

Turning Food Waste into Renewable Energy, a Business Opportunity

Melody Yuan | March 16, 2020



Anaerobic digestion provides a solution for food waste management and clean energy generation. (Photo credit): Gettyimages.com/ Johner Images and Organic Energy Solutions

In a race against time, how is California addressing food waste management and clean energy?

Did you know that the food that's gone bad in your fridge can help generate electricity for your community? As efforts to curb global warming have gotten stronger, the renewable energy industry has kicked innovation into high gear. Among the many renewable energy investments happening around the world, one that is entering the U.S. spotlight is anaerobic digestion. As of 2018, the U.S. now has more than 2,200 sites producing biogas across all 50 states, with 250 anaerobic digestors on farms, 1,269 water resource recovery facilities using anaerobic digesters, and 66 stand-alone systems that digest food waste.

According to the U.S. Department of Agriculture, approximately 30 to 40 percent of the nation's food supply goes to waste. This amounts to approximately 133 billion pounds and \$161 billion's worth of food. Much of it is distributed and put into landfills, which contributes to the release of greenhouse gases.

"As a society, we collectively generate so much food waste," says Don Danh, senior vice president and manager of emerging markets and clean tech at East West Bank. "Anaerobic digestion (also known as biodigestion) provides a solution for both food waste management and clean energy generation."

Advantages of turning food waste into energy

How does anaerobic digestion work? "[It] involves grinding up organic waste, putting it into some sort of hydrolysis tank so that the organic matter is divided from the fats, proteins and carbs, and the rest goes into an anaerobic digestion tank," explains Ken Edens, vice president and senior relationship manager of clean tech at East West Bank. "If you take organic waste and just dump it into a landfill, it

creates a lot of methane gas, which is a greenhouse gas that's 30 times more potent at trapping heat than carbon dioxide, and it gets released into the atmosphere. With anaerobic digestion, you can decompose the waste, kill the pathogens. And while the process still generates methane, that methane is captured, and you can either run it through a generator to produce electricity, or you can condition it and sell it as a natural biogas."

"Anaerobic digestion provides a solution for both food waste management and clean energy generation."

-Don Danh



(Photo credit): Organic Energy Solutions

Unlike other forms of renewable energy such as solar and wind, anaerobic digestion creates power 24 hours a day, seven days a week. This allows for continuity in power generation and has proven to be a cost-effective way to address multiple societal issues at once. While the process itself isn't new, anaerobic digestion as a renewable energy source has been gaining momentum, especially since California passed laws AB-1826 and SB-1383, which mandate for recycling commercial organic matter.

"Per the new laws, you can either use anaerobic digestion or composting to recycle," says Edens, "and to my knowledge, East West Bank is the first commercial bank to finance a food waste energy project in California. It's really exciting stuff, and investing in this niche is great, because we think California won't go back on their environmental laws and regulations, regardless of whether the rest of the economy is up or down." According to the 2017 California State Report, the state still needs about 14 million tons of additional processing capacity for organic waste, which makes this an industry with plenty of opportunity.

Organic Energy Solutions, the company leading the way

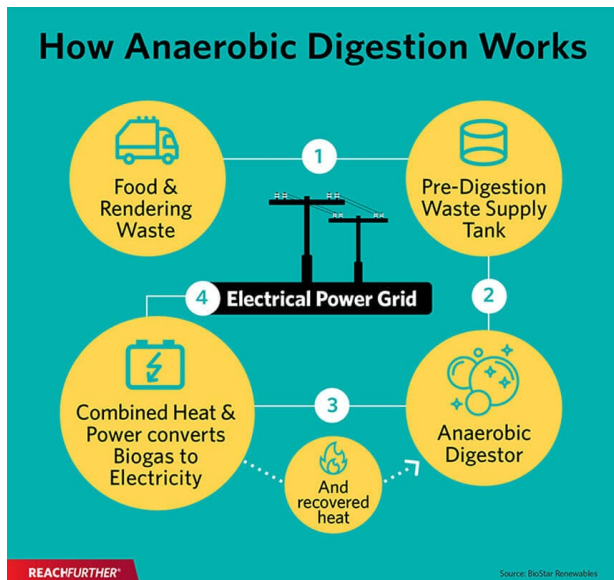
As part of the San Bernardino Waste-to-Energy project in 2020, Organic Energy Solutions will be leading the way in diverting food waste from going into landfills.

"We [Organic Energy Solutions] dispose 85,000 gallons of organic waste a day, which amounts to about 31 million gallons of food waste per year," says Sergio Perez, president of Organic Energy Solutions. "This volume of processing waste will create almost 22 million kilowatt hours of electricity, which is enough power to supply 2,000 homes and generate more than 19 million gallons of clean water for industrial use—not to mention, it also creates 849,000 gallons of liquid fertilizer per year."

Recycling organic matter and converting it into energy has been practiced around the world for centuries, but the process had seen little momentum in the U.S. According to Waste Today Magazine, in 2014 Germany had 9000 anaerobic digestive systems installed, whereas the U.S. only had about 200.

“You know, Europe in general is ahead of us by about 20 years,” says Perez. “I think our challenge in America is that we have a lot of space, so we’re not as concerned with diverting waste from a landfill because we take it out to the desert where nobody sees it. It’s a lot easier and a lot cheaper to pile it up in the middle of nowhere, whereas Europe has run out of landfill space for about 50 years now.”

Organic Energy Solution’s technology comes from contracting with a French company called Suez that has a patented mixing system specifically for biodigesters. “The biggest challenge for biodigesters is having the heavier solids fall to the bottom of the tank and not mix well,” says Perez. “You don’t want dead spots in the tank, because with that kind of build-up, you lose capacity inside the tank and then you create less gas.”



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How anaerobic digestion works

Starting a renewable energy company

When it came to finding a solution to food waste and clean energy, Perez and his partners were ahead of the curve. “Organic Energy Solutions officially began in 2014, but I’ve had this idea for several years now,” says Perez. “Back in the ‘90s, I was already operating a food industry wastewater company, and in the early 2000s, we started removing food particles from water and taking it to the municipal biodigester in Riverside to help them generate electricity. And I thought to myself, wouldn’t it be great if we could do this our own way with our own biodigester?”

As the emphasis on climate change grew stronger, Perez pushed harder for anaerobic digestion. “In 2010 when we were trying to put everything together, there were no laws mandating that food waste needed to be recycled. We simply wanted to do it because we thought it would be good for the environment,” he says. “We were finally able to purchase a warehouse in 2012 and were given a permit in 2015.”

With many moving parts, it took time for things to align and the gears to turn. “When you’re trying to build any type of alternative energy project, you need multiple partners to help. From having good technology and building a solid foundation, to having reliable sources to provide you the waste—and let’s not forget how important it is to have a good financial institution that backs you up,” says Perez. “You need all of these partners’ commitment and support to get up and running.”

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(Photo credit): Organic Energy Solutions

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How to establish and incorporate renewable energy sources

Anaerobic digestion may be beneficial in multiple ways, but when it comes to establishing anaerobic digestion sites, the concept doesn't sound as appealing to nearby residents.

“Public perception is the biggest challenge for any company that deals with waste,” says Perez, “and we were no exception.” Most people, Perez explains, were concerned about the smell of the food waste permeating into neighborhoods, but others were also concerned about potential tank leakages, property values declining and potentially more traffic.

“There were all sorts of opposition, so our biggest task was to show the community and leadership in the city of San Bernardino that having us operate here would be a great benefit,” says Perez. He adds that there are no foul smells that would emanate from the plant, because everything is contained.

Motivating the community to welcome Organic Energy Solutions projects didn't happen overnight. But eventually people began to come around after many meetings with city officials and speaking to the public. “Having an anaerobic digestion plant is something to be very proud of, because it shows that the city is participating in being environmentally responsible in diverting food waste,” says Perez. “It was smoke and mirrors for them at first, and it took a while to get them to understand the benefits, which is why permitting alone took us almost three years.”

With support from East West Bank in financing the construction and operational costs, Organic Energy Solutions has successfully demonstrated its capability in generating energy. “Biodigestion is expensive, and you need to prove to financial institutions that you have the right technology and the resources to maintain steady operations,” says Perez. “That's usually a big challenge for renewable energy companies and projects, but East West Bank has just been awesome at seeing the big picture. Don and Ken have educated themselves in our industry, and they understand exactly what we're doing. That's the kind of support we need.”

Organic Energy Solutions' rate of success—along with backing from government entities such as CalRecycle and policies that have now been established—indicates support for anaerobic digestion as a potential solution to food waste. The demand for processing more organic waste in California has cranked Organic Energy Solutions' business into high gear.

“California estimates that we'll need another hundred biodigesters in the next 10 years,” says Perez. “So, we definitely want to build more plants, and our goal is to have three, four, or maybe even five biodigesters in the Southern California region.”

Perez is confident that the U.S. will soon catch up to Europe's anaerobic digestion technologies. "California has helped the U.S. turn a corner, and we're now seeing states like Washington, Oregon and Arizona following in its footsteps," he shares.

On a more individual level, Perez says we can all cut down on food waste by asking how much food we are actually consuming versus how much is going to waste. "All of us ought to be responsible for where our waste goes, so we should be asking ourselves: Where is the waste that I generate going? Is it being diverted or recycled?" he says. "And if you aren't investing in companies that are creating renewable energy, perhaps it'll be a good thing to do so."