- It maintains a stable price
- Its energy output is constant and not dependent on sunlight, wind or other environmental variables
- It is predictable during peak hours with availability exceeding 95 percent

Over the years, we have helped customers take advantage of this energy resource, providing an alternative that is both good for their bottom-line and environment. In fact, the dependability and financial benefits of landfill gas have been credited with keeping at least one of our customers in operation (see case studies).

Third Party Service Offering.

With landfill power becoming a proven source of energy, communities and businesses across North America are striving to make this resource a part of their own energy strategy. To help them achieve their goals, Waste Management offers third-party energy consulting that supports local governments and businesses cultivate their own projects. This may include constructing an energy plant at a municipal or privately owned landfill, marketing the energy to a utility, or even operating the power plant once it has been constructed.

Communities are built with the energy we create. Through the technologies we've helped developed, Waste Management is not just providing electricity. We are finding innovative reuses for the materials that would have otherwise gone to waste.

Reach Us

For more information, contact our office at 713-328-7374.

"We have the muscle to make these energy projects happen. Every year, Waste Management is opening new plants, and by 2020, we will produce enough energy to power two million homes."

Paul Pabor, vice president of renewable energy for Waste Management.

"Ecoline will allow us to power up to 85 percent of the campus using landfill gas."

Mark Huddleston, University of New Hampshire President.

Expand how you think about energy.

Gas Projects.

Dell Headquarters Austin, TX

More companies are becoming focused on sustainability. Not long ago, Dell announced it would make company-owned and leased facilities carbon neutral by 2008. To help achieve this goal, Dell tapped into Waste Management's Austin Community Landfill to help power its global headquarters. The compound, which takes up 2.1 million square feet and houses more than 10,000 employees, is receiving roughly 40 percent of its energy from one of our power plants.

University of New Hampshire Rochester, NH

UNH is the largest university in the state of New Hampshire with about 15,000 students. In 2007, the school worked with Waste Management to develop EcoLine, a project designed to pipe landfill gas from our Turnkey Recycling and Environmental Enterprise facility to its on-campus power plant. Through EcoLine, 80 to 85 percent of the campus' energy needs are being met.

Lafarge North America, Inc. Sugar Creek, MO

Lafarge, the largest supplier of cement products in the U.S. and Canada, is currently using landfill gas at its Sugar Creek plant to replace nearly 20 percent of its coal. Through this alternative energy, they are achieving an equivalent of planting 8,000 acres of forest or removing emissions from over 5,500 motor vehicles.

Suburban Landfill Savannah, GA

In 2009, our Suburban Landfill opened an energy plant that has since been producing enough electricity to power 3,500 homes in and around Savannah. Through this plant alone, we are creating the energy equivalent of roughly 25,000 tons of coal. Numbers say a lot, but what's most important to know is that communities are being powered by the same waste they generate.

Cascades Paper Mill Montreal, Canada

Rising fuel costs threatened to close the doors of the Cascades paper mill. Following an agreement with Waste Management's Ste. Sophie landfill, Cascades replaced 75 percent of the natural gas being used by its facility with landfill gas. This reduced costs, lowered their environmental footprint and is credited with keeping the plant in operation.

Emerging Technologies.

As we move into the future, Waste Management is exploring new uses for landfill gas that go beyond creating electricity. Maybe when you were younger you read Sci-Fi stories about using waste to make energy. Well, today those kinds of technologies are in the works. And while every new area we are looking at is in a different stage of development, all have the potential of finding uses for the materials we collect.

Altamont Landfill Livermore, CA

Not every landfill has enough gas flow to support a power plant, which is why Waste Management is investing in new technologies that find economic uses for this waste byproduct. Just outside of San Francisco, for example, we have developed the world's largest landfill-gas-to-liquid-natural-gas facility. This project converts gas created during waste decomposition into a natural gas or own fleet vehicles can run on. In fact, nearly 300 of our trucks are using this clean-burning fuel to run their routes.

Genomatica San Diego, CA

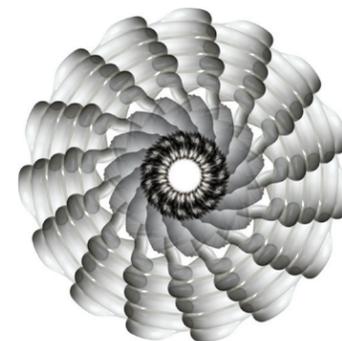
It's called syngas, or synthetic gas, and is often used to generate electricity. However, it can also be converted into other higher value materials. In 2011, Waste Management entered into a joint development agreement with Genomatica to create a process that converts landfill gas into syngas, and then converts that syngas into specialty chemicals, which can then be sold on the market.

Gas-to-Liquids

These days, fuel is a high commodity. That's why we are currently exploring different technologies that create cleaner-burning fuels, like diesel, from the things we pick up at the curb. Over the next 10 years, we are looking to improve our fleet emissions by 15 percent. We've already made great advances towards achieving that goal, and this technology will help us one step further.

2020

Between all of Waste Management's renewable energy offerings, including landfill gas, we will produce enough electricity to power two million homes by the year 2020. We're already making tremendous progress. In fact, we're more than halfway there, producing enough for 1.2 million homes. With every new investment we are redefining the value of waste. We want to make electricity. We want to create fuels. Every waste stream holds new opportunities and we want to change the way you think about those materials.



Your environmental solutions provider

Waste Management, Inc., based in Houston, Texas, is the leading provider of comprehensive waste management services in North America. Through its subsidiaries, the company provides collection, transfer, recycling and resource recovery, and disposal services. It is also a leading developer, operator and owner of waste-to-energy and landfill gas-to-energy facilities in the United States. The company's customers include residential, commercial, industrial, and municipal customers throughout North America.

**FOR MORE INFORMATION, PLEASE VISIT OUR WEBSITE AT
WWW.WM.COM OR CALL US AT 713-328-7374.**



THINK GREEN.®