

POWER PROFILE

Customer: Harvest Power

Location:

Orlando, Florida, USA

Customer Business Issue:

Renewable power generation using an anaerobic digester

Solution:

Two Cat® G3520C generator sets

Cat® Dealer:

Ring Power Cat



Founded in 2008, Harvest Power specializes in organics management, including generating biogas and renewable energy from food waste.

POWER NEED

Food waste is one of North America’s greatest challenges, with compostable organic material making up the largest and heaviest portion of the overall waste stream.

Founded in 2008, Harvest Power specializes in organics management, including generating biogas and renewable energy from food waste. With more than 20 facilities across the U.S. and Canada, Harvest Power helps communities better manage and re-use their organic waste through the production of renewable energy, soils, mulches and natural fertilizers.

The company has been recognized with numerous awards, including being named one of the “50 Most Innovative Companies in the World” by Fast Company and ranking among the “Global Cleantech 100” for five consecutive years.

As a tourist destination filled with hotel resorts, shopping centers and amusement parks, Orlando, Florida produces more than 120,000 tons of organic waste per year.

“It was natural to pursue partnerships with local companies who can separate their organic waste and also share an interest in sustainability,” said Jeremy Goodfellow, vice president of energy operations for Harvest Power.

Harvest Power constructed an anaerobic digester in the Orlando area – with Walt Disney World as its first and largest supplier of food waste – to showcase the benefits of diverting large-scale food waste and other organic materials away from landfills.

“We’re always looking for innovative ways to conserve natural resources and protect the environment,” remarked Bill Warren, administrator for Reedy Creek Improvement District, which provides utility services to 250,000 acres of amusement parks and attractions at Walt Disney World.

In order to convert the food waste into a renewable resource, Harvest Power required generator sets that could process biogas and ultimately create electricity for the Central Florida region.

SOLUTION

Harvest Power worked with Ring Power Cat to develop a solution to convert biogas from the anaerobic digestion process into renewable energy while utilizing excess heat from the process. Two Cat G3520C generator sets were supplied in a modular building to consume the biogas, use the engine jacket water heat to maintain the optimal digester temperature, utilize the generator exhaust heat to dry the fertilizer and create 3.2 MW of electricity. The power plant facility uses about 20 percent of the electricity generated and sells the rest back to the local utility.

The generator sets are placed inside an enclosure with switchgear and customer connection points conveniently located outside the generator room.

Digested organic material is dewatered creating a black granular fertilizer, which is sold to area farmers and retail outlets.

“The fertilizer is used to grow more food, which comes back to central Florida and is sold in produce markets, grocery stores and restaurants,” added Goodfellow. “So it’s a closed loop where the organics that are normally going to landfill and would have been wasted come to us to be used for renewable energy and fertilizer. The nutrients go back into the ground to be reused.”

RESULTS

With approximately 24 pounds of food waste entering a central Florida landfill every second, Harvest Power is committed to helping local communities discover new ways to process and more efficiently use this material.

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In the case of this facility, the two Cat G3520C generator sets produce enough energy to power more than 2,000 homes each year.

“The Cat engines are very efficient and capable of handling the variations in biogas,” said Mark Greiner, Plant Manager for the Harvest Power facility. “Here at our site, we have biogas storage—a double membrane system—and the level in that membrane fluctuates based on gas production and use. The software that controls the Cat generator sets interfaces with our facility software to increase and decrease the load on the generator sets based on biogas levels. The system works in auto mode, and it’s very efficient in increasing or decreasing the loads based on biogas availability.”

Harvest Power relies on Ring Power Cat to monitor the generator sets and ensure they are operating at peak levels, which allows the company to solely focus on organics management.

“Ring Power has been with us step by step, making sure that any issues that we have had with the engines or anything with the heat delivery system are resolved quickly,” added Greiner. “We found that Caterpillar and Ring Power wanted us to succeed. It’s great to have people on your team who care about customers and put customers first.”

For more information, please visit cat.com/powergeneration



Two Cat® G3520C generator sets consume biogas and create 3.2 MW of electricity from organic waste delivered from Walt Disney World and other restaurants, hotels and food processors in Central Florida.