

RENEWABLE Energy

FROM WASTE

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Harvest Power is providing central Florida with electricity from food scraps and other organics generated by the millions of tourists that visit the area each year.

Part of the Magic



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ON THE WEB:



Latest news: Visit www.REWmag.com for the latest waste conversion technology industry developments.

Conference updates: Learn about the 2014 edition of the Renewable Energy from Waste Conference at www.REWConference.com.

Video: Visit the Multimedia page of www.REWmag.com for a video of cover profile company Harvest Power's Central Florida Energy Garden.

Online exclusives: Extra resources on food waste recycling and an in-depth Q&A with Blue Sphere Corp. CEO Shlomi Palas can be found online at www.REWmag.com.



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Part of the Magic

Harvest Power is providing central Florida with electricity from food scraps and other organics generated by the millions of tourists that visit the area each year.

BY KRISTIN SMITH

Orlando, Florida, attracts some 52 million visitors each year who want to experience the magic of Walt Disney World. What they may not know is that organic waste from the theme park and surrounding communities helps make the magic happen.

Thanks to Waltham, Massachusetts-based Harvest Power, local electricity is

produced from organic waste streams generated at nearby theme parks, hotels and restaurants. In addition to visitors, another 2 million people call the Orlando area home. Add to that a large agricultural setting with food processors, and the result is hundreds of thousands of tons of organic waste in the form of food scraps; fats, oils and greases (FOG); and human biosolids.

The Reedy Creek Improvement District (RCID), responsible for providing municipal services for the area, had been processing the organics at its wastewater treatment plant (WWTP) and composting operation for the last 20 years and was interested in improving efficiencies and eliminating odors. RCID worked with Harvest Power to redesign its facility to produce energy from organics.

Harvest Power is managing the food waste separated from Disney World and codigesting it with the biosolids from the wastewater treatment plant through anaerobic digestion (AD). Several other food waste generators, from hotels to fresh produce companies, also are diverting food waste to the Central Florida Energy Garden. The facility, which opened in November 2013, is already producing more power than it needs from the process of anaerobic digestion. According to Paul Sellw, Harvest Power executive chairman, the remaining power is sold back to the grid “so we can now in effect power part of the theme park with organic energy generated from the organic waste.”

WHAT'S NEXT?

Sellw has been involved in organics recycling for more than 30 years. His family also owns a large nursery business. He says when he started Harvest Power five years ago, he asked the question, “What’s next with organics?”

Sellw says Harvest Power was inspired by the more than 4,000 existing composting operations in the U.S. They were driven, he says, by regulatory issues which banned yard waste from going to landfills and mass-burn facilities. Composting is only getting about 60 percent of yard waste, according to Sellw. He also notes that only 3 or 4 percent of food waste is being recovered.

“In addition to composting, which we are bullish on, AD is clearly a proven technology that has been in wide-scale use in the wastewater treatment industry for decades and recently in Europe, specifically in Germany, expanding in use for other organic waste streams such as food waste and various agricultural waste inputs,” describes Sellw.

Harvest Power was built around a

technology platform of composting, advanced composting and anaerobic digestion, according to Sellw. “The idea is to extract the maximum value which would be the production of fertilizer, compost or compost-based mulch products,” he says, adding, “The great thing about our technology platform is we can go to composting, we can go to anaerobic digestion or a combination of those two.”

Harvest Power operates 40 composting and bagging facilities and three AD facilities. They include the Central Florida Energy Garden in Orlando, Florida, as well as facilities in London, Ontario; and in Richmond, British Columbia; with a combined processing capacity of 1,000 tons per day. All three AD facilities have started up within the last year, and more facilities are in the works. “We have a big pipeline of projects that are in development right now,” says Sellw.

FLORIDA FOCUS

The Central Florida Energy Garden has the capacity to receive an estimated 130,000 tons of material annually made up of food scraps, FOG and biosolids. The biosolids are connected directly into a tank and then are sent to a liquid receiving area. Local haulers, including Phoenix-based Republic Services, deliver organic waste to the facility. The



Harvest Power at a glance:

Headquarters: Waltham, Massachusetts

Principals: Kathleen Ligocki, CEO; Paul Sellw, executive chairman

No. of employees: 600

Services provided: organics recycling; advanced composting; anaerobic digestion

Products: biogas; combined heat and power (CHP); natural fertilizers; compost; compost-based soils; mulches

No. of facilities: 40 composting/bagging; 3 anaerobic digestion: Orlando, Florida; London, Ontario; and Richmond, British Columbia



trucks dump the organics into a receiving pit. The material then goes through depackaging equipment to remove plastics and metals.

Depackaging allows for a small amount of contamination that would not be acceptable in a composting facility, such as packaged meats. Chris Peters, the Florida region vice president for Harvest Power explains, "In the traditional composting envi-

ronment, you can't do that because you don't want that to end up in the compost."

Once the organics are depackaged, they are pumped into a tank where the food, biosolids and FOGs are all mixed together. "It gives us a homogenous mix and we pump it into our digester," says Peters. The facility has two tanks which hold more than 1 million gallons each

of the mixture. Material remains in the tanks for approximately 22 days where it breaks down and produces biogas. The biogas is siphoned out of the tanks and housed in a dome-shaped tank where it runs two generators producing a combined 3.2 megawatts (MW) of electricity.

Once the material is finished digesting and all the gas is captured, it is taken back to the receiving area and dewatered. The water is cleaned and given back to RCID where it is used in landscaping, irrigation and fire hydrants. Exhaust heat from the generators heats a thermal oil which is used to evaporate the remaining water from the digestate and create the natural fertilizer, reducing the need for petro-chemical fertilizers. In addition, a phosphate-rich mineral called struvite is extracted from the liquid stream.

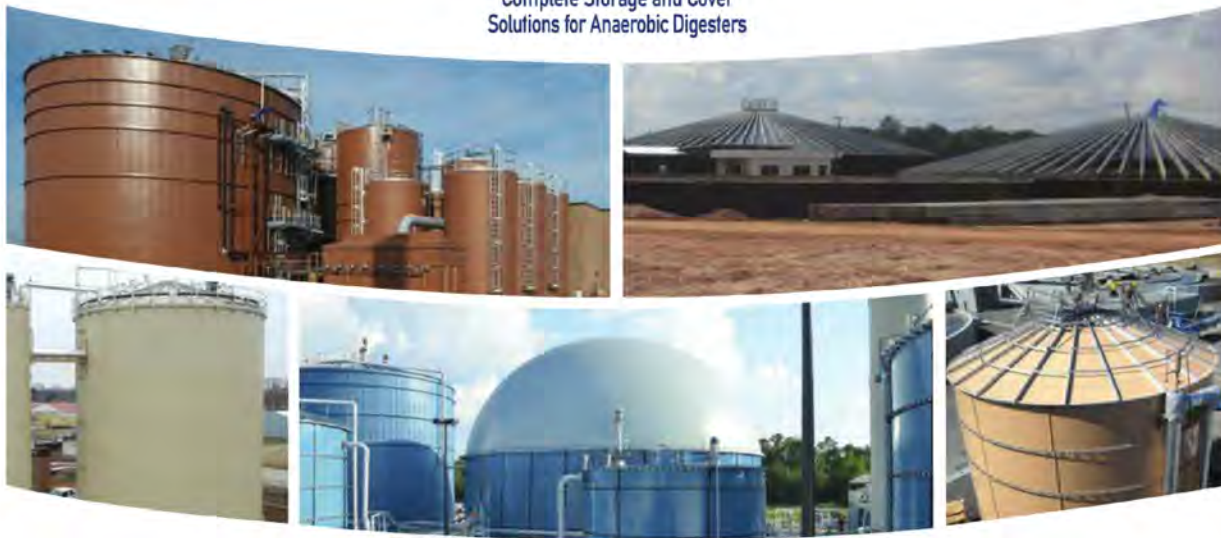
The facility produces 5.4 MW of

"We think it is the most technologically advanced biogas facility in the world. We are able to handle all the organics that municipalities generate — food waste, FOGs and biosolids from WWTPs — in a seamless, integrated way." — Paul Sellow, Harvest Power



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combined heat and power. “We are completely off the grid,” says Peters. It takes about 300 kilowatts to run the facility and the rest is sold back to RCID.

“We think it is the most technologically advanced biogas facility in the world,” Sellow says. “We are able to handle all the organics that municipalities generate — food waste, FOGs and biosolids from WWTPs — in a seamless, integrated way.”

GROWTH POTENTIAL

Sellow calls it an exciting time for organics saying the waste stream is “finally getting the attention that it deserves and needs.” He says he believes source-separated organics is the right approach because the same principal worked in building out the recycling industry.

“Our overall philosophy is to basically extract the maximum value out

Winning recognition

Waltham, Massachusetts-based Harvest Power has earned the American Biogas Council’s (ABC’s) inaugural Biogas Project of the Year Award for its Central Florida Energy Garden in Orlando, Florida.

The Project of the Year Awards recognize projects that make significant contributions to the biogas industry. The ABC Awards Committee says it selected the Harvest Energy Garden because it excelled in all criteria, particularly innovation, technology, collaboration and complexity.

“This facility signals a paradigm shift for the region’s hospitality industry as hotels and restaurants are now able to differentiate themselves to customers through environmentally sound waste recycling practices,” says Chris Peters, regional vice president of Harvest Power in Florida. “We’re excited to see organics recycling and clean energy take off in this region.”

Harvest Power is working with several partners in Central Florida, including the Walt Disney World Resort, JW Marriott, Waldorf Astoria, Republic Services, the Arnold Palmer Invitational and FreshPoint Central Florida among others.



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