

The Circular Economy Hub at Newtown Creek WRRF

Northeast Recycling Council Co-Digestion Webinar

October 20, 2025



The New York City Department of Environmental Protection (DEP) is tasked with enriching the environment and protecting public health for all New Yorkers.

Water Supply

- Deliver 1.1 billion gallons of water to over 8 million New Yorkers everyday

Wastewater Treatment

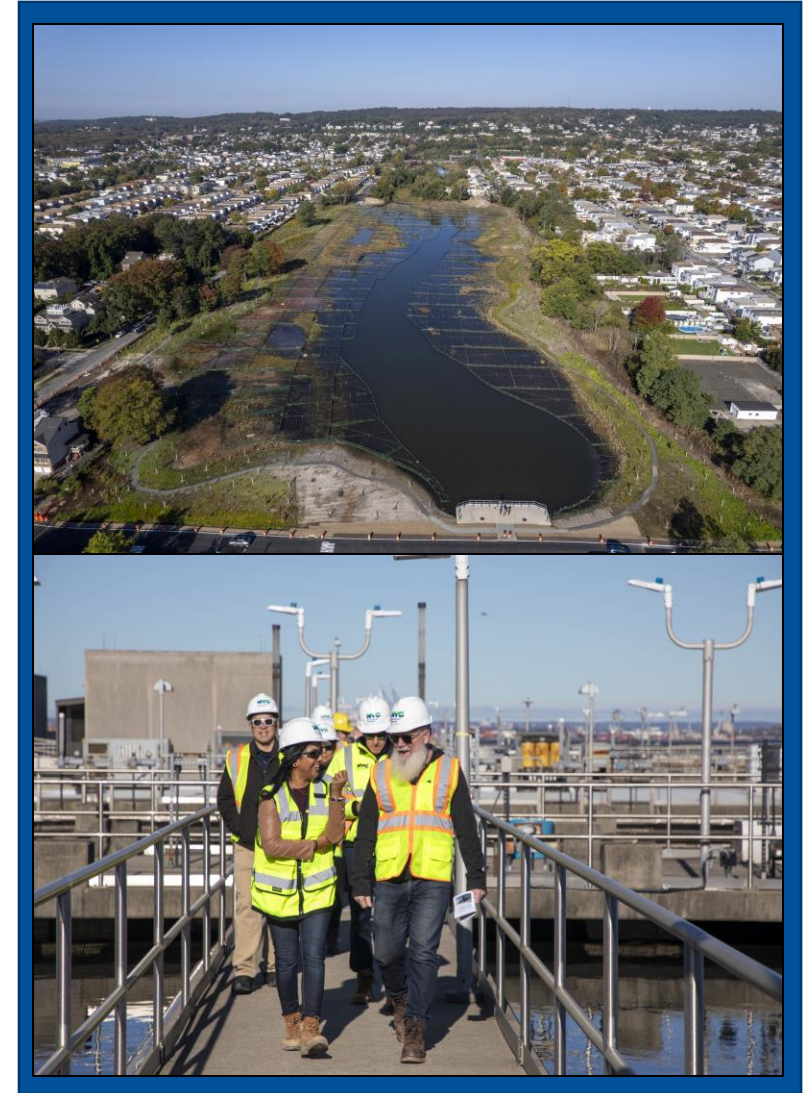
- Treat 1.3 billion gallons of wastewater daily
- 7,500 miles of sewers
- 96 pumping stations
- Own and operate 14 in-city WRRFs
 - 75 Digesters

Resiliency

- Manage City's coastal resiliency planning and implementation of green infrastructure to mitigate stormwater flooding

Air, Noise, and Hazardous Waste

- Enforce the NYC Air Pollution Control Code to reduce local emissions, enforce the NYC Noise Code, and regulate hazardous waste



NYC DEP is committed to deep decarbonization and a circular economy

Combination of mayoral directives and executive orders, Climate Mobilization Act of 2019 mandates, and DEP Strategic Plan goals

1. Municipal greenhouse gas (GHG) emissions reductions from a Fiscal Year 2006 baseline:
 - a) 40% by 2025
 - b) 50% by 2030
 - c) 80% by 2050
2. Energy-neutral WRRFs by 2050
3. Zero biosolids to landfill by 2030
4. Achieve a Circular Economy



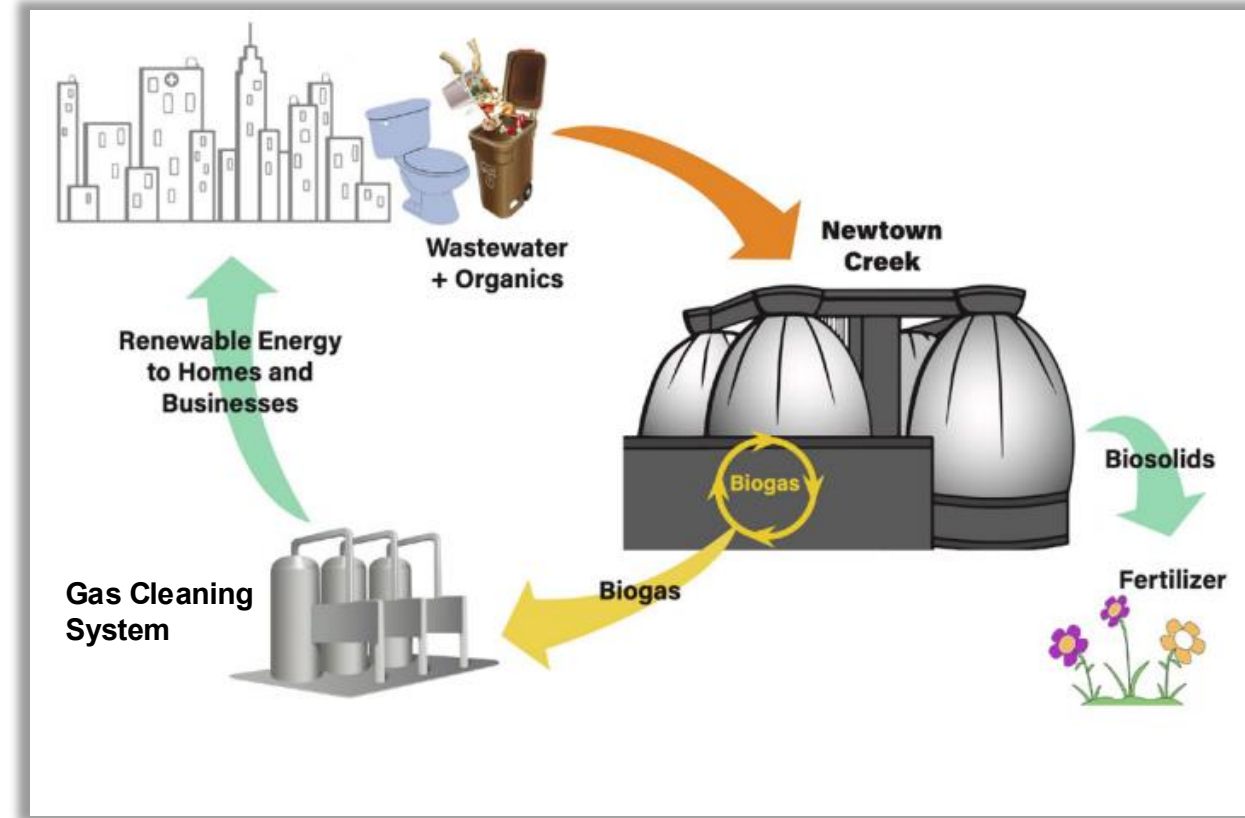
The Circular Economy Hub at Newtown Creek



Newtown Creek WRRF is the City's first facility to export RNG created from wastewater and food scraps

- **Waste Management** delivers around **200-250 tons per day** of **pre-processed food scraps** to Newtown Creek WRRF
- **Co-digestion** is the process of digesting food scraps, or other organics, alongside sludge
- **Biogas-to-grid** refers to the process of upgrading biogas to Renewable Natural Gas (**RNG**) and exporting it to the gas pipeline
- **National Grid** creates **RNG** on-site using a **gas cleaning system**

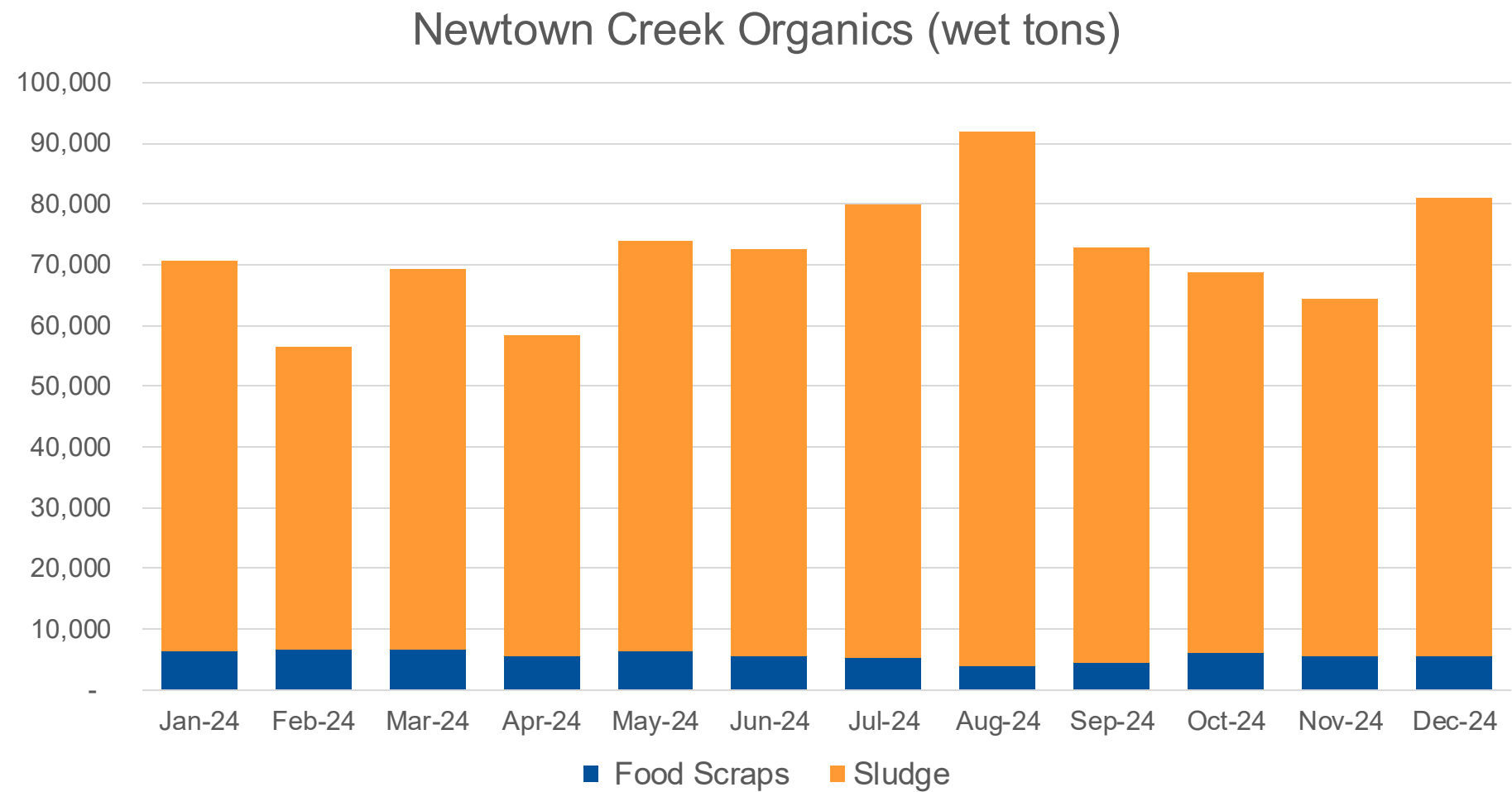
Circular Economy Hub at Newtown Creek WRRF



Food scraps must be collected, pre-processed, and delivered to DEP prior to digestion and conversion to RNG



DEP processed almost 70,000 wet tons of food scraps and nearly 800,000 wet tons of sludge in 2024 at Newtown Creek WRRF



Drivers for Co-digestion



JUST DO IT. 

Co-digestion plays a pivotal role in managing NYC's source separated organics

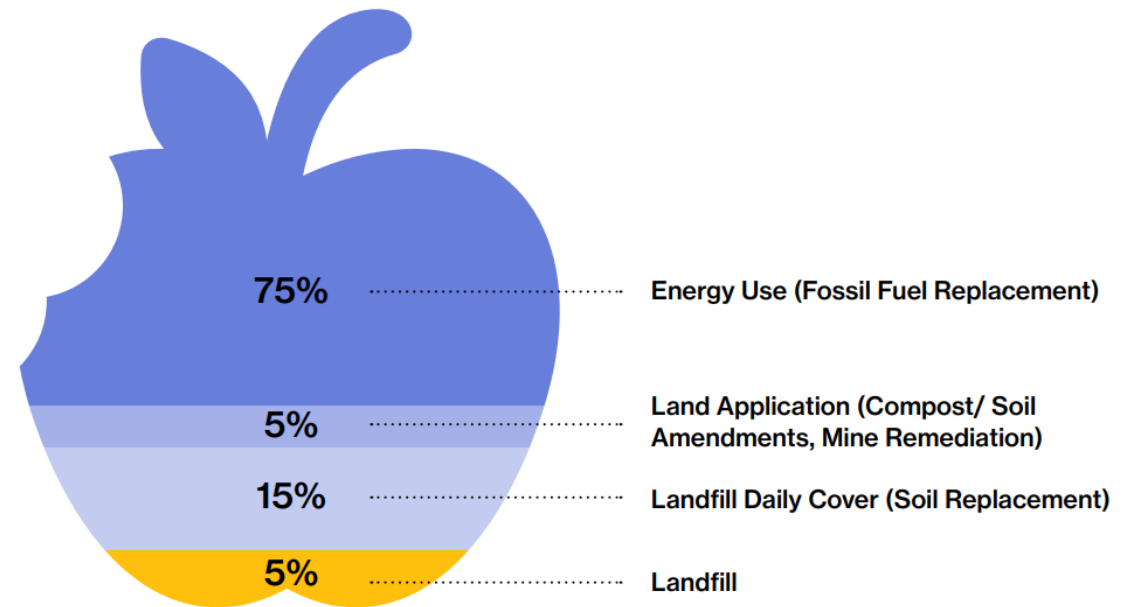
- **NYC produces around 4,100 metric tons per day of organic waste**
 - Approximately **1/3** of NYC's municipal solid waste is **organic**, including food scraps, yard debris, and restaurant grease
- **NYC has rolled out the largest curbside organics collection program in the nation**
 - All NYC residents have access to free curbside organics collection
- **NYC Commercial Organics Rule** requires certain large-scale businesses to separate organics
 - Expected to expand to cover all commercial businesses by 2026



The vast majority (95%) of food scraps and other organics received for co-digestion are beneficially or productively reused

- Food scraps convert readily into biogas during anaerobic digestion
 - Higher biogas yields than wastewater sludges
- Biosolids are a nutrient rich resource and are a valuable soil amendment
 - Most of DEP's biosolids receive additional treatment off-site prior to land application
 - Processes include composting, thermal drying, and alkaline lime stabilization
 - Biosolids are commonly used for landscaping, agriculture, and mine reclamation/ecosystem restoration

Co-digested organics at Newtown Creek WRRF in 2023



The circular economy hub at Newtown Creek WRRF generates renewable energy and reduces greenhouse gas (GHG) emissions

2024 RNG Production and GHG Emission Reductions

Renewable Energy:

- RNG is a direct replacement for fossil natural gas

Emission Reductions:

- Diverting food scraps from landfills reduces emissions of methane, which is a potent GHG



RNG Produced: 274,200 MMBtu

- Enough to meet the annual heating needs of **5,700 homes**



CO₂e emission reductions: 28,200 mt

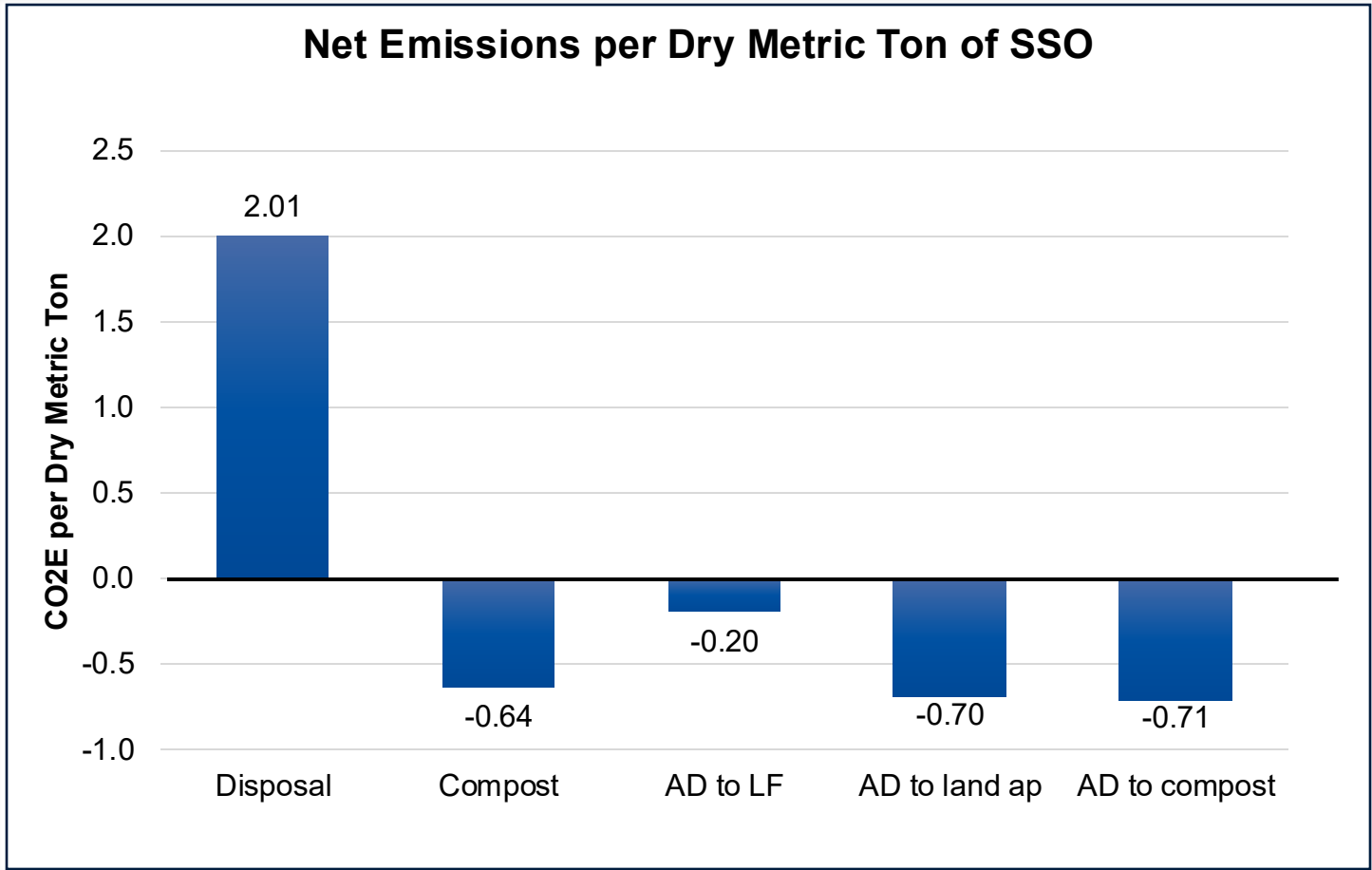
- Sequestration potential of:
 - Planting **466,000** trees
 - **71** Central Parks



CO₂e emission reductions: 28,200 mt

- Equivalent to emissions of:
 - **6,700 cars** driven for one year
 - **Over 3 million** gallons of **gasoline**

The carbon footprint of anaerobic digestion (AD) is comparable to composting



Source: Northern Tilth, 2023

BioCycle Article:
Modeling GHG
Emissions From
Source Separated
Organics

A QR code is located below the article title, which likely links to the full article mentioned in the text.

DEP has committed extensive resources to mitigate fugitive methane emissions

- DEP conducted field surveys across our 14 in-city WRRFs to detect fugitive methane emissions. From the detection surveys:
 - Many identified deficiencies were quickly resolved by the facility or added to scopes of existing capital projects slated for implementation
 - Items that required a capital investment were scoped and are being contracted for fast-tracked in-kind replacements and upgrades
 - Over \$27 million has been allocated to these measures
- DEP is seeking to have resources dedicated for routine detection, measurement, and upgrades to gas-handling infrastructure

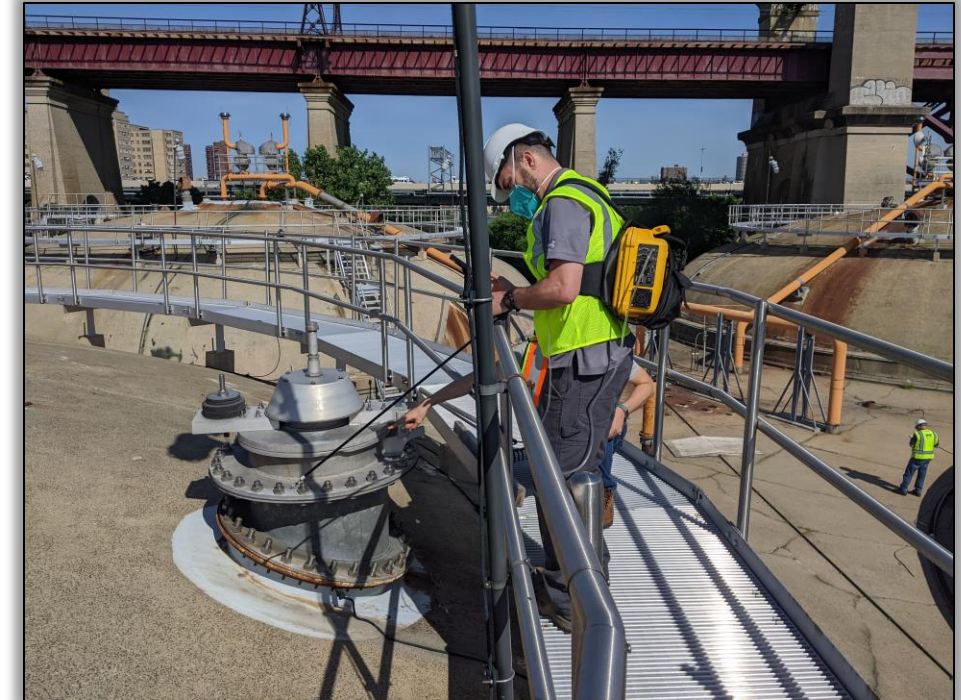


Figure: Leak detection survey at DEP's Wards Island WRRF

Co-digestion and composting are complimentary solutions to recycle NYC's organic material



- **Co-digestion** uses existing infrastructure to quickly process large volumes of organic material

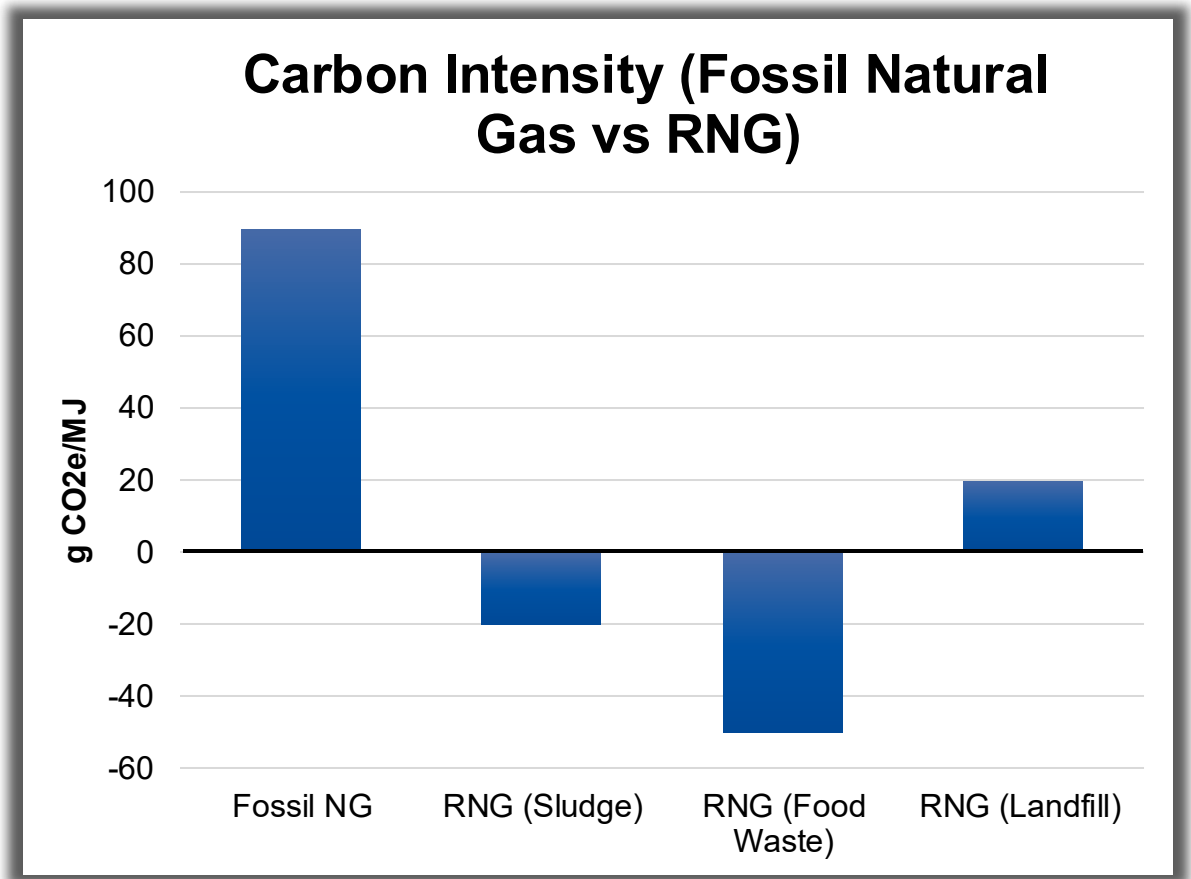


- **Composting** effectively recycles food scraps, yard waste, and woody debris into a nutrient-rich soil amendment
 - Can be implemented at different scales

Characteristics	Co-digestion	Composting
Suitable Organics	Food Scraps including Meat & Dairy, FOG	Food Scraps, Yard Debris
Ability to Address Contamination	Very Effective	Limited to Large-scale Facilities
Community Benefits	Reduces Local Air Pollution in Tandem with Gas-to-grid	Provides "hands-on" Educational Opportunities and Can Support Community Gardens
Footprint	Small (vertical process)	Large (horizontal process)
Time Frame	15-30 Days	3-6 Months

Directing RNG to hard-to-electrify users is the most sustainable way to utilize DEP's biogas

- Certain **industrial processes** require high temperatures that **cannot yet be electrified**
- **RNG** from **sludge** and **food waste** has a **negative** carbon intensity
- **Not all RNG is created equal:**
 - Distinction between unavoidable waste and intentional feedstock production
- On-site **air pollutant** and **GHG** emissions are **reduced** when biogas is upgraded to **RNG** and exported to the pipeline



Source: Argonne National Laboratory

Key Takeaways



- A local outlet capable of managing large volumes of material helps ensure the success of NYC's residential and commercial organics collection programs
- Co-digestion is especially well suited for urban areas
 - Many wastewater utilities already operate anaerobic digesters
 - Urban areas generate significant volumes of food scraps and FOG
 - Pre-processing equipment effectively handles high levels of physical contamination
- RNG production from waste-derived feedstocks can complement electrification efforts in achieving decarbonization goals

Thank you!

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Questions?

