Clean Energy Solutions | Partnership | Success

BGXSOLUTIONS

XEBEC POWERS AN ENERGY EVOLUTION

Case Study: Massive U.S. landfill uses XEBEC M-3100 system to purify biogas to pipeline-grade natural gas for 25,000 Duke Energy customers.

Rumpke Landfill Biogas Project at a Glance:

Type: Landfill biogas to pipeline-quality renewable natural gas

Claim to fame: One of the largest gas recovery operations of its kind in the world

Location: Cincinnati, Ohio

Number of acres-landfill: 230 (93 hectares)

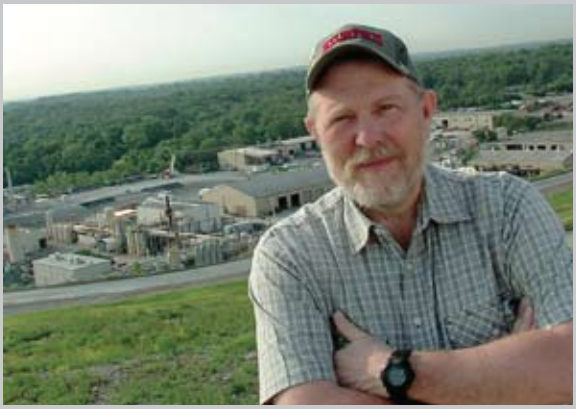
Waste received annually: Two million tons

Plant refining capacity: 15 million cubic feet of landfill gas per day

Distribution: 25,000 Duke Energy customers

Incentives: Carbon Trading Renewable Energy Credit (REC) Program

Gas purification system of choice: XEBEC M-3100 PSA system



Rick O'Mahony, VP of Operations and Facilities Development for Montauk Energy Capital, says Montauk Energy chose XEBEC's M-3100 gas purification system for its reliability, compact design, ease of maintenance and low operating costs.

Building a Better Gas Purification System

At the Rumpke Sanitary Landfill near Cincinnati, Ohio, Montauk Energy Capital LLC operates plants that purify biogas generated from more than two million tons of waste annually into pipeline-grade natural gas. The purified natural gas, also known as biomethane, is injected into the local Duke Energy pipeline and distributed to more than 25,000 area homes and businesses.

Montauk Energy trusts XEBEC's propriety M-3100 gas purification system to perform the critical operation of upgrading the biogas. Rumpke was the first landfill facility to install XEBEC's pressure swing adsorption (PSA) gas purification systems in 2007.

"We made the right choice," said Rick O'Mahony, VP of Operations and Facilities Development for Montauk Energy. "We have used, reviewed and tested numerous PSA and other gas purification systems. The XEBEC PSA system provides reliable operation and better upgrading capacity on a much smaller platform than other purification systems."

XEBEC's Role at Rumpke

At Rumpke, biogas containing methane, carbon dioxide, water and hydrogen sulfide is transported from the landfill through 24-inch pipe to a pretreatment site that removes the hydrogen sulfides and volatile organics from the gas.

However, harmful contaminants such as carbon dioxide remain in the biogas. Montauk Energy uses PSA systems to purify (or upgrade) the biogas to remove the carbon dioxide and other contaminants. Montauk installed its first PSA system at Rumpke for landfill gas recovery in 1986 and a second in 1995. Both are conventional PSA systems, which are large, slow, bulky, complex and expensive to operate.

In 2006, when Montauk was adding a third gas purification system at the Rumpke landfill, it looked at new, advanced gas purification technologies. Montauk chose XEBEC's M-3100 PSA system.

XEBEC ADSORPTION INC. | 730 Boul. Industriel, Blainville, Quebec, J7C 3V4 Canada
Toll Free: 1-877-88-XEBEC | **Phone:** (450) 979-8700 | **Fax:** (450) 979-7869 | **Email:** biogassales@xebecinc.com

Clean Energy Solutions | Partnership | Success

BGX SOLUTIONS

Montauk Cites XEBEC Advantages

- Compact, skid-mounted design
- Strong reliability
- Lower total cost of ownership
- Ease of maintenance and operation (fully automated, unmanned capability)
- Significant and lasting revenue streams

Comparing XEBEC

XEBEC's proprietary rapid-cycle technology allows XEBEC's PSAs to operate at higher cycle speeds than conventional PSA systems. This decreases the amount of adsorbent material required and significantly reduces the size of the gas purification equipment. In fact, XEBEC's PSA systems are up to 10 times smaller than conventional PSA technology, and are skid-mounted on a portable platform, making them easy to move or relocate.

XEBEC's proprietary rotary valves replace the bulky piping and valves of conventional systems. These rotary valves are compact, reliable and low maintenance, leading to lower operating costs and low total cost of ownership.

"The XEBEC PSA system is a significant step forward for our landfill gas operation," added O'Mahony. "We save space, capital costs and labor costs, and XEBEC's PSA systems help ensure that we provide the clean, pure natural gas that Duke Energy demands."

The natural gas that is produced at Rumpke and injected into the pipeline for distribution to Duke Energy customers is more than 96% pure. The XEBEC system has never been shut-in by the utility for off-specification gas. The XEBEC M-3100 provides feed flow at Rumpke of 6.0 million standard cubic feet per day (mmSCFD), though the M-3100 system can upgrade up to 9 million cubic feet of feed gas per day.

XEBEC's gas purification systems have been installed in more than 120 locations in 23 countries around the world. The M-3100 and M-3200 are the PSA systems of choice for biogas to renewable natural gas operations for wastewater treatment, agriculture and landfill projects.

In addition to gas purification systems, XEBEC offers integrated upgrading plants that include all the equipment necessary to produce purified renewable natural gas from raw biogas. These plants offer project developers a turn-key biogas upgrading solution.

The XEBEC M-3100 gas purification system at Rumpke landfill provides pipeline-grade natural gas to Duke Energy customers in Ohio.

Contact Us

If you would like to learn more about XEBEC's proprietary gas purification products, please contact:

biogassales@xebecinc.com

About XEBEC Adsorption Inc.

XEBEC ADSORPTION INC. is a developer and supplier of proprietary and conventional gas purification systems for several large international markets, including biogas production, natural gas processing, natural gas for NGV's, oil refining and compressed air. XEBEC is based in Blainville, Quebec.

NOTE TO READER: At the time this document went to print, Xebec Adsorption Inc. and QuestAir Technologies Inc. were in the process of a merger transaction. All Questair IP will become the property of the combined company under Xebec Adsorption Inc.

XEBEC ADSORPTION INC. | 730 Boul. Industriel, Blainville, Quebec, J7C 3V4 Canada
Toll Free: 1-877-88-XEBEC | **Phone:** (450) 979-8700 | **Fax:** (450) 979-7869 | **Email:** biogassales@xebecinc.com