
Middlesex County Utilities Authority landfill, East Brunswick, New Jersey

Photo: MCUA

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Renewable Natural Gas

PSE&G is aggressively pursuing opportunities to provide customers with a lower-carbon future. PSE&G has a history of evolving how it delivers gas to customers and being at the forefront of industry innovation.

On March 1, 2023, PSE&G submitted a $123 million renewable natural gas (RNG) plan, as part of its proposal for the third phase of its Gas System Modernization Program, which would run into 2027.

RNG is a biogas that has been upgraded for use in place of natural gas. The biogas used to produce RNG comes from a variety of sources, including municipal solid waste landfills, digesters at water resource recovery facilities (wastewater treatment plants), livestock farms, food production facilities and organic waste management operations[1]. Once the biogas is upgraded, RNG is compatible with existing distribution systems and appliances. In New Jersey, landfills and wastewater treatment plants are likely the most viable RNG sources.

The proposed RNG facility would inject processed landfill gas into PSE&G's gas distribution system. Compared to natural gas, the RNG production and transportation pathway results in less carbon-intense fuel, repurposing it into an energy source that is compatible with both PSE&G's infrastructure and customers' appliances.

The RNG plan, a collaboration with the Middlesex County Utilities Authority (MCUA), would reduce an estimated 27,000 to 36,000 metric tons of CO2e per year compared to natural gas. This project would also improve regional air quality by reducing air pollutants annually, including tons of nitrogen oxide, carbon monoxide and sulfur dioxide. The inclusion of RNG is an important lower-carbon step in the transition to cleaner fuels.

This project would improve regional air quality by reducing air pollutants.

RNG facility highlights

The facility would have many safety features, including a system for removal of impurities from the biogas, allowing for approximately 1,000,000 MMBTU per year of pipeline quality RNG that would be injected into PSE&G's existing Central 35 psig gas distribution system. The facility would have approximately 93% uptime and would be able to provide a consistent, reliable and lower-carbon form of supply to PSE&G's natural gas customers.

Environmental highlights

RNG has distinct benefits as a decarbonization strategy. RNG has lower life cycle greenhouse gas (GHG) emissions than natural gas and can be introduced into the gas distribution network safely and used by customers to reduce GHG emissions without any changes to existing equipment or appliances.

RNG projects positively impact public health, climate and air quality by:

- Contributing to reducing the carbon intensity of fuels burned
- Capturing emissions that would otherwise escape to the atmosphere
- Leveraging existing waste streams
- Sourcing the gas directly in PSE&G's territory, lessening transportation through interstate pipelines from out of state locations.

Air quality improvement

Due to the removal of the MCUA's electric generation units, the RNG project would result in a net air quality improvement for New Jersey. Quantified net reductions for the following air pollutants have been identified: nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO2), particulate matter 2.5 (PM 2.5), and particulate matter 10 (PM10).

Emissions (tons/yr)	
Air Pollutant	**Quantified Reduction**
NOx	-20.55
CO	-0.91
SO2	-22.82
VOC	0.25[*2]
PM2.5	-4.22
PM10	-4.21
PM	-4.20

What is an RNG facility?

A renewable natural gas facility involves several components that receive biogas from an existing source, such as a landfill or wastewater facility, and process and condition the gas into a pipeline quality product that can then be used as an alternative to traditional natural gas.

Incoming biogas has moisture, hydrogen sulfide, carbon dioxide and other trace elements that are removed during the conditioning process. A chromatograph and other sensors monitor the quality of the product being produced and are used to prevent an out-of-spec product from entering the distribution system.

The resulting renewable natural gas can be compressed and stored, used onsite to create electricity or injected into an existing natural gas distribution system. An RNG plant also typically has a metering and pressure regulation component.

1 https://www.epa.gov/lmop/renewable-natural-gas#basics

2 In a conservative estimate based on preliminary design basis, PSE&G and MCUA have concluded that, no net increases of direct air pollutants would result from the RNG project – except for a minor increase in volatile organic compounds (VOC).