Clean Energy Generation Opportunities in New York WWTP's

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DOE CHP Technical Assistance Partnerships (CHP TAPs)

<u>End User Engagement</u>

- Partner with strategic End Users to advance technical solutions using CHP as a cost effective and resilient way to ensure American competitiveness
- Utilize local fuels and enhance energy security. CHP TAPs offer fact-based, non-biased engineering support to manufacturing, commercial, institutional and federal facilities and campuses.

<u>Stakeholder Engagement</u>

- Engage with strategic Stakeholders, including regulators, utilities, and policy makers, to identify and reduce the barriers to using CHP to advance regional efficiency.
- Promote energy independence and enhance the nation's resilient grid. CHP TAPs provide fact-based, non-biased education to advance sound CHP programs and policies.

www.energy.gov/chp

<u>Technical Services</u>

- As leading experts in CHP (as well as microgrids, heat to power, and district energy) the CHP TAPs work with sites to screen for CHP opportunities as well as provide advanced services to maximize the economic impact and reduce the risk of CHP from initial CHP screening to installation.

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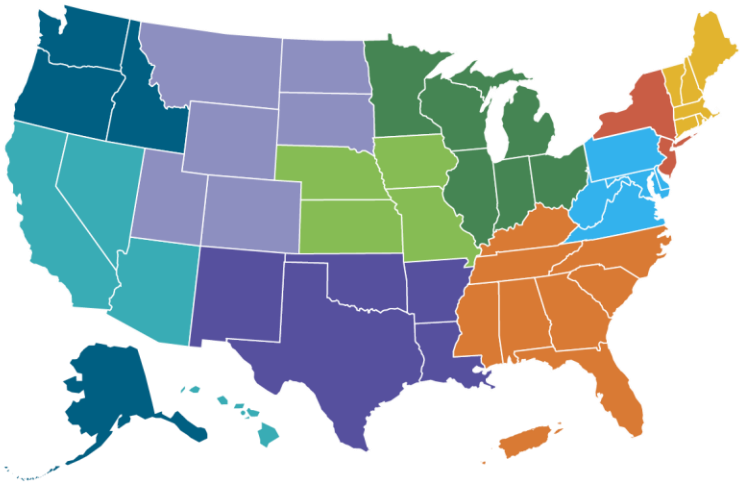

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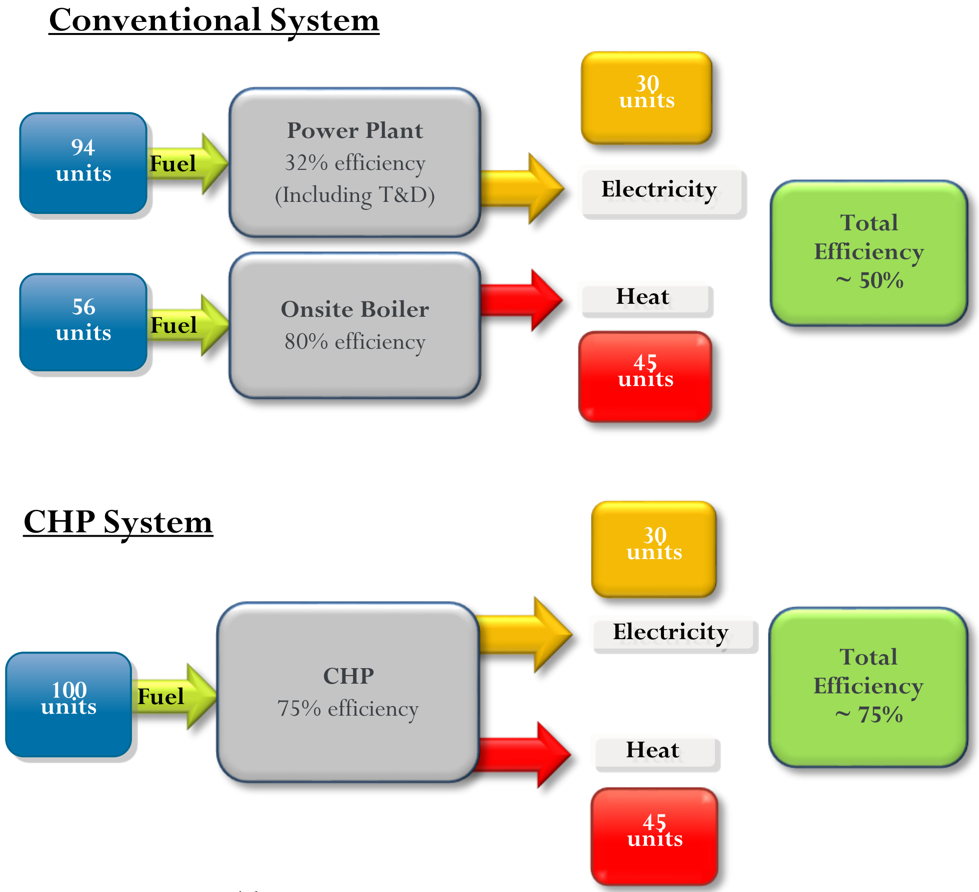
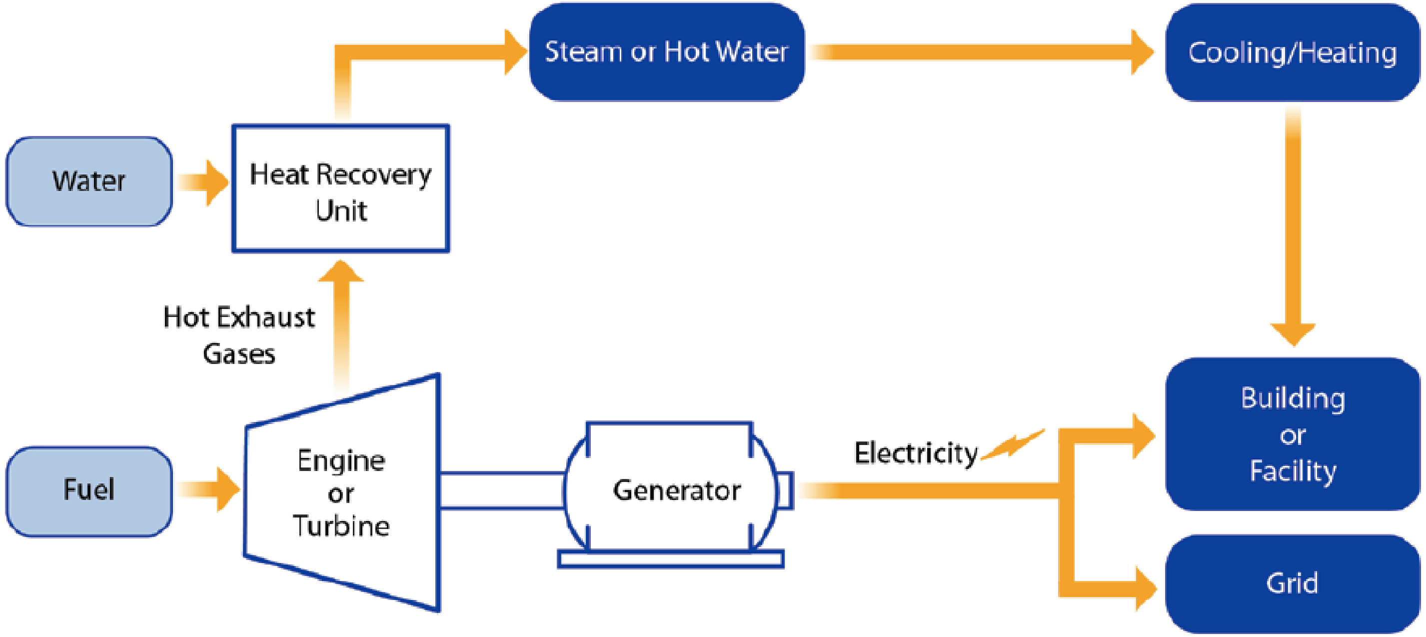
What Is Combined Heat and Power (CHP)?

- Form of Distributed Generation (DG)
- An integrated system
- Located at or near a building / facility
- Provides at least a portion of the electrical load and
- Uses thermal energy for:
  - Space Heating / Cooling
  - Process Heating / Cooling
  - Refrigeration/Dehumidification



Source: *www.energy.gov/chp*

CHP System Components



- Prime Mover
- Heat Recovery
- Thermal Technology
- Accessory Devices
- Switchgear
- Interconnection
- Fuel Supply
- Controls/M&V

CHP TAP WWTP Analysis

Plant Energy Use

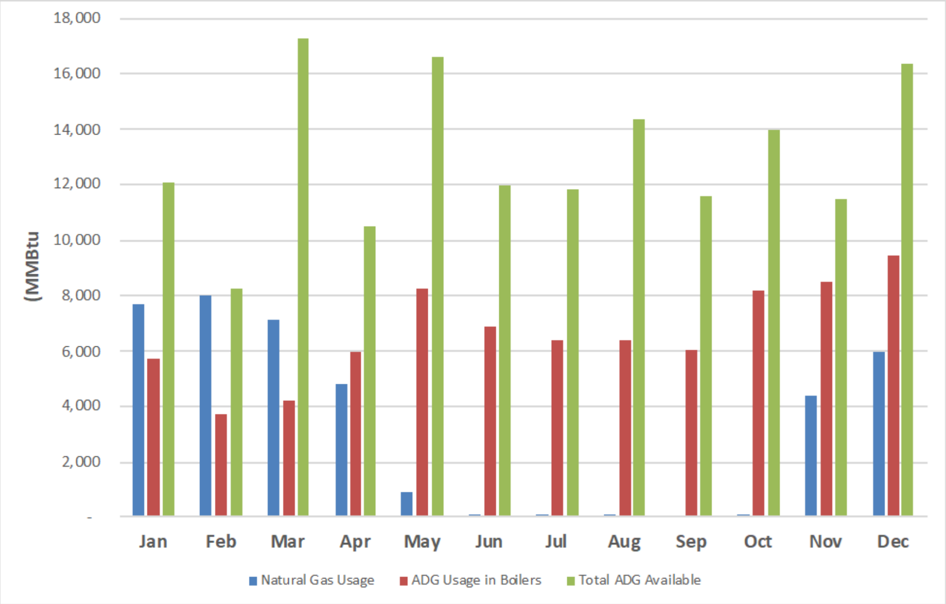
Electricity: 64,000 MWh

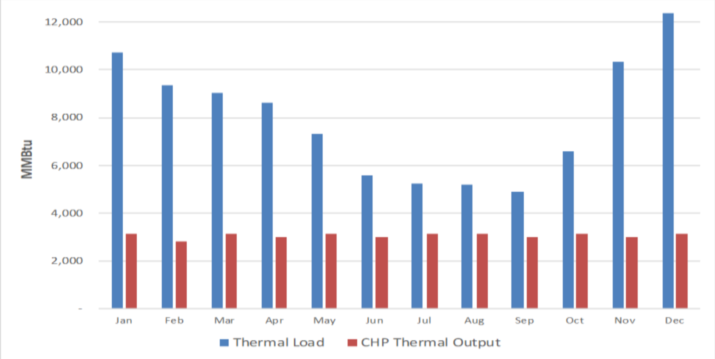
Natural Gas: 40,000 MMBtu

ADG: 156,000 MMBtu

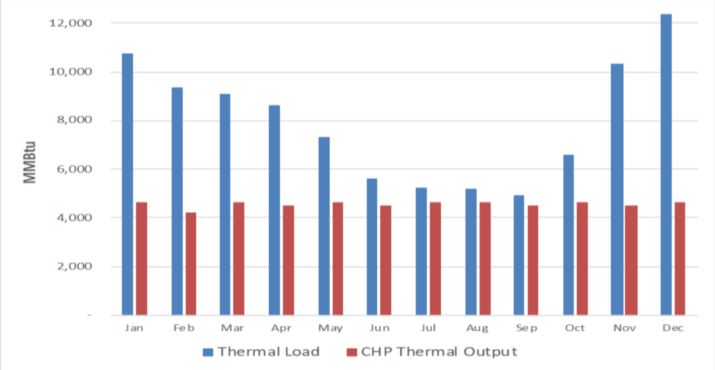
80,000 MMBtu used

76,000 MMBtu flared





Option 1: All ADG at the site is consumed either by the CHP system or boilers (1.2 MW CHP)



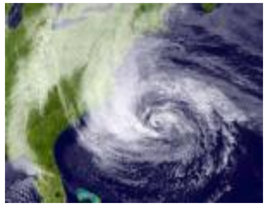
Option 2: System based on the minimum addressable thermal (1.7 MW CHP)

What Are the Benefits of CHP?

- CHP is **more efficient** than separate generation of electricity and heating/cooling
- Higher efficiency translates to **lower operating costs** (but requires capital investment)
- Higher efficiency **reduces emissions** of pollutants
- CHP can also provide **energy reliability particularly important at WWTPs**
- On-site electric generation can **reduce grid congestion** and avoid distribution costs.

Resiliency

- Behind the meter CHP reduces electric demand of WWTP's
- When installed with black start and island mode capabilities CHP can provide uninterrupted power in the event of grid outages, allowing for continued operation of critical infrastructure
- 11 billion gallons of untreated and partially treated sewage flowed into waterways due to loss of power at metropolitan NY and NJ WWTPs in the aftermath of Super Storm Sandy [1]



[1] https://www.climatecentral.org/news/11-billion-gallons-of-sewage-overflow-from-hurricane-sandy-15924

Climate Action Council's Draft Scoping Plan

W4. Water Resource Recovery Facility Conversion

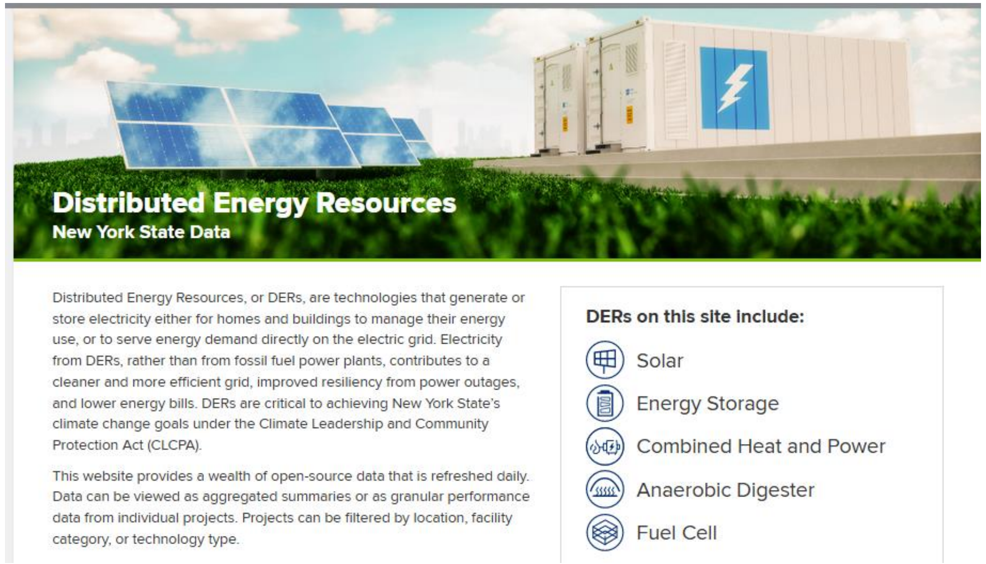
- Transforming wastewater treatment plants to emphasize the capture of beneficial products is a key component of the circular economy.
- WWTPs represent much of the capacity for organics materials management in New York, present tremendous opportunity for reducing GHG emissions.
- ***The Climate Justice Working Group (CJWG)* favors <u>on-site</u> use of biogas captured from WWTPs and that no significant new transmission infrastructure be allowed to support additional biogas.*** Source: Scoping Plan: Full Report December 2022. New York State Climate Action Council. Page 330.

*CJWG is comprised of representatives from Environmental Justice communities statewide, including three members from New York City communities, three members from rural communities, and three members from urban communities in upstate New York, as well as representatives from the State Departments of Environmental Conservation, Health, Labor, and NYSERDA.

NYSERDA Funded CHP at WWTPs

- Over 10 projects at 7 different facilities with installed capacity of 4.8 MW
- **Consumed 2,141 MMcf biogas to produce 100 GWH**
- Predominantly RICE prime mover providing base load generation, exporting to grid, with HW heat recovery for digester heating and space heating.

- Baseline WWTP Emissions (grid electricity and natural gas combustion, CHP FCEtherm 40%, Boiler Eff. 80%) = 641,803 tons CO_2e
- Emissions from NYSERDA WWTP CHP systems = 378,386 tons CO_2e
- CHP Portfolio delivered 263,416 tons CO_2e savings over system life to date.
  - 20,263tons CO_2e / yr
  - 4,221.4 tons CO_2e / yr / MW

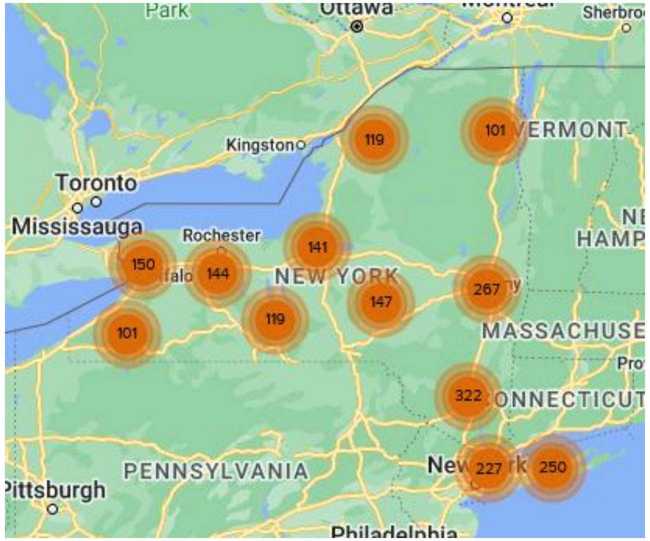


Source: https://der.nyserda.ny.gov/map/

NY CHP Potential - WWTP

- Of the 600+ WWTP in NY, 136 utilize anaerobic digestion and produce biogas / methane.
- These WWTPs with anaerobic digestion produce 24,782 MCF of biogas daily.
- Currently over 60 MW of CHP at WWTP's around NYS.
  - Technologies include reciprocating engines, turbines, fuel cells as well as direct drive blowers and pumps with heat recovery
  - Sizes range from 200 kW to 16 MW

- Nine (9) large WWTPs (> 5 MGD) without known beneficial use of biogas, produce enough biogas to accommodate an additional 9 MW
  - Potential emissions reductions of 218,106 tons CO2e / year



data.ny.gov/Energy-Environment/Wastewater-Treatment-Plants-Map/86wk-kekc

Project Snapshot:
CHP at Wastewater Treatment Plants

Oneida County Sewer District Water Pollution Control Plant
Utica, NY

Application/Industry: Wastewater Treatment Plant
Capacity: 600 kW (additional 400 kW in progress)
Prime Mover: Microturbine
Fuel Type: Biogas
Thermal Use: Process and building heat
Installation Year: 2019

Highlights:
- Additional 400 kW of capacity received 75% funding from NY Environmental Facilities Corporation (EFC) Green Infrastructure Grant.
- Installation of the anaerobic digester replaced existing sludge incinerators that operated on fuel oil, resulting in significant operating cost and emissions (CO_2, SO_2, Mercury) reductions.
- Facility accepts source separated organic (SSO) waste from Oneida-Herkimer County Recycling center, diverting waste from landfill and increasing biogas production.

Project Snapshot:
CHP at Wastewater Treatment Plants

North River Wastewater Treatment Plant

Harlem, NY

Application/Industry: Wastewater Treatment Plant
Capacity: 12 MW
Prime Mover: Reciprocating Engine
Fuel Type: Biogas & Natural Gas
Thermal Use: Process and building heat
Installation Year: 2022

Highlights:

- The facility is replacing ten (10) existing fuel oil engines with five (5) dual fuel (biogas and natural gas) reciprocating engines.
- This project is anticipated to reduce annual GHG emissions by nearly 50% (approximately 26,000 MT CO_2 / yr).
- Facility is also performing an LED lighting upgrade anticipated to deliver emissions reductions of 1,000 MT CO_2 / yr.

https://www1.nyc.gov/html/dep/html/press_releases/18-112pr.shtml#.Y-qYsa3MJhE

Project Snapshot:
CHP at Wastewater Treatment Plants

Rockland County Wastewater Treatment Plant

Orangeburg, NY

Application/Industry: Wastewater Treatment Plant

Capacity: 633 MW

Prime Mover: Reciprocating Engine

Fuel Type: Biogas

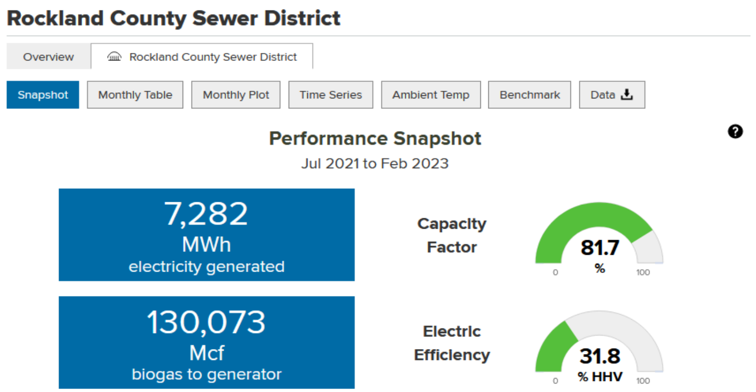
Thermal Use: Process and building heat

Installation Year: 2021

Highlights:

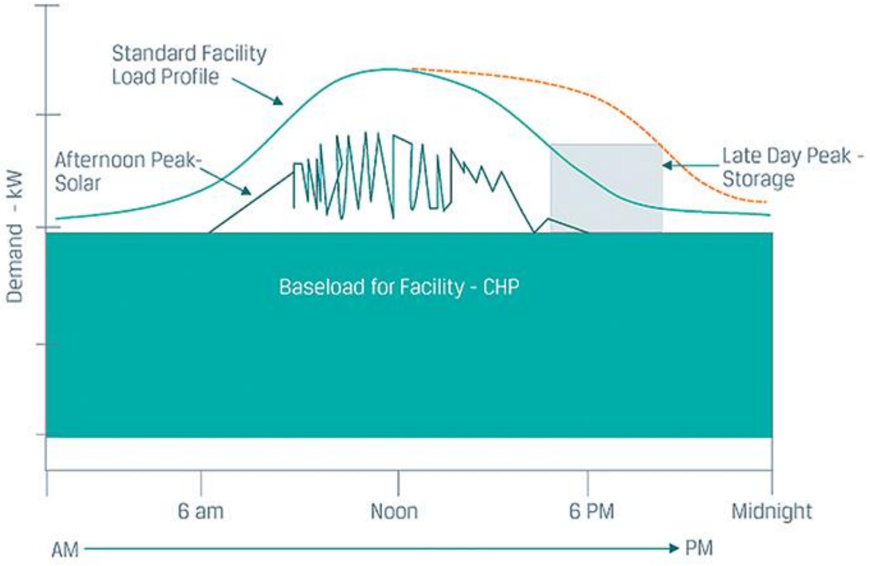
- CHP system installed in order to make use of excess biogas that historically was flared.
- Project includes gas treatment system in order to extend engine life. System removes moisture, particulates, hydrogen sulfide (H_2S), and siloxane.
- Before CHP the facility flared nearly 60% of the biogas produced. CHP operation is anticipated to reduce flared biogas to < 8%.

https://der.nyserda.ny.gov/reports/view/performance/?project=2380



Growth of Hybrid DER Systems

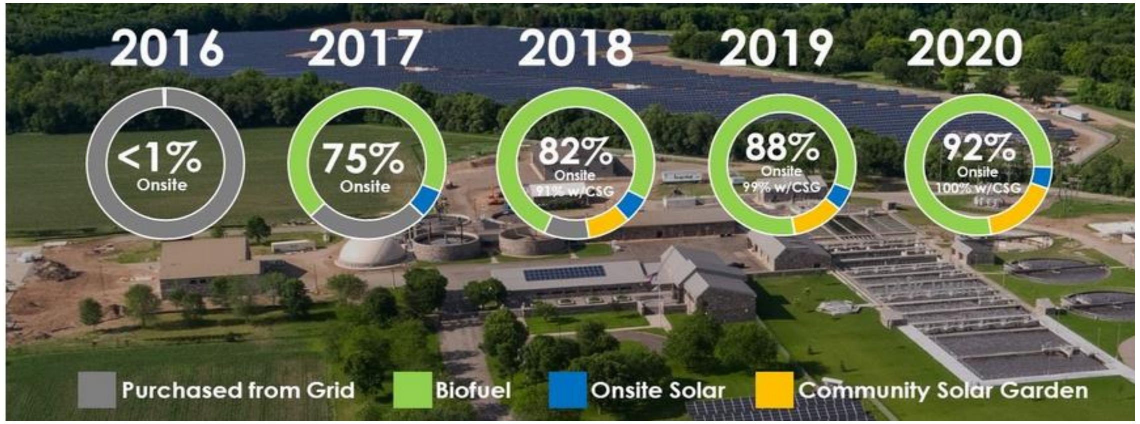
- Hybrid DER approaches offer the opportunity for technologies to complement one another
- Hybrid systems combine characteristics of individual technologies
  - CHP – provides baseload energy
  - Solar – variable renewable generation can now be "firmed"
  - Storage – adding flexibility
- Allows CHP to be a key part of the move toward a distributed/renewable grid



Project Snapshot:
CHP at Wastewater Treatment Plants

St. Cloud Nutrient, Energy, and Water Recovery Facility
St. Cloud, MN

Application/Industry: Wastewater Treatment Plant
Capacity: 633 MW
Prime Mover: Reciprocating Engine
Fuel Type: Biogas & Natural Gas
Thermal Use: Process and building heat
Installation Year: 2021



Highlights:

- CHP system installed to make use of biogas produced from treatment process.
- Facility has operated many days at Net Zero, where all energy needed is produced on-site and from community solar. The biogas fueled CHP system is responsible for > 75% of onsite power generation.
- Facility utilizes Lystek process to produce Class A Biosolids that is bagged and sold for use as fertilizer.

https://www.ci.stcloud.mn.us/1512/Energy-Efficiency-Biofuel-E2B-Recovery-P

https://www.clarke-energy.com/2017/st-cloud-duel-fuel-engine/

Food Waste Diversion

- NYS Food Donation and Food Scraps Recycling Law went into effect January 1, 2022[1]
- Requires large generators of food scraps (> 2 tons / week on avg.) required to donate edible food and recycle remaining scraps if within 25 miles of organics recycler
- Co-digestion of WWTP sludge along with food waste or fats, oils, and grease (FOG) can enhance biogas production from anaerobic digestion by 50 – 185% and 100 – 410% respectively[2]
- Expanding number of AD's accepting food scraps is a win-win
  - Increased diversion of organic waste from landfills, reducing fugitive methane emissions
  - Increased biogas production and low carbon, onsite power generation and thermal resource from CHP
  - WWTP's can recoup system installation costs with tipping fees associated with accepting food scraps

[1] https://www.dec.ny.gov/docs/materials_minerals_pdf/foodscrapsleg.pdf
[2] https://www.frontiersin.org/articles/10.3389/fenvs.2017.00070/full

CHP for Grid Support

- CHP can be deployed now to make use of available resources (biogas) to reduce energy consumption.
- Significant increases in grid demand are anticipated as more vehicles and building heating systems are electrified resulting in increased cost for electricity.
- Anticipate increased need for dispatchable resource that can ramp up to meet variations in facility demand or respond to Utility, ISO, or market signals.
- CHP provides energy flexibility, isolating facilities from future increases in utility costs.

CHP TAP Role: Technical Assistance

Screening and Preliminary Analysis

Quick screening questions with spreadsheet payback calculator; Advanced technical assistance to explore equipment or operational scenarios.

Feasibility Analysis

Perform 3rd Party reviews of site feasibility assessments: Estimates on savings, installation costs, simple paybacks, equipment sizing, and type.

Investment Grade Analysis

Perform 3rd Party reviews of Engineering Analysis. Review equipment sizing and choices.

Procurement, Operations, Maintenance, Commissioning

Review specifications and bids.

DOE TAP CHP Screening Analysis

- **High level assessment to determine if site shows potential for a CHP project**
  - **Quantitative Analysis**
    - Energy Consumption & Costs
    - Estimated Energy Savings & Payback
    - CHP System Sizing
  - **Qualitative Analysis**
    - Understanding project drivers
    - Understanding site peculiarities

	Base Case	CHP Case
Annual Energy Consumption		
Purchased Electricty, kWh	88,250,160	5,534,150
Generated Electricity, kWh	0	82,716,010
On-site Thermal, MMBtu	426,000	18,872
CHP Thermal, MMBtu	0	407,128
Boiler Fuel, MMBtu	532,500	23,590
CHP Fuel, MMBtu	0	969,845
Total Fuel, MMBtu	532,500	993,435
Annual Operating Costs		
Purchased Electricity, $	$7,060,013	$1,104,460
Standby Power, $	$0	$0
On-site Thermal Fuel, $	$3,195,000	$141,539
CHP Fuel, $	$0	$5,819,071
Incremental O&M, $	$0	$744,444
Total Operating Costs, $	$10,255,013	$7,809,514
Simple Payback		
Annual Operating Savings, $		$2,445,499
Total Installed Costs, $/kW		$1,400
Total Installed Costs, $/k		$12,990,000
Simple Payback, Years		**5.3**
Operating Costs to Generate		
Fuel Costs, $/kWh		$0.070
Thermal Credit, $/kWh		($0.037)
Incremental O&M, $/kWh		$0.009
Total Operating Costs to Generate, $/kWh		**$0.042**

CHP screening analysis

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Billing days per month		31	28	31	30	31	30	31	31	30	31	30	31	365
Electricity Bill Data														
Monthly Electric Use kWh		314,896	415,658	399,882	288,952	553,359	518,596	514,023	500,416	380,979	469,093	489,757	453,181	5,298,792
Monthly Peak Demand kW		905	902	948	926	1,057	1,083	1,131	1,138	1,031	989	953	915	998
All-in Monthly Cost (Commodity plus T&D)		$33,471	$40,725	$38,031	$32,339	$43,026	$57,081	$61,210	$56,314	$55,570	$46,210	$44,281	$48,463	$556,722
Average 'all-in' $/kWh		$0.1063	$0.0980	$0.0951	$0.1119	$0.0778	$0.1101	$0.1191	$0.1125	$0.1459	$0.0985	$0.0904	$0.1069	$0.1051
Fuel Bill Data: Fuel Type	**Nat Gas**													
Monthly Fuel Use	Therm	10,648	14,274	14,846	9,390	20,020	15,395	12,257	10,224	8,337	12,464	13,716	15,134	156,705
Monthly Fuel Cost	$	$8,429	$9,863	$10,219	$4,631	$10,417	$7,532	$5,674	$5,145	$4,815	$6,738	$11,094	$11,809	$96,368
Average Cost of Fuel	$/MMBtu	$7.9163	$6.9098	$6.8833	$4.9317	$5.2036	$4.8929	$4.6293	$5.0322	$5.7759	$5.4057	$8.0885	$7.8031	$6.1496
Fuel for Addressable Thermal Load	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Addressable Thermal Load Fuel	MMBtu	1,065	1,427	1,485	939	2,002	1,539	1,226	1,022	834	1,246	1,372	1,513	15,670

Step 2 - Site Operating Schedule

Site Operating Schedule: Other

If operating schedule is "other", fill in monthly hours in Table 1 in green highlighted cells

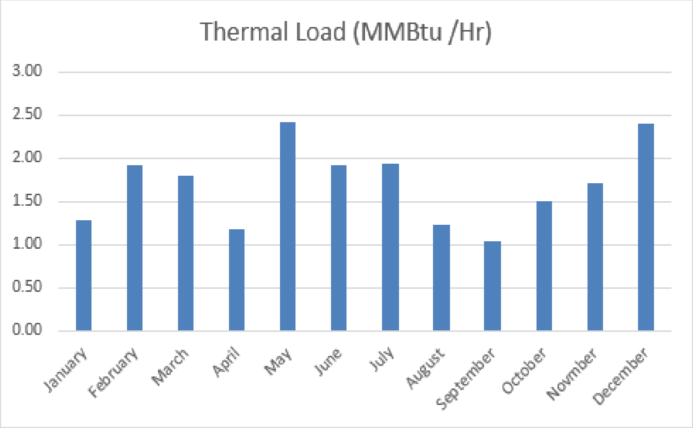
Step 3 - Displaced Thermal Equipment Efficiency

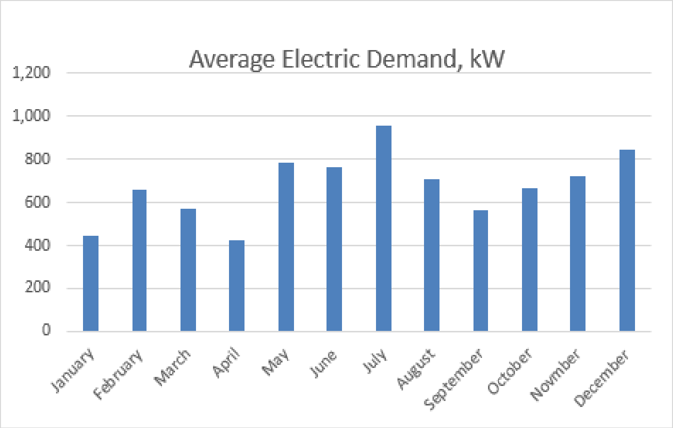
Displaced Thermal Efficiency: 85.0%

Table 1 - Addressable Thermal Load

	Monthly Hours	MMBtu Fuel	MMBtu Load	MMBtu Load/Hr	Seasonal Thermal Load	
January	**705**	1,065	905	1.28	Winter	
February	**633**	1,427	1,213	1.92	3,405	MMBtu
March	**705**	1,485	1,262	1.79	**1.8**	MMBtu/hr
April	**681**	939	798	1.17		
May	**705**	2,002	1,702	2.41	Shoulder	
June	**681**	1,539	1,309	1.92	6,696	MMBtu
July	**537**	1,226	1,042	1.94	**1.6**	MMBtu/hr
August	**705**	1,022	869	1.23		
September	**681**	834	709	1.04	Summer	
October	**705**	1,246	1,059	1.50	3,220	MMBtu
Novmber	**681**	1,372	1,166	1.71	**1.7**	MMBtu/hr
December	**537**	1,513	1,286	2.40		
Total	7956	15,670	13,320	**1.67**		
		Displaced Thermal Efficiency	85.0%			

CHP screening analysis





CHP Operating Schedule based on Thermal Loads	**Winter/Shoulder**			**12 months**		
Average Addressable Thermal Load (MMBtu/hr) / Thermal Load Factor (%)	1.61	MMBtu/hr*	89.8%	1.67	MMBtu/hr**	88.9%
Minimum Addressable Thermal Load (MMBtu/hr) / Thermal Load factor (%)	1.04	MMBtu/hr	100%	1.04	MMBtu/hr	100%

4a - Select CHP Operating Schedule: 12 Months

4b - Select Addressable Thermal Load: 1.04 MMBtu/hr

Thermal Load Factor: 100.0%

*Average Addressable Load based on Shoulder Months;

Minimum Addressable Load based on Winter/Shoulder Months

**Average and Minimum Addressable Load based on 12 Months

Prime Mover Driven CHP Performance Assumptions

Table 1. Comparison of CHP Characteristics for Typical Systems [1, 2]

Characteristic	Technology				
	Reciprocating Engine	Gas Turbine	Microturbine	Fuel Cell	Steam Turbine
Size Range	10 kW–10 MW	1 MW–300 MW	30 kW–330 kW (larger modular units available)	5 kW–2.8 MW (larger modular units available)	100 kW–250 MW
Electric Efficiency (HHV)	30–42%	24–36%	25–29%	38–42%	5–7%
Overall CHP Efficiency (HHV)	77–83%	65–71%	64–72%	62–75%	80%
Total Installed Cost ($/kW) [3]	$1,400–$2,900	$1,300–$3,300	$2,500–$3,200	$4,600–$10,000	$670–$1,100 [4]
O&M Cost (¢/kWh)	0.9–2.4	0.9–1.3	0.8–1.6	3.6–4.5	0.6–1.0
Power to Heat Ratio	0.6–1.2	0.6–1.0	0.5–0.8	1.3–1.6	0.07–0.10
Thermal Output (Btu/kWh)	2,900–6,100	3,400–6,000	4,400–6,400	2,200–2,600	30,000–50,000
Fuel Pressure (psig) [5]	1–75	100–500 (may require fuel compressor)	50–140 (may require fuel compressor)	0.5–45	n/a
Part Load Efficiency	Good at both part-load and full-load	Better at full-load	Better at full-load	Better at full-load	Good at both part-load and full-load
Type of Thermal Output	LP steam, hot water, space heating, chilled water	LP-HP steam, hot water, process heating, chilled water	LP steam, hot water, chilled water	LP steam, hot water, chilled water	LP-HP steam, hot water, chilled water
Fuel	Can be operated with a wide range of gas and liquid fuels. For CHP, the most common fuel is natural gas.			Hydrogen, natural gas, propane, methanol	Steam turbines for CHP are used primarily where a solid fuel (e.g., coal or biomass) is used in a boiler.

https://betterbuildingssolutioncenter.energy.gov/chp/resources-publications

CHP e-Catalog

PERFORMANCE DATA

Performance data presented below is based on capacity that is available at the respective prime mover load conditions. Fuel data is in Higher Heating Value (HHV). Note that when multiple thermal capacities are presented e.g. hot water, steam, chilled water and/or ORC kW, these capacities are based on using all the thermal heat available from the prime mover and should be viewed as independent and not concurrent with other thermal capacities. Exception, for reciprocating engines steam production is generally using only exhaust heat so that hot water or chilled water capacity is concurrent with the steam capacity. All performance ratings are at sea level and adjustments should be made for operation at altitude, particularly for microturbines and combustion turbines. In all cases, contact th Packager or Solution Provider for site specific details.

		100% GROSS POWER			75% GROSS POWER			50% GROSS POWER		
	Ambient Temperature	95°F	59°F	0°F	95°F	59°F	0°F	95°F	59°F	0°F
	CHP Fuel Input (MMBtu per hour HHV)	79.0	89.0	102.3	64.7	72.6	92.6	52.2	58.0	65.5
POWER	Gross Electricity Output (kW)	6,710	7,968	9,332	5,033	5,976	6,999	3,355	3,984	4,666
POWER	Net Electricity Output (kW)	6,660	7,918	9,282	4,983	5,926	6,949	3,305	3,934	4,616
POWER	Net Electric Efficiency % (HHV)	28.8	30.4	31.0	26.3	27.9	25.6	21.6	23.2	24.1

Note for Gas Turbines: Direct drying/heating must have 4" of inlet and outlet losses incorporated in the ratings

DIRECT PROCESS HEAT	Exhaust temperature (after heat recovery) Type Selection	Standard Drying (200°F)								
DIRECT PROCESS HEAT	Oxygen Content in Exhaust Gas in percent by volume (%)	14	14	13	14	14	13	14	14	13
DIRECT PROCESS HEAT	Direct Process Heat Capacity (MMBtu/hr)	41.40	44.00	47.40	35.30	37.50	39.90	30.40	32.10	34.00

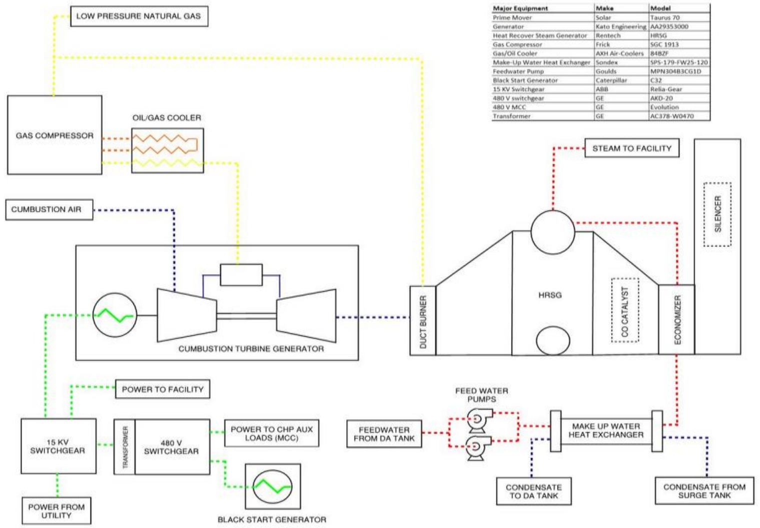
Fuel Gas Pressure to Packaged CHP System (psig)	1	25	50	100	300
Fuel Gas Booster Compressor Power Required (kW)	416	258	189	131	11

EMISSIONS	Emissions Aftertreatment	Combustion turbine with no aftertreatment
EMISSIONS	NOx Emissions (lb/MWhe)	0.64
EMISSIONS	CO Emissions (lb/MWhe)	0.66

FOOTPRINT

	WIDTH IN FEET	LENGTH IN FEET	HEIGHT IN FEET	WEIGHT IN POUNDS
Prime Mover/Generator system (Includes maintenance clearances)	20	47	17	123,000
Heat Recovery subsystem if separate (Includes maintenance clearances)	20	65	20	380,000
Chiller if separate (Includes maintenance clearances)	0	0	0	0
Total System Layout (Includes maintenance clearances)	40	112	20	503,000
Largest part for delivery	9	37	12	116,557
Heaviest part for delivery	9	37	12	116,557

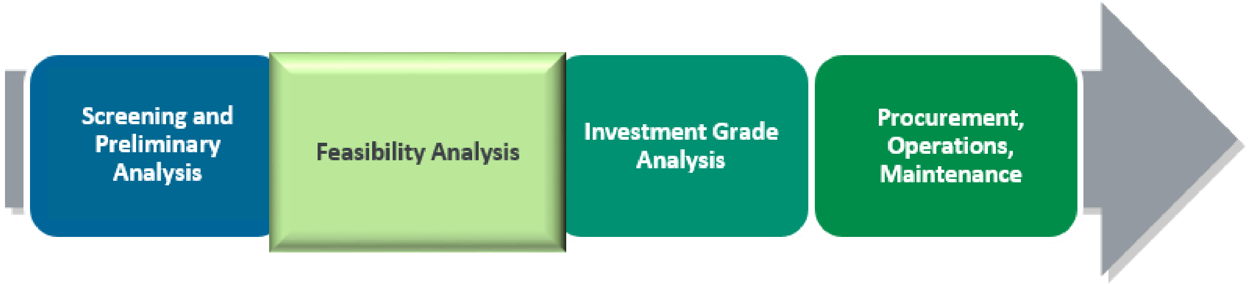
PACKAGED CHP SYSTEM SIMPLIFIED SCHEMATIC



https://chp.ecatalog.ornl.gov

U.S. Department of Energy
CHP Technical Assistance Partnerships

A Feasibility Analysis Typically Involves:



- Electrical load profiling
- Thermal load profiling
- Unit sizing
- Thermal use determination (what to do with the heat)
- Installation cost estimations
- Financial calculations (simple payback, ROI, etc.)
- Cost/savings information compared to what your facility would pay if the CHP system were not installed

Biogas Use Options – CHP vs. Boilers

NYC DEP - Port Richmond

60 MGD Design, 28 MGD Average (2015)
84,000 MMBtu per year Biogas Production[1]

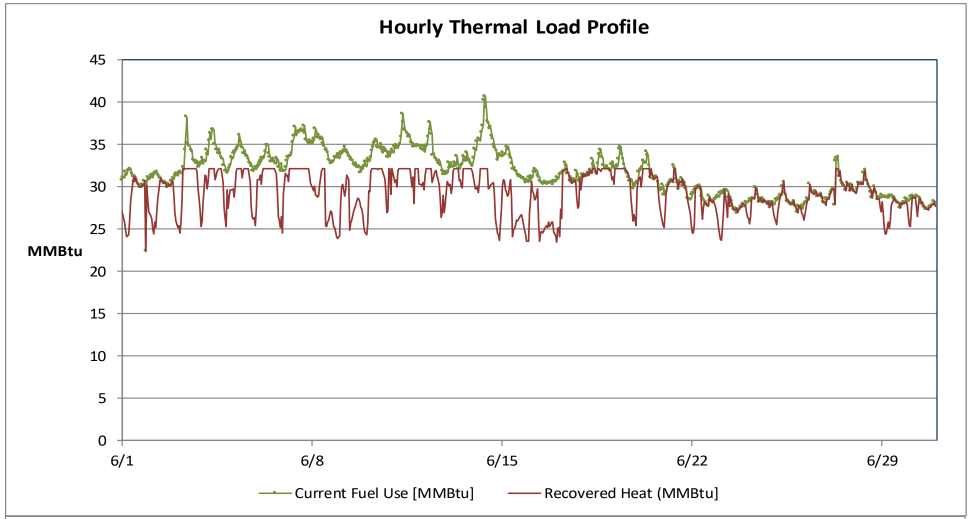
Scenario 1
PV Solar[2] = 1,600,000 kWh/yr (10% of electric load)
Biogas Boilers[3] = 58,000 MMBtu (47% of heat load only)

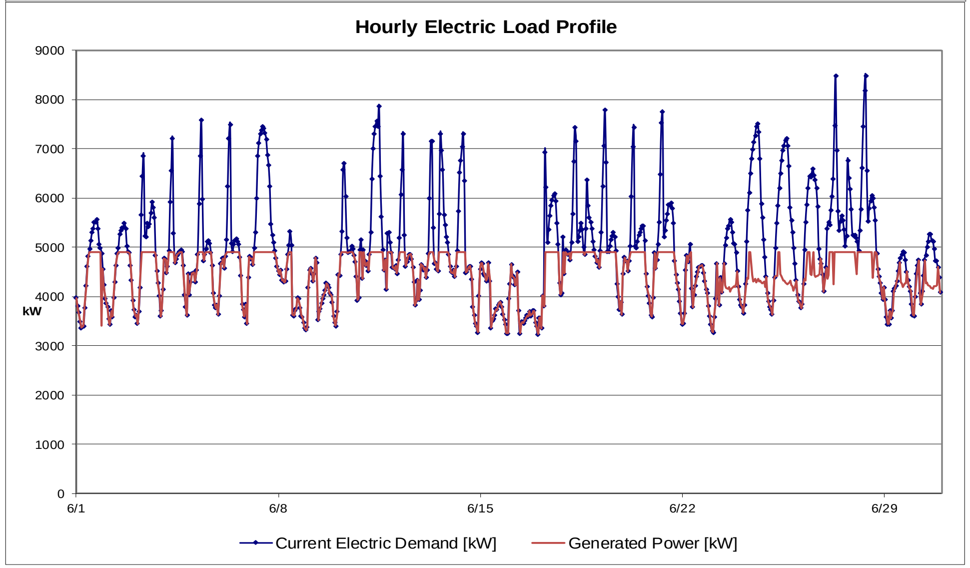
Scenario 2
Biogas CHP = 7,385,697 kWh/yr (46% of electric load)
+ 33,600 MMBtu (27.2% of heat load)

26,000 MMBtu flared annually under Scenario 1

[1] NYC DEP – 2018
[2] https://www1.nyc.gov/html/dep/html/press_releases/15-085pr.shtml#.Y9gsc63MJhF
[3] 385000CF x 365 Days x 600 Btu x 80% boiler x 75% LF. Est Biogas = 70% of total load. Facility boilers are dual fuel (Biogas & NG).

Example Hourly Analysis





Averge load	4,897	kW
Maximum load	8,485	kW
Minimum load:	3,227	kW
Total Electricity Usage	3,526,104	kWh
Actual Electricity Generated	3,192,811	kWh
Actual Electricity Generated	90.5%	
System Efficiency	77%	
CHP Operating Hours	720	hr
Operating hours %	100%	
CHP system size	4,897	kW
Heat rate:	12,793	Btu/kWh
Number of units	1	
Minimum engine load allowed:	50%	

Funding Sources

- Environmental Facilities Corporation - Green Innovation Grant Program – Energy Efficiency[1]
  - Round 12 of funding closed July 29, 2022. Applicants must complete a Consolidated Funding Application (CFA)
    - DEC has indicated there are significant funds available, stay tuned for new round of funding
  - Qualifying projects must provide power to a Publicly Owned Treatment Works (POTW) and may include wind, solar, micro-hydroelectric, and biogas CHP
  - Projects may receive up to 50% of total eligible costs, or 75% if in environmental justice area.

1 - https://efc.ny.gov/gigp

IRA Tax Credits

- Inflation Reduction Act
  - Base & Bonus Rates
    - The base rate for the ITC is 6%.
    - The bonus rate for the ITC is 5 times the base rate (30%)
    - Taxpayers receive the bonus rate for meeting the prevailing wage and apprentice requirements. Projects under 1 MW are exempted
  - Applicability to ‘Non-Profit’ Municipal WWTPs
    - Organizations exempt from tax under subtitle A of the Internal Revenue Code are “applicable entities” for direct payments. If the facility is exempt, they would be eligible for a direct production payment. The Treasury Department will have to create some regulations and procedures allowing taxpayers to make direct pay claims.

https://chpalliance.org/wp-content/uploads/2019/08/CHPA-IRA-FAQ-Final-Factsheet.pdf

IRA Tax Credits

- Plus 10% Points: Domestic Content Bonus
  - To meet the domestic content requirement the facility must use 100% domestic iron and steel and a specified percentage of domestic manufactured products, which changes by year: 2023: 40%, 2024: 40%, 2025: 45%, 2026: 50%, 2027 and later: 55%
- Deadline for the sec. 48 ITC to January 1, 2025.
- Tech Neutral Credits (sec. 45Y, 48E)
  - Only zero-emissions facilities placed in service after December 31, 2024, are eligible for the technology-neutral PTC or ITC
  - The technology-neutral credits phase out as greenhouse gas emission reduction targets in the electric sector are reached.
  - The applicable year means the later of the calendar year in which electric sector greenhouse gas emissions are equal to or less than 25% of 2022 emissions or 2032.

https://chpalliance.org/wp-content/uploads/2019/08/CHPA-IRA-FAQ-Final-Factsheet.pdf

Additional Resources Addressing Tax Credits

Midwest Cogeneration Association (MCA). please visit the following MCA Webinar recording of a David Gardinar's presentation on IRA/ITC Tax Credits related to CHP https://attendee.gotowebinar.com/recording/8658387316124991833

Visit the Combined Heat and Power Alliance (CHP Alliance) website for information on tax credits.

- https://chpalliance.org/frequently-asked-questions-chp-and-whp-in-the-inflation-reduction-act/

  https://chpalliance.org/combined-heat-and-power-inflation-reduction-act/

Summary

- CHP is a proven technology which is commercially available and has a history of deployment in tandem with other renewable technologies
- CHP is an essential component of the transition to carbon free energy systems.
  - CHP gets the most out of a renewable fuel source
  - High overall utilization efficiencies
  - Integration with and support of renewables and storage
- WWTPs are an ideal site for these technologies
  - Base load application with both electric and thermal needs
  - Critical infrastructure in need of resiliency which CHP provides
  - Incorporation of food scraps diverts waste from landfills, satisfying NY Food Scraps Law, and enabling increased biogas (power and heat) production

Next Steps

Contact CHP TAP for assistance if:

- You are interested in having a "no-cost" Qualification Screening performed to determine if there is an opportunity for CHP on-site.
- If you have an existing CHP plant and are interested in expanding the plant.
- If you need an unbiased 3rd Party Review of a CHP proposal.

Thank You

Questions?

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http://www.energy.pace.edu/

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