NYC Environmental Protection

Bill de Blasio, Mayor
Vincent Sapienza, P.E., Commissioner

WEEKLY PIPELINE ENERGY

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Commissioner's Corner: Energy Edition

***Pam Elardo**, DEP's Deputy Commissioner for the Bureau of Wastewater Treatment, is a guest commentator this week.*

This week's **Energy Edition** of Weekly Pipeline describes some of our ongoing and future projects and successes in energy and sustainability. We face many challenges—like simultaneously meeting the ambitious OneNYC energy reduction goals and new energy-intensive water/wastewater quality regulatory mandates, while integrating and not sacrificing state-of-good-repair needs. With the right people and the ability to put creative solutions to work, we can get there.

In the Bureau of Wastewater Treatment, our core mission to protect public health and the environment defines us, and provides the basis for enhancing sustainability for our utility. We are advancing from being handlers of wastewater for the purpose of meeting permit conditions to being progressive leaders in sustainable operations and resource recovery, seeking the best investments for environmental and social solutions. In fact, wastewater treatment plants are now widely recognized as Wastewater Resource Recovery Facilities (WWRFs) producing valuable products for local, regional, national, and international sustainability.

This makes DEP and BWT essential leaders to meet the City's ambitious energy and sustainability goals we have before us.

In September 2017, **Mayor Bill de Blasio** released the 1.5°C: Aligning New York City with the Paris Climate Agreement plan, which committed New York City to its first-ever energy reduction goal of 20% by 2025 for City-owned buildings and to a goal of citywide carbon neutrality by 2050. These new targets joined the existing OneNYC goals, including an 80% reduction in greenhouse gas emissions by 2050, energy-neutral wastewater treatment plants by 2050, zero waste to landfills by 2030, 100 megawatts of solar on City-owned properties by 2025, 100 MWh of energy storage by 2020, 50 MW enrolled in Demand Response by 2017, and many more.

DEP's in-city wastewater treatment plants (WWTP) present a unique and significant opportunity to make major strides toward accomplishing each of these goals. We are already taking advantage of many opportunities, and with the right investments we can make these goals a reality. Consider some examples:

Digester gas is worth its weight in gold, and investing in digestion and solids processing at all our facilities creates multiple benefits:

- Our digesters create biogenic gas for direct beneficial use and can divert food waste away from taking valuable landfill space and creating landfill methane
- Biogas beneficially used on-site reduces DEP's greenhouse gas (GHG) emissions and utility energy needs and costs
- Biogas can also be used off-site to supplement the utility natural gas system daily or when needed, like during the coldest winter days
- Our infrastructure can be dispatched during Demand Response events to assist our regional energy supply and serve to prevent blackouts in the city
- WWRFs produce biosolids that are an incredibly valuable resource with multiple benefits, providing carbon sequestration among them

In addition to biogas and biosolid opportunities:

- Our treatment plant campuses have fairly large and unobstructed footprints, a rarity in NYC, which means we have great potential for solar photovoltaic power
- WWRF processes sustainability-enhancing products, like phosphorous and bioplastics, thereby avoiding GHG emissions from otherwise intensive manufacturing processes
- Our massive sewers collection and conveyance systems contain water that remains at a fairly constant temperature annually, which can be made available for district heating and cooling throughout the city
- Best yet, with our fourteen WWRFs distributed across this great city, we are poised to provide local solutions in each borough
- And the list goes on…

I would like to thank all DEP employees and partners for your diligence and enthusiasm in supporting these initiatives together as we strive to mitigate the worst effects of climate change and move the wastewater treatment industry toward our destiny, leading the charge for resource recovery and global sustainability. The time is now.

Spotlight on Safety

Enhancing Manhole Safety

Did you know that manhole fires are often caused by damaged electrical wires that run underneath the street? This is even more common in the winter months when melted snow and road salt run into the sewers and can cause arcing or sparking cables. As the insulation on the cable burns, it emits combustible gases that can cause fires.

In an effort to prevent manhole fires and other incidents, Con Edison has begun installing sensors in manholes to help detect these gases before a fire can occur. Con Edison crews have installed 1,000 of the sensors and plan to install another 1,000 by the end of 2017. The company chooses the manholes where it will install sensors based on analysis of its underground electrical delivery equipment. When a sensor signals a buildup of gas or heat, Con Edison engineers evaluate and determine whether to send personnel to the site. It is estimated that the sensors could help reduce manhole fire events by 10 percent this winter. Other measures Con Edison has taken to reduce incidents include vented manhole and service box covers, and infrared cameras to detect underground "hot spots."

Con Edison supplies energy to 2.5 million customers. For more information on the company's efforts to enhance manhole safety, visit Con Edison's website.

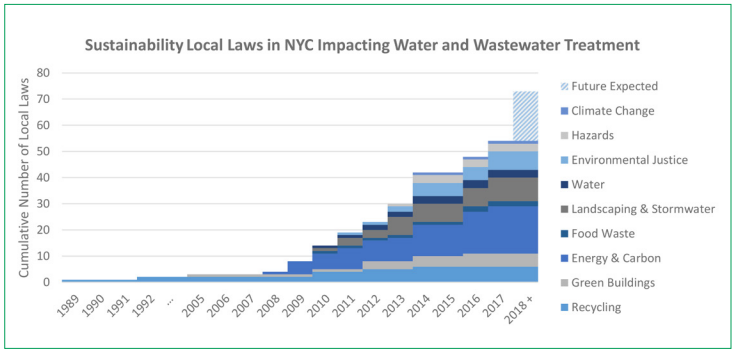
At DEP, everyone is responsible for safety. If you or anyone on your team is concerned about your working conditions, it's okay to ask your supervisor or your bureau's EHS liaison how they can help. If you've still got questions, you can call the EHS Employee Concerns Hotline. It's DEP's responsibility to acknowledge and fix unsafe situations, procedures, and practices. With your help, we'll not only get the job done, we'll make it safer for ourselves, our coworkers, our families, and our city. CALL (800) 897-9677 OR SEND A MESSAGE THROUGH PIPELINE. HELP IS ON THE WAY.

Kudos Corner

Samy Phlamon, Deputy Plant Chief at Hunts Point WWTP, was recognized by the Department of Citywide Administrative Services last month with a 2017 Energy Champion Award at the annual Citywide Energy Recognition Ceremony. Among Samy's outstanding accomplishments is his initiation of Hunts Point's power demand management protocols that helped to reduce peak electric demand by 18% since 2013, and resulted in energy bill savings of about $500,000 over the same period.

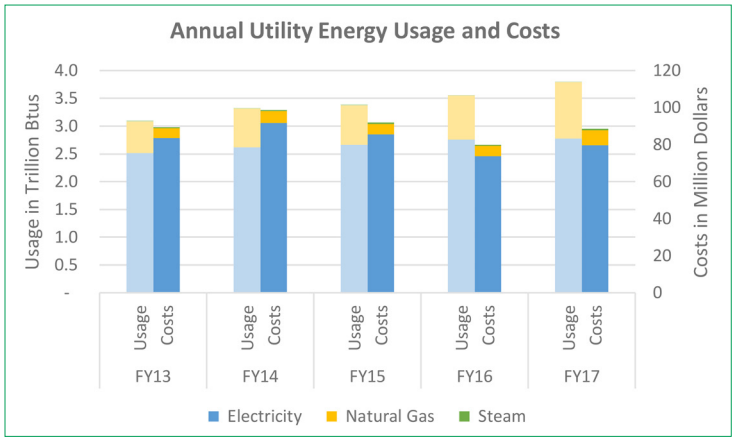
DEP's Bureau of Water Supply (BWS) was also recognized for their Energy Smart Competition, which concluded earlier this year. The winning facilities of the Competition were Grahamsville, Pine Hill, and Tannersville WWTPs; Downsville Office/Shop; Kensico Manor Annex; and Sutton Park Office. Accepting recognition on behalf of BWS were Acting Director of Energy **Mikael Amar** and Deputy Commissioner of Wastewater Treatment **Pam Elardo**. Congratulations to all!

Energy-Saving Goals and Strategies



The BEDC Sustainability Section seeks to proactively implement energy-saving and greenhouse gas reduction strategies into DEP's Capital Program through progressive design, standard operating procedures, guidance documents, and in-person workshops. These strategies align DEP with citywide goals outlined in OneNYC and various Local Laws, as well as an internal agency commitment to provide the best investment for NYC ratepayers. Sustainability-related regulations are consistently growing, with a particular focus on energy and carbon, and these vigorous regulations serve to drive DEP's capital program and push our designers to innovative solutions. BEDC Sustainability will continue to support DEP as a leader across City agencies for energy conservation. Improvements, suggestions, ideas, and questions can be directed to **Erika Jozwiak** at EJozwiak@dep.nyc.gov.

Utility Energy Use and Costs



For Fiscal Year 2017, DEP spent $88.5 million on 3.8 trillion British Thermal Units of utility electricity, natural gas, and steam, a 7% increase in usage and 11% increase in cost this year versus last year. Adjusted for a mild winter in 2016, DEP's energy usage increased by only 5%, attributable in part to preparations being made for an upcoming cogeneration system at North River WWTP. As part of the 1.5°C: Aligning New York City with the Paris Climate Agreement plan, DEP is committing to reduce its overall energy consumption wherever feasible using smarter operations, integration of energy-conservation-measures into state-of-good-repair work, and water demand management.

Why Energy Matters to…

***Ariane C. Brotto**, Ph.D., Energy Project Manager*

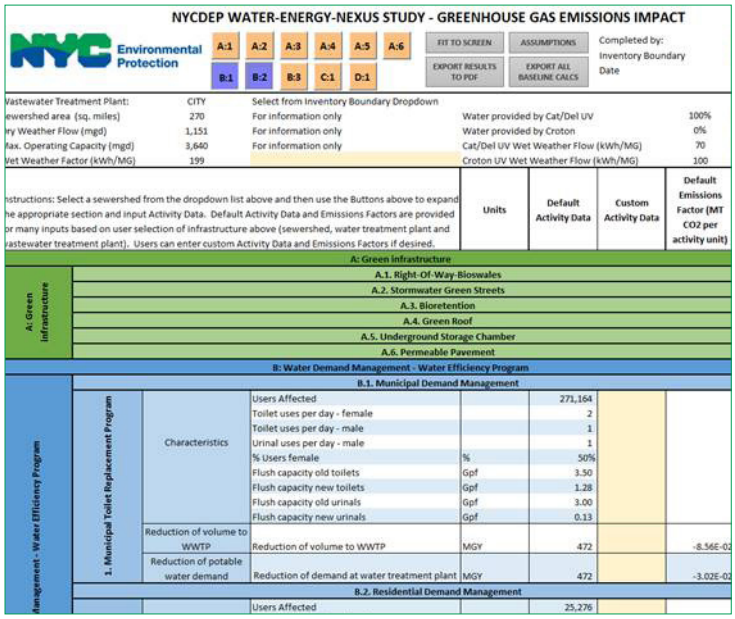
Energy is intrinsic to every living and non-living thing. It's always existing and continuously transforming. Over the years, we have found ways to utilize this energy in our favor by replicating naturally-occurring systems into more timely and efficient processes, spurring some of the greatest breakthroughs in science and human history. Among those, water management and sanitation have transformed the way we perceive public health and human rights. However, the reliance on energy-intensive processes for safe drinking water supply and wastewater treatment conflicts with current sustainable development and climate change mitigation goals. On one hand, increasing regulatory demand to achieve greater removal of pollutants significantly affects energy requirements—while on the other, we aim to meet ambitious energy and greenhouse gas (GHG) emissions reduction goals.

Motivated by this paradox, I embarked on a pioneering mission to develop the first bottom-up protocol for the measurement of direct GHG emissions from activated sludge processes in Rio de Janeiro, Brazil, and consequently produced the first dataset of GHG emissions from the wastewater sector in the country. Currently, as the Energy Project Manager with the DEP Office of Energy, I have the privilege to work in collaboration with our Bureaus to develop a wide range of research and opportunities for renewable energy, lower carbon footprint, and energy-efficient water supply and wastewater treatment operations, while also contributing to DEP's energy and GHG data management and reporting efforts. As we engage in the OneNYC goals, comply with Local Law energy and water benchmarking, and strive for net-zero energy, I look forward to leading with a holistic and sustainable approach to energy, sanitation, and water quality, and to setting an example for generations to come.

Exploring Solar PV and Energy Storage

Last month, DEP visited a 1.8-megawatt solar PV system, the Camden Solar Center, at Camden County Municipal Utilities Authority in New Jersey to learn about their innovative application of solar power installed over wastewater treatment process tanks. In partnership with DCAS, DEP is conducting a solar PV and energy storage feasibility study for Wards Island WWTP—a project that would be the first of its kind in the City. Additionally, DEP Fleet will be placing portable solar carport electric vehicle charging stations at three DEP facilities, and DEP Water Supply is studying the feasibility of energy storage and rooftop, vacant land, and parking lot solar PV solutions at five upstate locations. These projects, and multiple other opportunities to expand renewable energy technologies throughout DEP's portfolio of facilities, support the City's energy and carbon neutrality goals to help mitigate the worst effects of climate change.

Saving Water at WWTPs



NYCDEP WATER-ENERGY-NEXUS STUDY - GREENHOUSE GAS EMISSIONS IMPACT

Environmental Protection

A:1 A:2 A:3 A:4 A:5 A:6 B:1 B:2 B:3 C:1 D:1

FIT TO SCREEN | ASSUMPTIONS | EXPORT RESULTS TO PDF | EXPORT ALL BASELINE CALCS

Completed by: Inventory Boundary Date

Wastewater Treatment Plant:	CITY	Select from Inventory Boundary Dropdown		
Sewershed area (sq. miles)	270	For information only	Water provided by Cat/Del UV	100%
Dry Weather Flow (mgd)	1,151	For information only	Water provided by Croton	0%
Max. Operating Capacity (mgd)	3,640	For information only	Cat/Del UV Wet Weather Flow (kWh/MG)	70
Wet Weather Factor (kWh/MG)	199		Croton UV Wet Weather Flow (kWh/MG)	100

Instructions: Select a sewershed from the dropdown list above and then use the Buttons above to expand the appropriate section and input Activity Data. Default Activity Data and Emissions Factors are provided for many inputs based on user selection of infrastructure above (sewershed, water treatment plant and wastewater treatment plant). Users can enter custom Activity Data and Emissions Factors if desired.	Units	Default Activity Data	Custom Activity Data	Default Emissions Factor (MT CO2 per activity unit)
A: Green Infrastructure				
A: Green Infrastructure — A.1. Right-Of-Way-Bioswales				
A.2. Stormwater Green Streets				
A.3. Bioretention				
A.4. Green Roof				
A.5. Underground Storage Chamber				
A.6. Permeable Pavement				
B: Water Demand Management - Water Efficiency Program				
B.1. Municipal Demand Management				
1. Municipal Toilet Replacement Program — Users Affected		271,164		
Characteristics — Toilet uses per day - female		2		
Toilet uses per day - male		1		
Urinal uses per day - male		1		
% Users female	%	50%		
Flush capacity old toilets	Gpf	3.50		
Flush capacity new toilets	Gpf	1.28		
Flush capacity old urinals	Gpf	3.00		
Flush capacity new urinals	Gpf	0.13		
Reduction of volume to WWTP — Reduction of volume to WWTP	MGY	472		-8.56E-02
Reduction of potable water demand — Reduction of demand at water treatment plant	MGY	472		-3.02E-02
B.2. Residential Demand Management				
Users Affected		25,276		

The Wastewater Treatment Plant Water-Energy Nexus (WWTP-WEN) Study is an extension of work recently performed by BEPA to develop an Excel-based tool to better understand the carbon footprint benefits of DEP's sustainability programs, including water demand management and green infrastructure. The WWTP-WEN study will identify water conservation opportunities—such as utilizing plant effluent instead of city water, retrofitting mechanical seals, or replacing float valves—at three WWTPs and will quantify the potential embedded energy and carbon impacts. More information on DEP's WEN tool can be found at nyc.gov/dep/climatechange.

We welcome your feedback! To submit an announcement or suggestion, please email us at: newsletter@dep.nyc.gov.