



Earth911®
More Ideas, Less Waste

[How to Recycle](#)

[Where to Recycle](#)

[Business & Policy](#) [Earth Watch](#)

Reading time: 3 mins

What You Should Know About Renewable Natural Gas



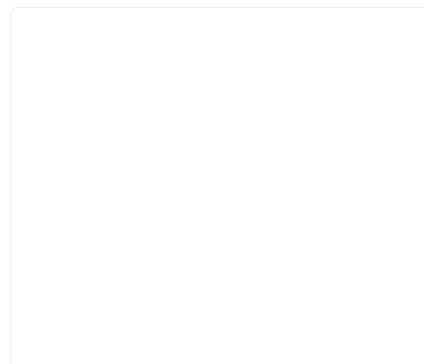
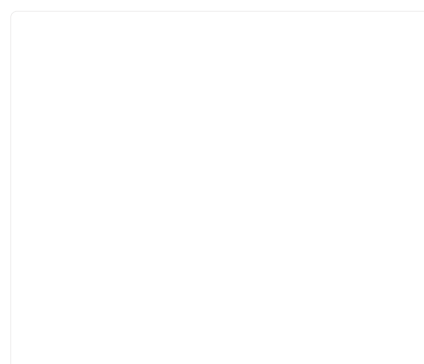
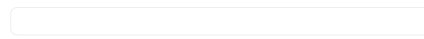
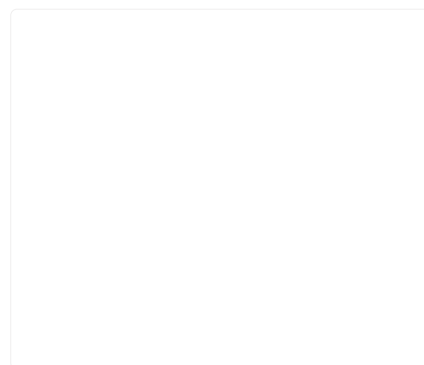
By [Gemma Alexander](#)

© JUN 27, 2022

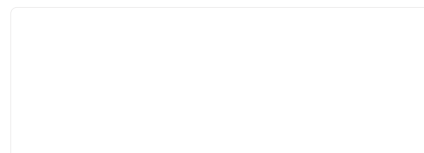


The energy we use and the garbage we throw away are usually part of a linear system that leads to outsized environmental footprints. But connecting the two by using waste to create energy creates a much more sustainable circular system. A lot of developing technologies attempt to convert waste into energy. But one of the most straightforward and practical is renewable natural gas.

Natural Gas



[Westlake Home - Luxury Organic Bedding](#)



Natural gas is made up mostly of methane. It is the largest source of electricity in the United States, accounting for **35% of our electric power**. Natural gas forms, **like coal**, from the decomposition of biological matter under pressure and heat in a process that takes centuries. Among fossil fuels, natural gas burns the cleanest. The only pollutant it releases is carbon dioxide, and it releases less carbon dioxide than either coal or oil.

But natural gas is neither renewable nor sustainable. Carbon dioxide is the most significant **greenhouse gas** contributing to climate change. And the environmental impacts of natural gas are not limited to emissions from burning. Extracting the gas is itself a fossil-fuel intensive process that generates significant emissions. Extraction methods like **fracking** can impact local hydrology and produce toxic and sometimes radioactive **wastewater**. It can even generate earthquakes and has been linked to **health impacts** in neighboring communities.

Landfill Gas

Compared to “the dump” of the 20th century, a modern **sanitary landfill** is a complex system that cleanly and safely contains garbage. But sanitary landfills still have an environmental impact. The most significant component of their carbon footprint is the generation of landfill gas (LFG). Landfill gas is formed when organic materials break down inside the landfill. Equal parts methane and carbon dioxide, LFG is a powerful greenhouse gas. By law, all landfills extract the odorous and highly flammable gas. Most of them burn the collected gas at flare stations, making landfills the third-largest source of human-related **methane emissions** in the United States.

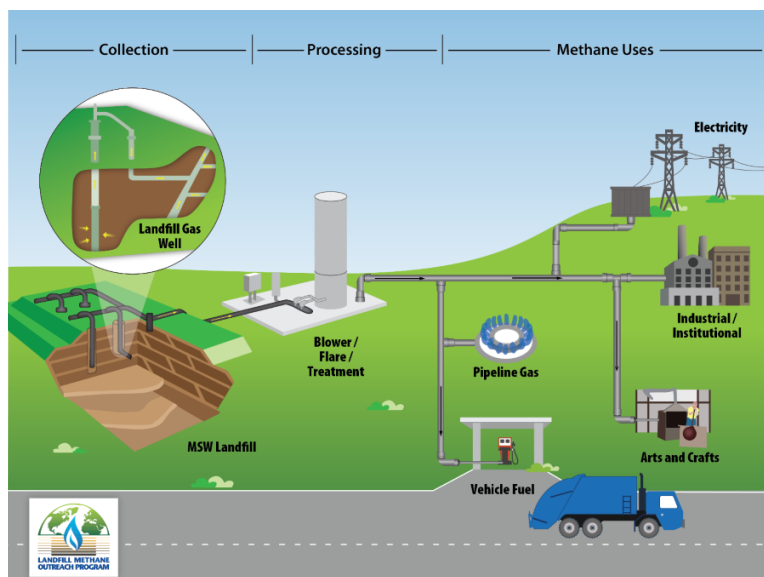


Landfill gas can be purified to pipeline-quality gas that is fully interchangeable with conventional natural gas. Renewable natural gas is also generated at wastewater treatment plants, livestock farms, food production facilities, and commercial composting operations.

Renewable Natural Gas

Because it takes centuries to form, true natural gas is not renewable. So the term “**renewable natural gas**” would seem to be an oxymoron. Landfill gas is chemically similar to natural gas. And it is renewable in the sense that it is created by the ongoing human activity of burying organic waste. With only a little processing, LFG can be purified to pipeline-quality gas that is fully interchangeable with conventional natural gas. It can be used in **natural gas vehicles** or distributed through the same pipeline system that powers homes. Today, about **69%** of currently operational LFG energy projects in the United States are used to **generate electricity**.

Landfill gas is a major source of RNG, but it is not the only source. A biogas is any gas that forms from the anaerobic decomposition of organic matter. Biogas contains 45%-65% methane and can be processed into renewable natural gas for use in place of conventional natural gas. In addition to landfills, RNG is generated at wastewater treatment plants, livestock farms, food production facilities, and **commercial composting** operations. To date, agriculture-based RNG projects **outnumber** landfill-based projects.



The image illustrates the multiple purposes of processed landfill gas, including pipeline gas we use in our homes. Image source: [epa.gov](https://www.epa.gov)

Benefits of RNG

Replacing conventional natural gas with renewable natural gas reduces greenhouse gas emissions from landfill operations, as well as from natural gas extraction. But it has other **benefits**, too. Hazardous air pollutants and **VOCs** that are present at low concentrations in LFG are destroyed, rather than released into

the atmosphere. LFG energy projects generate revenue for the utility while often providing electricity to the customer at lower cost. Renewable natural gas is usually consumed locally, rather than transported across long distances in pipelines or trucks. The expenses from a project producing RNG also mostly benefit local economies in the form of jobs associated with the project.

Better than RNG

Although renewable natural gas is preferable to conventional natural gas, the [Zero Waste hierarchy](#) dictates that we don't purposely toss compostable materials in the garbage. Where possible, organic matter should be composted and used to improve soil health. Where possible, electric energy should come from [renewable sources](#) that are cleaner than gas. But as long as there are landfills, LFG will be generated. Commercial composting and industrial agriculture also produce some gases that can be refined for use as RNG. So there is still a place for RNG in the energy mix. Some utilities, like [Puget Sound Energy](#), offer RNG as part of a green power portfolio program. Check to see if [your local utility](#) is one of them.

advertising



Reading time: 3 mins

[Best of Earth911 Podcast: Atlantic Packaging's Wes Carter on Making Commerce Sustainable](#)



By [Gemma Alexander](#)

Gemma Alexander has an M.S. in urban horticulture and a backyard filled with native plants. After working in a genetics laboratory and at a landfill, she now writes about the environment, the arts and family. See more of her writing [here](#).

Related Post

[Business & Policy](#) [Food & Beverage](#) [How & Buy](#) [Podcasts](#)

[Best of Earth911 Podcast: Atlantic Packaging's Wes Carter on Making Commerce Sustainable](#)

Jun 27, 2022 Earth911