

With CT's trash future in flux, food-waste recycler hopes for bigger role



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An outside view of Quantum Biopower's Southington anaerobic digester, which remains the sole such facility in Connecticut, despite efforts by policymakers to incentivize further investment in the organics-recycling technology.

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Processing facilities that convert food and other organic waste into energy and compost are a key piece of Connecticut's strategy to reduce the amount of garbage it burns, but investment in those plants has fallen well short of what is needed to meet the state's goals.

Connecticut's only anaerobic digester, run by Quantum Biopower, opened four years ago in Southington, but not much has happened since.

Several other proposed digester projects have stalled out due to financial troubles or other challenges, and state incentives have thus far failed to attract investment in more plants.

Quantum can process about 40,000 tons a year, which is well short of the 300,000 tons of annual digester capacity state environmental officials say is needed to divert a meaningful volume of organics from the broader waste stream by 2024.

Despite the lackluster performance, there are reasons to believe things will pick up.

Other states are starting to see renewed interest in building anaerobic digesters, including from deep-pocketed private equity backers.

For example, Maryland-based Bioenergy DevCo is using a \$106-million investment from Newlight Partners to build a 100,000-ton capacity anaerobic digester in its home state, while also proposing facilities in New York, New Jersey and Washington.

Investment in such plants is spurred by various regulatory and market dynamics, including California's financial incentives for biomethane — also known as renewable natural gas — which can be produced by in- and out-of-state anaerobic digesters. There's also growing demand from private companies like UPS that want the fuel for their natural gas-powered vehicle fleets. And states like Connecticut have mandates that require large food-waste producers, such as grocery stores and manufacturers, to separate their organics and ship them to composters or anaerobic digesters.

“Anaerobic digestion has a bright future, but it's more a question of timing,” said Brian Paganini, Quantum's vice president and managing director.

Meanwhile, the cost of getting rid of garbage is only rising, which promises to spur greater interest in removing more of the 500,000 tons of food and organics that end up in Connecticut's waste stream each year.

The state's largest waste-to-energy plant, which burns one-third of Connecticut's garbage, is on its last legs.

Dozens of municipalities that send their trash to Hartford's aging Mid-Connecticut plant recently deemed a \$330-million redevelopment plan for the facility to be too costly, throwing the project — and the state's overall waste-management strategy — into uncertainty.

If that redevelopment doesn't happen, Connecticut will likely send far more of its garbage to out-of-state landfills.

“We need to let some pressure out of the balloon and give our waste system a bit of a rest,” Paganini said. “A great way to do that is to unlock the organic load that is in our garbage.”

Gabrielle Frigon, a supervising environmental analyst at the Department of Energy and Environmental Protection (DEEP), said the agency plans to revisit and update its waste strategy in the next 18 months, but anaerobic digestion remains a priority, as does the desire to limit landfilling.

“I believe we are still very supportive of anaerobic digestion,” Frigon said. “We need the capacity and we need the buildout of composting facilities, whether aerobic or anaerobic.”

Connecticut has provided various incentives to encourage development of anaerobic digesters.

The state has placed the technology into its highest tier of renewable energy generation, alongside solar and wind, allowing digester owners to receive valuable energy credits they can sell.

Connecticut has also carved out millions of dollars in utility bill credits for farms that have digesters, and more recently, has allowed digesters to bid for long-term renewable energy power purchase contracts directed by the state.

Pipeline prospects

In anaerobic digestion, microorganisms break down waste in an oxygenless environment, producing natural fertilizer as well as a mixture of methane and carbon dioxide called biogas.

Many digester operators use that gas to produce electricity that can be used or sold.



Brian Paganini, Vice President and Managing Director, Quantum Biopower

That's the case at Quantum, which uses some of the energy on-site, but sells the bulk of it to the town of Southington to help power various municipal buildings.

Quantum is exploring a potentially more profitable way to use the biogas: purifying it to utility standards and injecting it into the natural gas pipeline.

Gas utilities in California started accepting biomethane in 2018, and even out-of-state producers can qualify for the above-market incentives in that state's Low Carbon Fuel Standard program, which issues tradeable energy credits that have spiked in value over the past few years as fuel standards there have grown stricter.

While California leads the pack on biomethane, Oregon recently created its own low-carbon program, and other states may follow suit, Paganini predicts.

"More [low-carbon] programs will be popping up in the future," he said.

Biomethane may be on the horizon in Connecticut.

Last year, Quantum successfully lobbied state legislators to order utility regulators to develop quality and interconnection standards for biomethane that can be injected into the natural gas distribution system. The Public Utilities Regulatory Authority has a Sept. 2021 deadline to finish that task.

Paganini said that producing pipeline quality biomethane would require Quantum to invest approximately \$3 million in new technology. The company is evaluating the opportunity.

"There is definitely thought about it," he said.

It would likely be a more profitable use of the plant's biogas, though connection costs and other factors could impact the math, he added.

Supply needed

Connecticut was the first state in 2014 to mandate the removal and separate recycling of organic waste from large commercial producers' trash streams.

The law originally applied to any operation producing 104 tons or more of food waste per year, so long as it was within 20 miles of a processing facility. Starting this year, the rules began applying to producers of 52 tons per year or higher.

It's unclear how many additional businesses are now subject to the rules, but Paganini said Quantum, which has 51 customers, has not yet seen any major increase in demand.

He suspects some businesses aren't following the rules, and he wants the state to step up enforcement, perhaps by adding fines for noncompliance.

DEEP has taken a softer approach that Frigon calls "compliance assistance."

"We have inspectors who go out and discuss the benefits of organics diversion with the producers," Frigon said. "The process takes an understanding on the part of the generator that they could save money and be environmentally friendly."

Beyond adding some teeth to the organics mandate, a larger step would be expanding it to residences.

That would involve each home having a dedicated organics container, the contents of which haulers would collect at the curb along with recyclables and trash.

"The residential side is the next frontier for food waste," Paganini said.

Such rules would likely spur more investment in anaerobic digesters, as investors could be certain that there would be an adequate supply of organic fuel.

"These facilities live and die on volume coming into the front door," he said. "We need a hard and fast, stringent diversion mandate."

Any such mandate would have to come from the legislature, but Frigon said DEEP supports the concept.

"The department supports any efforts toward food-waste diversion," she said. Pilot programs in the state have shown that it can be a challenge for residents to make it a habit to separate their organic waste.

"I think the challenge is consistency," she said.

The other hurdle is contamination. Just like some residents throw plastic bags or other nonrecyclables into their single-stream bins, some people will inevitably toss waste that is not compostable into their organics bins, she said.

What's in Connecticut's municipal solid waste stream?

Food waste and other organics make up nearly 800,000 tons of Connecticut's annual municipal solid waste. The state has been working to divert those materials ahead of time.

Category	Tons
Paper	539,493
Food waste	519,832
Other wastes	291,940
Construction debris	276,995
Plastic	275,613
Other organics	258,922
Metal	82,443
Glass	58,512
Household hazardous waste	16,943
Electronics	11,906
Total	2,332,599

Source: DEEP, 2015 waste survey