INSIGHT

Unlocking the Hidden Value in RNG Facilities

Plant Betterment, Profitability, and Performance

The renewable natural gas (RNG) market has reached a turning point. While new construction has slowed, competition has intensified. Facility owners now face a different challenge — not "Where do I build next?" but "How do I maximize the return on my existing assets?"

You can manage interrelated systems at your plant in a way that ensures safety, increases revenue, reduces costs, and improves reliability. With the right approach, RNG facilities can achieve measurable performance improvements without major capital investments while at the same time being best positioned to increase profitability by adding new feedstocks and undertaking sensible equipment upgrades.

Reducing Downtime, Increasing Uptime

Downtime is the most expensive problem an RNG operator faces. Every day a facility is offline represents thousands of dollars in lost revenue. Most downtime can be avoided through better monitoring, maintenance, and compliance management.

Gas Quality and Pipeline Compliance

Bartlett & West senior wastewater engineering specialist James Krumwied explains, "For every day you're down, you're losing money — it's strict opportunity cost." Case in point, a municipal RNG facility had nitrogen in its RNG at levels that prevented it from injecting its RNG into the interstate pipeline, which led to 30 days of downtime. Bartlett & West was brought in to assess and the root cause, a digester air leak, was identified and quickly addressed.

Maintenance Failures

Hydrogen Sulfide (H_2S) in raw biogas, when not properly respected, can lead to premature gas scrubbing equipment failures that are costly and potentially life-threatening. In one situation, Bartlett & West identified a neglected H_2S filter at a municipal RNG plant that could have damaged the downstream gas scrubber and cost its client millions of dollars. To avoid those failures, facility operators should implement a rigorous testing schedule for H_2S media and make sure operations staff are trained in the best-in-class gas sampling methods to proactively and intelligently stage H_2S media replacement.

Monitoring and SCADA Integration

With the mad rush to build digesters in the 2019-2024 period, control systems were often overlooked. Now many facilities are bogged down by control systems that don't talk to one another. Plants that fail to integrate controls lose the ability to trend performance data, anticipate problems, and act before shutdowns occur.

Bartlett & West can help rewire and reprogram existing control systems to improve operational visibility. "Improved control system integration results in increased uptime, better operator visibility, [its] safer — because all your components are integrated into one SCADA system instead of jumping around," Krumwied notes.

Cost Savings Through Smarter Operations

Predictive Maintenance

With a control system working in harmony, you can seamlessly integrate other data sources to squeeze out efficiencies and reduce downtime, even things as simple as nuts and bolts. Bartlett & West senior engineering specialist Matt Freed highlights, "You can find bearing failures before they happen… preventative maintenance, predictive maintenance really."

Equipment Upgrades, Cheaper Parts

As the RNG space has evolved, so has the equipment it uses. What used to cost $120,000 for a gas chromatograph to ensure gas quality compliance can now be had for as little as $25,000.

Spare Parts and Asset Management

Supply chain issues can lead to wide variations in equipment replacement lead time. Sometimes capital-intensive inventory strategies more than pay off in the long run. Bartlett & West senior operations consultant Mark Simms explains, "It might sound excessive to keep a $50,000 compressor on the shelf, but if it takes three to six months to get a replacement, the cost of downtime makes it worth it."

Increasing Biogas Yields, Growing Revenue

Feedstock Optimization, Process Control and Stability

With a growing number of RNG facilities looking to co-digest new feedstocks to increase RNG production, process control is critical to avoid VFA events, foaming, and other catastrophic events that can lead to significant down time.

When feedstocks like fats, oils, and grease (FOG) can boost gas production by 20%, it's important to fine tune your facility to realize that production bump. But you must introduce different feedstocks with care.

"If the temperature is not carefully regulated, the digester can get sick," Simms cautions. From feedstock analysis to mixing and temperature control, Bartlett & West can make sure new feedstocks meet both a client's production and revenue target goals, while at the same time ensuring compliance with different regulatory programs so you can maximize the value per mmbtu of gas.

Leak Detection and Recovery

While fine tuning a digester's chemistry takes a nuanced, interdisciplinary approach, sometimes it's the little things that can lead to big wins, big wins that are only possible when you take a comprehensive look at the plant.

"We went from 95–96 percent to 98.5 percent recovery just by finding little leaks in the [pipe] threads," Freed said. That three to four percent improvement translates into millions of cubic feet of additional gas sold over the life of the facility.

Safety as Profit Protection

Hydrogen Sulfide (H?S)

"Raw gas from a dairy digester could be up to 5,000 ppm H_2S," Krumwied cautions. "At 1,000 ppm it can kill you instantly." Proper H_2S management cannot be stressed enough. It is important to create operational programs and pinpoint process upsets to reduce the danger H_2S presents to both people and equipment.

Conclusion

RNG facility owners face a critical decision — optimize existing assets or lose money and time. Plant betterment offers a proven path to reducing downtime, increasing uptime, cutting costs, and growing revenue.

Bartlett & West's RNG Services

What sets our team apart is the combination of practical operating experience and multi-disciplinary engineering expertise. "Clients may hire a process engineer, but we bring process, civil, structural, electrical, architectural and I&C, in addition to operations, optimization, owners representative and other services — the whole team. We catch [code] violations others miss," Krumwied says.

Our experts have:

- *Diagnosed issues that kept clients offline for weeks*
- *Prevented multimillion-dollar equipment failures*
- *Boosted gas output by 5-20% through feedstock and leak optimization*
- *Reduced OPEX with cost-effective equipment replacements*
- *Provided routine and after-hours operations and maintenance services, as well as gas sampling with a certified technician*

To learn more, download our webinar "Lessons learned in RNG project design, construction and operation" at https://www.bartlettwest.com/insight/lessons-learned-rng-project-design-construction-and-operation.