Many of New York State’s water resource recovery facilities (aka, wastewater treatment plants) are moving in the direction of becoming Utilities of the Future (UoF). This conference will highlight some of these facilities; individual projects and technologies that can be components of UoFs; as well as mechanisms for funding such projects.

Utilities of the Future go far beyond traditional public health and environmental objectives by:
• Generating renewable energy using open space and other horizontal assets;
• Capturing waste heat and latent energy from biosolids and liquid streams;
• Reclaiming and finding commercial uses for nutrients and other constituents;
• Using green infrastructure to manage stormwater and protect urban waterways; and
• Reclaiming and reusing water.

Program and Schedule

7:45 am–8:15 am Registration

8:15 am–8:30 am Welcome, Steven Fangmann, NYWEA President

8:30 am–9:00 am WERF Barriers to Energy Efficiency Project: Current Energy Position of New York Wastewater Treatment Facilities*+
Nancy Andrews, Colin O’Brien, Brown and Caldwell; Lauren Fillmore, Water Environment Research Foundation (WERF)
Using a comparison of data sets from 2003 and 2013, WERF/NYSERDA research documents the current energy position of the publicly owned New York water resource recovery facilities (WRRFs) and quantifies the magnitude of recent energy performance shifts based on the net effect of efficiency gains, increased electrical production, and increased process equipment loads. Importantly, the research also incorporates electronic survey data to identify the underlying organizational factors that correlate to improvements in energy performance.

9:00 am–9:30 am Case Study: Ithaca Area WWTF Path to Sustainable Energy Production and Reduction*
Dan Ramer, Ithaca Wastewater Treatment Facility
Over several years the Ithaca Area WWTF has prioritized projects and equipment based on reducing energy utilization and enhancing energy production. This presentation will show how these projects were funded and how they focused on taking advantage of local waste streams to increase energy production. A second objective is to help project planners think about the process to create a path for energy projects based on local conditions.

Jason Turgeon, USEPA, Region II

10:00 am–10:15 am Break
SESSION I  Anaerobic Digestion, Resource Recovery, Net Neutrality
(Location: 2, 4 King Street)

Moderators
Ely Greenberg, ERG Process Energy; Will Stradling, Siewert

10:15 am–10:45 am  Wastewater Energy Recovery: From Net Zero to Power Exporter
Tyler Masick, Gloversville-Johnstown WWTP; George Bevington, Gerhardt, LLC; Jesse Semanchik, Barton & Loguidice Consulting Engineers
The Gloversville-Johnstown Joint Wastewater Treatment Facility (GJJWTF) has been co-digesting high strength wastewater for years to produce biogas utilized for on-site power generation. A 2009 project resulted in a near “net zero” facility that routinely generates 95% to 100% of the required electrical energy to operate the entire plant. This presentation will outline a 2014 project that is underway that will result in the facility exporting power 24/7 by improving biogas generation and adding an additional electrical generator.

10:45 am–11:15 am  Reducing Mixing Energy in Anaerobic Digesters – New Technologies Enhancing Biosolids Handling
Luigi Tiberi, Ovivo Water
Mixing has always been a key element of Anaerobic Digestion. Energy savings can be achieved using a linear motion mixing technology. Creating a liquid core induces pulsing waves that propagate throughout the mixing zone, significantly reducing energy requirements for mixing. High-strength wastes can now be blended into primary digesters allowing for increase in biogas production. Three case studies show how this proven technology provides the same mixing intensity and efficiency at a fraction of the cost.

11:15 am–11:30 am  Break

11:30 am–12:00 pm  Quasar Energy Group’s Anaerobic Digestion System Integrated with Wastewater Treatment Plants in a Public/Private Partnership to Facilitate (Nutrient) Resource Recovery
Nate Carr, Clemens Halene, Quasar Energy Group
This presentation will examine the Wooster Renewable Energy (WRE) project, including its performance statistics, in which anaerobic digestion technology was incorporated at the City of Wooster, OH, Waste Pollution Control Plant. Anaerobic digestion technology deployed in collaboration with municipalities by third-party providers is a paradigm shift that facilitates system upgrades without straining utility budgets, relieves regulatory pressures, results in net energy production, promotes regional economic development and recycles nutrients while contributing to watershed conservation.

MORNING SESSION II  Innovative Low-Energy Treatment/Resource Recovery Technologies/Strategies (Location: Town Hall)

Moderators
Karl Scheible, Hydroqual; Silvia Marpicati, ARCADIS

10:15 am–10:45 am  Using Algae to Clean Wastewater and Create a Biofuel in New York City
Laura Bendernagel, Hazen & Sawyer; Peter May, Biohabitats
An Algal Turf Scrubber system was piloted at the New York City Rockaway Wastewater Treatment Plant as a method for removing nutrient pollution from secondary wastewater effluent. The pilot showed that algal growth could be achieved at a low cost, with demonstrable removal rates of 2.13kg/m² of nitrogen, 0.32 kg/m² of phosphorus, and 13.65 kg/m² of carbon over the course of 2012. Scale-up of the pilot and production of butanol (biofuel) from the algae was also explored.
**10:45 am–11:15 am**  
**Clean Energy from Wastes Using Sustainable Harvesting and AdaPtive Energy Reduction System**  
Omowunmi Sadik, Kun Arthur Xiang, Robert Congdon and Yu Chen, SUNY Binghamton  
With increasing energy costs and an emphasis on sustainability, the objective of this work is to develop clean energy harvesting from wastewater treatment plants (WWTPs). This presentation will discuss the Sustainable Harvesting and AdaPtive Energy Reduction (SHAPER) project, which combines novel MFC designs, new electrode materials, wireless sensor networks as well as smart, energy-efficient strategies to monitor real-time status of the entire WWTP.

**11:15 am–11:30 am**  
**Break**

**11:30 am–12:00 pm**  
**Towards Net-Zero Energy in Wastewater Treatment: Demonstration of ClearCove Enhanced Primary Treatment Technology**  
Alex Wright, ClearCove; Mark Greene, O’Brien & Gere  
ClearCove Systems and O’Brien & Gere will present the findings from their NYSERDA PON 2722 “Towards Net Zero Energy in Wastewater” demonstration project, as well as the potential for the wastewater industry that is enabled by the significant increase in energy savings and energy production.

**12:00 pm–12:30 pm**  
**Resource Savings through Sidestream Centrate Treatment**  
Daniel Dair, Andrea Nifong, World Water Works  
Anaerobically digested sludge dewater liquors (e.g., centrate) can represent 15%–25% of the TKN load on a typical municipal WWTP. Sidestream nitrogen removal has been demonstrated to be an effective tool for improving nitrogen removal performance and reliability with a savings in aeration energy, chemicals (alkalinity and supplemental carbon), and sludge production.

**12:30 pm–1:45 pm**  
**Keynote Luncheon Speaker – Ed McCormick, WEF President**  
Directions to the Utility of the Future  
*(Location: 6, 8 King Street)*

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**AFTERNOON SESSION III Energy Efficiency (Location: 2, 4 King Street)**

**Contact Hours:**  
2.5 PDH  
2.5 Wastewater  
1.5 Water

**Moderators**  
Joe Brilling, Washington County; Robin Yasinsac-Gillespie, NYSDEC

**1:45 pm–2:15 pm**  
**A Case Study of the Ogdensburg, NY, WWTP Energy Optimization with High-speed Turbo Blowers, Fine Bubble Aeration and Digester Gas Conditioning with Storage**  
Mark Koester, Koester Associates, Inc.  
The City of Ogdensburg received a grant allowing them to update existing 50-Hp centrifugal blowers with high-speed turbo blowers. This, combined with replacing their medium efficient coarse bubble aeration system to a new high efficiency fine bubble aeration, will provide them with 50 percent power savings with the aeration process. In addition, they are installing a digester gas conditioning system to fully utilize their membrane gas holder for storage and optimization of the digester gas for fueling their boiler.

**2:15 pm–2:45 pm**  
**Blower Optimization Is Only One Step to Energy Efficiency**  
Silvia Marpicati, ARCADIS  
To evaluate aeration system efficiency, it is important to consider that blowers are one of the three main components of the aeration system. To fully optimize an aeration system, all three components must be considered: 1) Control strategy; 2) Oxygen transfer; and 3) Air production. This presentation will discuss the key considerations for truly optimizing an aeration system. A case study of the Town of Greenwich, CT, Grass Island WWTP will be presented.

**2:45 pm–3:00 pm**  
**Break**
3:00 pm–3:30 pm  
A Holistic Approach to Plant Control Provides Both Process Improvement and Energy Savings
Tito Stahl, Steven Kestel, BioChem Technology, Inc.

Holistic (adj.): Relating to or concerned with complete systems rather than with individual parts
Holistic control concepts for complex systems can outperform unit process controls by optimizing each unit process for the final outcome. The presentation describes an IFAS plant in the Chesapeake Bay watershed containing anoxic swing zones, a combination of coarse and fine bubble diffusers, mixed liquor recycle and an upstream trickling filter. The process controller integrates multiple control loops to improve total nitrogen removal and reduce energy costs by over 20 percent versus conventional control methods.

3:30 pm–4:00 pm  
Performance Contracting: An Integral Solution for Achieving Sustained Operational and Energy Efficiency
Zia Qureshi, Jeff Miller, Andrew Apgar, Schneider Electric

This presentation will discuss how performance contracting was a benefit to achieving a utility’s needed improvements and allowed long-term sustained operational and energy efficiency. Specific challenges related to a project in Florida will be discussed. While today’s cities and counties face numerous challenges, few operations face tougher requirements or more demanding circumstances than water and wastewater utilities. Budget shortfalls, shrinking revenues and staff reductions make it nearly impossible to address aging and inefficient infrastructure and escalating regulatory demands. Well-maintained water and wastewater infrastructure is critical to a utility’s ability to properly and efficiently operate water use, water quality and water resources. The active maintenance of infrastructure requires significant capital investment, and Florida faces a sizable structural deficit where capital needs outpace available funding. Without action, declining infrastructure will impact the state’s water and wastewater systems that serve 19.3 million people. However, utilities do have options, and a performance contracting program that is integrated into a comprehensive strategy may very well be the answer for which they are looking.

4:00 pm–4:15 pm  
Break

4:15 pm–5:15 pm  
Go to Town Hall Session for Ending Plenary Session and conference wrap up

AFTERNOON  
SESSION IV  Innovative On-site Power Generation Technologies and Financing Mechanisms (Location: Town Hall)

Contact Hours: 2.5 PDH  2.5 Wastewater  0.5 Water+

Moderators
Kathleen O’Connor, New York State Energy Research and Development Authority (NYSERDA);
Tucker Cox, CDM Smith

1:45 pm–2:15 pm  
The State of Solar Energy in New York State+
Ian Diamon, Solar City

This presentation is intended to educate decision makers about solar energy in the state of New York, and how water and wastewater facilities can benefit. Discussion will include recent developments in New York for solar power, including the New York Solar Smart program, new NYSERDA incentives for commercial solar, the financial benefits of solar, and how water and wastewater entities can implement solar without capital requirements.

2:15 pm–2:45 pm  
Funding and Design Process for Microturbine ADG-to-Electricity Systems
Lauren Ray, GEM Energy

The use and design of microturbine power generation technology for wastewater anaerobic digester gas (ADG) to electricity system has become more prevalent in the last decade. A step-by-step microturbine system design process that includes applying for NYSERDA ADG-to-Electricity (PON 2828) incentive funding is discussed in this presentation. Topics will include digester gas production and composition testing, impact of additional feedstocks such as dairy whey, system sizing, gas conditioning requirements, utility interconnection process, waste heat utilization and control and monitoring systems.

2:45 pm–3:00 pm  
Break
3:00 pm–3:30 pm  **Effects of Energy Efficiency, Anaerobic Digestion, High Strength Waste and CHP on Wastewater Rate Structures**  
George Bevington, Gerhardt, LLC; Dennis Clough, Energy Systems Group  
The economic advantages of utilizing energy efficiency and power generation at wastewater treatment plants will be discussed along with impacts these systems have of wastewater rates.

3:30 pm–4:00 pm  **Biogas Utilization: Raising the Bar via Resource Recovery**  
Edward Weinberg, ESSRE Consulting; Robert Mroz, HYTEK-Bio  
Novel approaches provide an economic jolt to anaerobic digester facilities via focus on wastewater resource recovery approaches that 1) produce more biogas using unique co-digestion of food-related wastes, 2) mitigate GHG emissions of CO₂, NOₓ from biogas engines for profit via carbon capture and recovery (CCR) technology that involves the growth and harvesting of microalgae in specialized photobioreactors, and 3) provide enhanced nutrient reduction and recovery to support microalgal growth or as fertilizer offsite.

4:00 pm–4:15 pm  **Break**

4:15 pm–5:15 pm  **Ending Plenary Session and conference wrap up**

4:15 pm–4:45 pm  **Private Financing and Design of Biogas Projects**  
Carter Strickland, Andy Shea, Karl Schieble, Kristen Munoz, HDR, Inc.

**** Contact Hours: 0.5 PDH (if previous session is attended)****

Anaerobic digesters represent a significant opportunity to reduce costs and diversify income. Owners and operators of WWTPs with underutilized digester capacity or those facing digest replacements should attend this presentation to learn about the options. HDR experts will present the economics, technical issues and lessons learned from two projects the company has developed for diverse clients who used private financing strategies. In Ridgewood, New Jersey, HDR designed a privately-financed combined heat and power facility at a municipal treatment plant that fully uses an existing digester system through a liquid waste receiving, holding and feeding system that delivers additional feedstock to the digesters and will therefore increase biogas production. The project also included systems to store and treat biogas and a generator system that will provide power for use within the plant. In Denver, Colorado, HDR has designed and is currently constructing a privately-financed, greenfield stand-alone anaerobic digestion facility that will use feedstocks that include cow manure, restaurant grease trap waste, spoiled products from retail grocers and food processing residuals and other organic wastes from the metropolitan area to produce beneficiated biogas for the interstate natural gas system.

4:45 pm–5:15 pm  **Closing Remarks, Call to Action and Wrap Up of the Day**  
Ed McCormick, WEF President

### Available at the Conference


**WEF’s President, Ed McCormick will have signed books available at the Registration Desk.**

This publication, a must-read for utility leaders everywhere, takes the wealth of information that is available from a wide variety of sources, consolidates the thinking of dozens of leading water and energy professionals working in this arena, and boils it all down to a succinct, easy-to-read, and visual energy leadership guide full of good, practical ideas on becoming more energy efficient and sustainable – with a financial benefit to our ratepayers.

Ed McCormick is the editor of this publication.
ClearCove Systems is built around a solution that separates organics from wastewater, the company’s focus is to effect positive change by introducing dramatic energy reduction in treatment processes and by enabling treatment plants to become self-sustaining through renewable-energy production. 125 Tech Park Dr., Rochester, NY 14623, (585) 267-5004, www.clearcovesystems.com

Demand Response Partners, headquartered in Buffalo, is a Demand Response service provider in the NYISO grid operator control area and a pioneer in Automatic Demand Response. 360 Delaware Ave., Suite 406, Buffalo, NY 14202, (716) 842-1600, www.demandresponsepartners.com


GEM Energy provides comprehensive energy services and technologies including integration of power generation, advanced heating and cooling systems, supply-side procurement and management, demand-side load reduction and building control systems, for commercial, industrial, institutional and mission critical facilities. 6842 Commodore Dr., Walbridge, Ohio 43465, (518) 490-6446, www.gemenergy.com

Koester Associates, Inc. provides consistent, high-quality solutions to the water and wastewater industry. Representing industry-leading manufacturers, Koester covers all of New York State, including Long Island, New Jersey and Canada for sales, application, implementation and servicing. 3101 Seneca Turnpike, Canastota, NY 13032, (315) 697-3800, www.koesterassociates.com

MICROrganic Technologies is developing and deploying a technology that eliminates the energy associated with aeration. The company uses electrogenic microorganisms that can perform aerobic metabolism in an anaerobic environment. Seeking demonstration and strategic partners. 1477 South Schodack Rd., Castleton, NY 12033, (518) 732-7505, http://microrganictech.com


Natural Systems Utilities (NSU) proudly features our Community CoDigestion service offering. We provide innovative public private partnerships where we can secure feedstocks and energy offtakers, provide needed project financing for unique anaerobic digestion projects at municipal WWTP settings. 2 Clerico Ln., Hillsborough, NJ 08844, (908) 431-7017, www.naturalsystemsutilities.com

Unison Solutions is the leader in biogas to energy systems. With over 200 projects sold, we help communities and businesses put their biogas to work by producing electricity, heat and vehicle fuel. 5451 Chavenelle Rd., Dubuque, IA 52002, (563) 585-0967, www.unisonsolutions.com
## Upcoming Meetings and Training

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<td>December 11, 2014</td>
<td>Environmental Finance Center, Syracuse, NY</td>
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<td><strong>Basic Operations Course, Monroe County</strong></td>
<td>January 7–April 1, 2015</td>
<td>Training Center, Rochester, NY</td>
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<td><strong>Blower Technologies, Selection and Energy Evaluation</strong></td>
<td>January 15, 2015</td>
<td>Williamsville, NY</td>
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<td><strong>87th Annual Meeting &amp; Exhibition</strong></td>
<td>February 2–4, 2015</td>
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<td><strong>Anaerobic Digestion</strong></td>
<td>February 27, 2015</td>
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<td><strong>Class A &amp; B Biosolids Drying Technologies</strong></td>
<td>March 11, 2015</td>
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<td><strong>Blower Technologies, Selection and Energy Evaluation</strong></td>
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<td><strong>Workplace Hazards &amp; Compliance, Biohazards and Personal Protective Equipment</strong></td>
<td>April 2, 2015</td>
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<td><strong>Fundamentals of Low Pressure Sewers to Address Wet Weather</strong></td>
<td>April 8, 2015</td>
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<td><strong>Anaerobic Digestion</strong></td>
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<td><strong>Legislative &amp; Regulatory Dialogue</strong></td>
<td>May 5, 2015</td>
<td>Legislative Office Building, Albany, NY</td>
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<td><strong>Class A &amp; B Biosolids Drying Technologies</strong></td>
<td>May 21, 2015</td>
<td>Troy, NY</td>
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<td><strong>Spring Technical Conference &amp; Exhibition</strong></td>
<td>June 1–3, 2015</td>
<td>The Sagamore Hotel, Bolton Landing, Lake George, NY</td>
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<td><strong>Blower Technologies, Selection and Energy Evaluation</strong></td>
<td>June 17, 2015</td>
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<td><strong>Fundamentals of Wastewater Asset Management</strong></td>
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<td><strong>Green Infrastructure Maintenance Training Program</strong></td>
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<td><strong>Fundamentals of Wastewater Asset Management</strong></td>
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