

Executive Summary



People and policies are the barriers to implementing energy projects – not the science

Assessing the Benefits and Costs of Anaerobic Digester CHP Projects in New York State (ENER7C13e)

The Central Issue

Although several anaerobic digestion (AD), biogas utilization, and co-digestion projects have been successfully commissioned in recent years, many potential New York State (NYS) sites remain undeveloped or underdeveloped. Despite significant financial and programmatic support from the New York State Energy Research and Development Authority (NYSERDA), relatively few NYS wastewater utilities move forward with anaerobic digestion and biogas utilization projects.

Context and Background

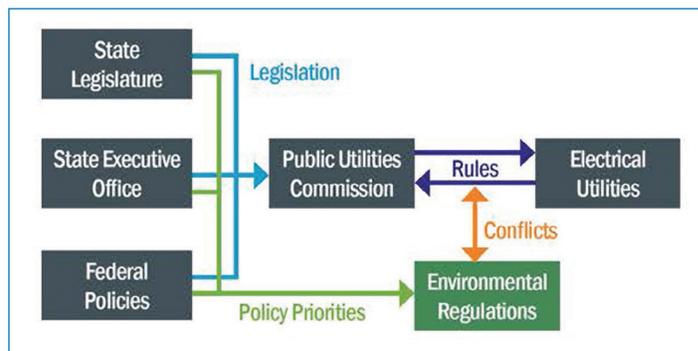
The researchers sought to address the following questions:

- What makes AD projects attractive?
- What drives the economics of AD projects?
- Are sufficient benefit/cost analysis tools available and used by wastewater utilities?
- Which risk factors are prominent and what are potential means to overcome those risks?
- Can environmental benefits be monetized through incentives?
- Based on current conditions, what are the best financing/funding approaches for municipal wastewater utilities pursuing biogas utilization projects?
- Are there regulatory or other barriers that might be changed or other features that the NYS government could employ to further reduce hurdles to wastewater biogas projects?

Findings and Conclusions

The researchers found that these risks deterred wastewater utilities from proceeding with combined heat and power (CHP) projects:

- Economic factors – Projects stalled from lack of economic feasibility.
- Biogas quantity – Concerns about whether they would have enough biogas to ensure project viability.
- Staffing – Concerns about whether operations and maintenance requirements would undermine project financial viability, divert staff from other functions, or be higher than expected because of union contract provisions.



The regulatory entities and processes that affect biogas energy projects.

The lack of economic feasibility stemmed from electric power tariff provisions that erode savings from energy projects (i.e., demand charges, high fixed fees, and standby fees). States like New York can pursue approaches to increase the value of biogas and maximize cost savings through pursuit of favorable agreements with electric power providers to optimize the savings realized through reduced electrical consumption. They can develop a standard financial approach for water resource recovery facilities (WRRFs) to evaluate the economic viability of CHP projects, including environmental and social benefits not readily monetized.

Management and Policy Implications

This research provides WRRFs an explanation of the complex network of barriers to advancing CHP projects. It identifies the value of collaboration in states where they set and approve the electric tariffs for industrial users like water utilities. It emphasizes the importance for the water service sector in each state to develop a coordinated approach to inform and influence energy policies.

Related WE&RF Research

Project Title and Number

Research Focus

A Guide to Net-Zero Energy Solutions for Water Resource Recovery Facilities (ENER1C12)

Provides an evaluation of modeled, typical WRRF energy balances, and the opportunities for wastewater facilities over 5 mgd to become net-energy neutral.

Identification of Barriers to Energy Efficiency and Solutions to Promote These Practices (ENER7C13)

Informs the wastewater sector about barriers and impediments to energy efficiency and recovery projects and provides solutions to help direct policymakers' actions to improve energy management in the domestic wastewater service sector.

Current Energy Position of New York State Wastewater Treatment Facilities (ENER7C13a)

Provides a comparison of the energy demand at New York WRRFs over a decade when the installation of nutrient removal processes and plants operating below capacity are found to offset the progress in power consumption reduction made by energy efficiency and recovery initiatives.

WaterWatts: A Modern Look at Wastewater Power Metering Data (ENER15C15)

Provides an analysis of disaggregated power metering data by process at water resource recovery facilities, including BNR plants with the intent to identify factors influencing energy consumption at WRRFs.

Barriers to Biogas Use for Renewable Energy (OWSO11C10)

Documents barriers to the utilization of biogas for energy recovery using anaerobic digestion with combined heat and power generation. Includes case studies and a factsheet.

Reframing the Economics of Combined Heat and Power Projects: Creating a Better Business Case Through Holistic Benefit and Cost Analysis (OWSO11C10a)

Examines life-cycle metrics for decision making to evaluate the energy benefits over the project life of long-lived wastewater assets.

Principal Investigators:

Nancy Andrews, P.E.
Brown and Caldwell

Project Team:

John Willis, P.E., BCEE
Colin O'Brien
Lloyd Winchell, P.E.
Chris Muller, Ph.D., PE.
Brown and Caldwell



To order: Contact WE&RF at 571-384-2100 or visit www.werf.org and click on Search Research Publications & Tools. **WE&RF subscribers:** Download unlimited free PDFs. **Non-Subscribers:** Charges apply to some products.

Refer to Stock No.: **ENER7C13e**
For more information, contact
Lauren Fillmore at lfillmore@werf.org