



WHAT IS RENEWABLE NATURAL GAS (RNG)?

Renewable Natural Gas (referred to as RNG or biomethane) is a renewable fuel option made by capturing and refining the methane-rich biogases emitted from decomposing organic materials like food scraps, animal manure, and sewage sludge. Once refined, this fuel is interchangeable with geologic natural gas but has much lower “lifecycle” emissions, and can be transported and used in the same gas pipelines and infrastructure. As an energy source, RNG can “decarbonize” the gas grid. As a transportation fuel, RNG can readily replace high-carbon diesel in trucks and buses.

IS IT REALLY RENEWABLE?

Yes, it is, and it requires NO drilling or fracking. What makes it entirely renewable is that it's derived from the abundant sources of organic waste generated every day by normal human and animal activity. Because the climate-changing gasses emitted by decomposing organics are already “above ground,” it's possible—and critical in the fight against climate change—to trap them before they escape into the atmosphere.

SO DECOMPOSING WASTE EMITS RNG?

Not exactly. RNG is created when biogas has been “upgraded” to pipeline quality, meaning that carbon dioxide, moisture, and other impurities have been removed. Biogas is generated anywhere organic materials—food waste, animal manure, yard debris, crop cuttings, wastewater—decompose without oxygen. This process of “anaerobic digestion” (anaerobic = “no oxygen”) produces methane (~60%), carbon dioxide (~39%) and trace amounts of other materials.

HOW IS BIOGAS CAPTURED?

The natural process of anaerobic digestion (“AD”) takes place in the airless environment of landfills: biogas is captured by drilling wells into the landfill. The AD process is readily replicated using technology as simple as covered pits (commonly used for manure in farm-based operations) or as complex as multi-stage processing facilities with storage tanks and control rooms that accelerate the natural decomposition process for anything from manure to food waste to sewage.

WHAT CAN RNG BE USED FOR?

Since RNG is interchangeable with conventional natural gas, it can be used in all the same applications — cooking, heating/cooling, power generation, transportation, industrial uses and more. The big opportunity for RNG today is as a replacement for diesel fuel in heavy-duty buses and trucks.

Be sure to check out EV's [Publications](#) and [Factsheets](#) for more about the benefits of using RNG.

WHY USE RNG?

FIGHTING CLIMATE CHANGE. According to the California Air Resources Board, on a lifecycle basis, the use of RNG in natural gas vehicles represents a 70%-300% net reduction in greenhouse gas (GHG) emissions compared to diesel, and a 50% or more reduction compared to fossil natural gas on average. How can you get a 300% reduction? Because production and use of RNG both captures methane emissions from organic waste that would otherwise escape into the atmosphere AND displaces emissions from fossil fuels.

IMPROVING PUBLIC HEALTH. The use of RNG as a transportation fuel reduces air pollutants known to cause lung and heart disease. When burned in near-zero emission natural gas vehicles, RNG cuts smog-forming nitrogen oxides (NOx) by 90% compared to the most stringent EPA standards for diesel engines. Its use also minimizes health-threatening particulate matter (PM) emissions, protecting vehicle operators from respiratory and cardiovascular illnesses, and reduces hearing loss—these engines are 50-80% quieter than diesel.

ENERGY INDEPENDENCE. RNG is a domestically abundant resource that can substantially decrease US dependence on foreign oil. Although the U.S. is a net oil exporter, it still imported about 8.32 million barrels per day of petroleum from 80 countries in 2022.

SUSTAINABLE RESOURCE MANAGEMENT. When organics are recycled in anaerobic digesters, the process produces renewable energy and high-grade compost. As a result, producing RNG helps solve a major waste disposal problem: it turns organic wastes (about a third of the municipal waste stream) from “garbage” into a valuable energy and nutrient resource. Several states (including NY and CA) now require organics recycling.

JOB CREATION. Investment in the RNG industry has surpassed \$3 billion, a significant portion of which has been deployed since 2016. Independent economic analyses have estimated that the industry has also created nearly 50,000 jobs – direct and indirect – associated with the construction and operation of RNG facilities, manufacture of equipment, and related ancillary services. On a per-project basis, average investment in RNG infrastructure ranges from \$16-50 million, with a total employment multiplier of approximately 12 jobs per million dollars invested.

EASY IMPLEMENTATION. Using RNG requires no special/unique infrastructure. The US has the most extensive natural gas pipeline network in the world, covering more than 3 million miles. Over 30% of transit buses in the US run on natural gas and 60% of refuse truck orders are for natural gas models. These heavy-duty trucks, equipped with near-zero engines, can use RNG and immediately slash greenhouse emissions and harmful pollutants. In 2022, 69% of all on-road fuel used in natural gas vehicles was RNG.

HOW MUCH RNG IS THERE IN NORTH AMERICA?

Today, about 300 facilities produce RNG, with most delivering gas to heavy-duty vehicles, and another 470+ are planned or under construction. However, around 2,100 biogas systems already operate at landfills, farms and wastewater treatment plants, with as many as 14,000 more potential sites in the US, according to estimates by government, academia and NGOs.

Therefore, using known resources and proven technology, America’s potential RNG resource could displace more than 25% of on-road diesel fuel, or 10+ billion gallons annually. To put this in perspective, that’s enough RNG to power 3.5 million homes or offset 5-10% of current conventional natural gas demand and eliminate 90.2 million tons or more of carbon emissions per year.

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