



Cutting Emissions With Innovation

Biogas generation is a natural byproduct of anaerobic digestion, a key process for treating biosolids intended for land application. Historically, the facility used this biogas to fuel digesters or operate co-generation engines that supplied both heat and electricity. However, not all of the biogas was utilized—excess volumes were flared—and the on-site combustion contributed to emissions and a larger carbon footprint.

In 2019, South Platte Renew (SPR) completed the Pipeline Injection Project, becoming the first facility in Colorado to upgrade biogas to pipeline-quality renewable natural gas (RNG). Today, SPR produces approximately 1.98 million m³ (70 million cubic feet) of RNG annually, offsetting emissions equivalent to approximately 15.3 million km (9.5 million miles). Since the project's launch, SPR has reduced nearly 21 000 metric tons of CO₂eq, equal to eliminating the emissions from driving 90.1 million km (56 million miles).



REDUCE



RECOVER



ENGLEWOOD, COLORADO, USA



WASTEWATER



INDUSTRIAL

CHALLENGES FACED

As the first facility in Colorado to convert biogas into pipeline-quality natural gas, South Platte Renew faced operational unknowns and limited training, relying heavily on trial and error. Staff encountered shutdowns, high-pressure gas compression, and combustion equipment exceeding 816 °C (1,500 °F), which initially caused hesitation. With time and added resources, SPR fine-tuned operations, overcame challenges, and built confidence in the system's reliability.

TECHNOLOGIES & SOLUTIONS USED

The Pipeline Injection System uses a Unison BioCNG 400 upgrader and a Ship & Shore Regenerative Thermal Oxidizer. Biogas is treated through hydrogen sulfide removal, cooling, compression, and carbon media filtration, then processed in a two-stage membrane to separate carbon dioxide. The resulting Renewable Natural Gas (RNG) meets pipeline standards and is injected into the grid, while the CO₂ is incinerated to improve environmental performance.

IMPACT & INSIGHTS



Since its startup in October 2019, South Platte Renew's pipeline injection system has produced nearly 1.98 million m³ (70 million cubic feet) of renewable natural gas yearly, totaling approximately 11.65 million m³ (411 million cubic feet) to date. The USD \$7.8 million capital investment was fully recovered by July 2025 through gas and renewable fuel credit sales. From that point forward, all net revenue has gone to the cities of Englewood and Littleton, helping reduce customers' sewer rates. The system also cuts about 3.7×10^6 kg (3,700 metric tons) of carbon dioxide annually, the equivalent of eliminating nearly 14.5 million km (9 million miles).

LESSONS LEARNED



- Build redundancy into design (e.g., backup compressors)
- Use a size compressor/motor to handle full gas capacity
- Use a thermal oxidizer to reduce moving parts and failures
- House equipment in a controlled environment to avoid weather-related shutdowns
- Engage closely in system design and vendor specifications
- Begin operator training early through utility shadowing to understand operating principles

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With the initial investment fully recovered, revenue from the pipeline injection system helps reduce community sewer rates, lowering household expenses for all ratepayers.

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