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NYC wastewater plants turn compost into power

By Matt Tomich

New York isn't on track to meet its clean energy and sustainability goals. A new biennial review finds we will fall far short of the State's mandated targets of getting 70% of electricity from renewable sources by 2030 (we're currently around 29%) and 100% from emissions-free sources by 2040.

To get there we'd need to triple renewable generating capacity in the next 5-6 years, which isn't happening. Recently some big renewable projects were canceled, and Manhattan congestion pricing was put on hold indefinitely, which will mean higher carbon emissions for longer.

Meanwhile, New York City is nowhere near achieving its Zero Waste goal of sending no waste to landfills by 2030, which will mean higher methane emissions for longer. More than a third of the city's waste stream is organic. NYC residents discard 600,000 tons of food each year; only about 4% is put to productive use. Most of the rest is landfilled, where it decomposes and generates methane biogases that warm the planet.

In this bleak outlook, two bright spots are curbside collection of organic waste starting citywide this month, and the City Council and Mayor Adams agreeing to restore $6 million in the city's FY25 budget for community composting of some of that waste.

The restored city budget item will fund established community composters like GrowNYC, and smaller ones like microhauler Bk Rot and The Brotherhood Sister Sol, which operates a community garden in Manhattan.

Community composters are a great alternative to landfilling, but they can only handle a slice of the city's organic waste stream. Even with some of it going to Staten Island and New Jersey, there isn't enough capacity to compost it all. And some food waste -- fats, oils, grease, meat, fish, dairy – aren't compostable. So we need places besides landfills to put all the organic waste that isn't composted. Fortunately, we have them: the city's wastewater plants.

For example, 80% of waste collected in NYC household organics bins in Queens and Brooklyn and in smart composting bins around the city goes to the city's largest wastewater treatment plant: Newtown Creek in Brooklyn. There NYC's Department of Sanitation and Department of

Environmental Protection worked with National Grid and Waste Management on a recently completed "gas-to-grid" retrofit that enables the plant to convert organic waste together with sewage into renewable energy. Airtight tanks called anaerobic digesters process the waste and capture the methane biogas they emit as they decompose. Nearby facilities refine that biogas into renewable natural gas (RNG), a sustainable fuel injected into existing natural gas pipelines, becoming part of the energy grid powering homes and businesses. The solids left in the digester tanks make high-quality soil amendments similar to compost. At full capacity, Newtown Creek can handle 500 tons of food waste daily, 13% of NYC's entire organic waste stream.

The project had start-up problems, including long construction delays. Extended outages during the first six months of operation meant methane-rich biogases were regularly "flared" or burned off instead of being used as renewable fuel. That drew the ire of local environmental justice and citizens groups -- the same groups that fought for the project for nearly a decade. But their advocacy and watchdogging were crucial to Newtown Creek's ultimate success (it's now operational 92% of the time – up from 44% last year) and part of what could make the wastewater gas-to-grid model replicable.

It urgently needs replicating. If other NYC wastewater plants used the gas-to-grid approach, together they could divert at least a third of New York's organic waste from landfills and convert it into renewable energy and fertilizer. New digesters under construction at Hunts Point in the Bronx will be able to process another 250 tons of food waste daily starting in 2026. If we built additional gas-to-grid projects at other NYC plants, the city's wastewater system could process 1,000 tons a day by 2031.

That would cut greenhouse gas emissions from NYC government operations 15% and save the city up to $72 million annually. We'd avoid methane emissions from landfilling the waste, generate enough ultra-low carbon RNG to displace over 25 million gallons of diesel fuel annually, and produce high-quality soil amendments to supplement what community composters can produce.

There's more than enough food waste to go around. By themselves, neither community composting nor retrofitting wastewater plants can handle it all. But together, they could put New York City's organic waste stream to productive, symbiotic uses that get us closer to clean energy and Zero Waste goals.

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