



GREEN  
RESERVE

The American Recovery and Reinvestment Act (ARRA), Green Project Reserve of 2009, through the Clean Water State Revolving Fund, provided funding for a wide variety of qualifying projects in the categories of: *green infrastructure, energy efficiency, water efficiency, and other innovative projects*. For more information on projects that have been funded by the Green Project Reserve and for additional details, visit [www.epa.gov/ow/eparecovery](http://www.epa.gov/ow/eparecovery).

# Increasing Energy Efficiency through ARRA Funding: New York State Wastewater Initiatives



Known as the Green Project Reserve (GPR), at least 20% of each State's total ARRA capitalization grant was required to fund a wide variety of qualifying projects in the categories of green infrastructure, energy efficiency, water efficiency, and other innovative projects.

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Since the enactment of the American Recovery and Reinvestment Act (ARRA) in 2009, New York State (New York) has had great success in funding innovative, energy-efficient projects as part of the ARRA Green Project Reserve due to two major factors:

- An existing collaboration with the New York State Energy Research and Development Authority (NYSERDA) to achieve greater energy savings in the wastewater sector; and

- The creation of the Green Innovation Grant Program.

This case study highlights New York's many energy-efficient, ARRA-funded activities and achievements at wastewater facilities throughout the state.



New York State  
Environmental Facilities Corporation

## CWSRF FUNDING OF ENERGY EFFICIENCY & INNOVATION

Through the Clean Water State Revolving Fund (CWSRF), New York financed critical upgrades to wastewater and stormwater infrastructure with the goal of protecting and enhancing water quality across the state. The energy conservation measures financed will improve operations at wastewater treatment systems and other facilities, while achieving other benefits, including:

- Maximizing energy use through conservation and efficiency;
- Using or producing renewable energy;
- Mitigating greenhouse gas impacts; and
- In many cases, saving on energy costs.

Energy-saving measures used in many ARRA-financed projects include:

- Improved aeration processes
- Solar power generation
- Reed bed sludge treatment
- Gravity belt sludge thickeners
- Premium efficiency motors and variable frequency drives
- Low pressure/high output lamp technology for ultraviolet disinfection
- Efficient insulation and lighting that exceeds building codes
- Combined heat and power, including alternative fuel use and anaerobic digestion

## NEW YORK'S ENERGY-EFFICIENT WASTEWATER PROJECTS

New York's ARRA allotment for the CWSRF was \$432 million—\$86.4 million of which was reserved to meet its 20% federal goal for GPR. Instead, over \$157 million, or 36%, of New York's ARRA funds qualified as GPR, with \$108 million related to energy efficiency projects.

several environmentally innovative projects which included energy-related components. These projects will save or generate over 30.2 million kilowatt hours per year (kWh/yr) when compared to baseline practices.

New York funded 80 wastewater projects under ARRA—46 of which were principally energy efficiency projects. In addition, there were

## ENERGY EFFICIENCY MEASURES & SAVINGS FOR SELECTED PROJECTS

Subprogram	Applicant	Energy Efficiency Measures	Annual kWh Avoided, Saved, or Generated Per Year*	Green Power Generated
Water Energy Partnership (WEP)	Westchester County for Mamaroneck WWTP	Dissolved oxygen controls, variable-speed drive pumps (VFDs), and improved activated sludge process	3,993,173 kWh	n/a
	Village of Greenport	Innovative, energy-efficient technology to address nitrogen limit and high efficiency UV disinfection technology to address chlorine limits	1,467,963 kWh	n/a
	Hudson	Energy-efficient upgrades to premium pumps and VFDs, aeration, sludge processing, and building lighting	636,557 kWh	n/a
Green Innovation Grant Program	Cayuga County Soil and Water Conservation District	Anaerobic digester will process local manure and agricultural and food waste, biogas/methane generation, and a combined heat and power (CHP) plant	5,475,000 kWh	Biogas/ CHP
	Johnstown–Gloversville Joint Wastewater Treatment District	CHP project treating sewage sludge and high-strength industrial food processing wastewater in an anaerobic digester to generate biogas/ methane, and utilize waste heat	3,400,000 kWh	Biogas/ CHP
	Albany County Sewer District	CHP system to capture flue gas waste heat and produce electricity from the existing sludge incinerator	3,300,000 kWh	CHP
	Medina	Biogas powered CHP, effluent powered heat pumps, solar units, and energy-efficient lighting	350,000 kWh	Solar Power**

\* Solar and CHP enhancements contributed to power generation

\*\* 20% of electrical needs



## COLLABORATION WITH NYSERDA

The collaboration between NYSERDA and the New York State Environmental Facilities Corporation (EFC) enabled New York to apply \$92 million of the total \$157 million allotment toward GPR in energy-efficient projects that will result in an estimated annual energy savings of 16.1 million kWh.

EFC administers the CWSRF in conjunction with the New York State Department of Environmental Conservation (DEC). NYSERDA houses a variety of energy-related programs including the FlexTech and Smart Focus programs, which facilitate energy evaluations and improvements by qualified energy engineering firms that have experience in the wastewater sector.

Since 2007, EFC and NYSERDA have been working together to identify ways to promote energy efficiency throughout the state's wastewater infrastructure. In 2009, EFC and NYSERDA established the Wastewater Efficiency Program (WEP), which is jointly administered. This program provides dedicated funding for energy analysis and focused coordination between the agencies for wastewater treatment facilities. The agencies worked together to identify the best use of state and federal funds to efficiently achieve multiple goals.

Early in 2009, EFC reviewed projects previously listed on the annual Intended Use Plan (IUP) for "shovel-readiness" under ARRA. EFC and NYSERDA identified which projects could benefit from an energy evaluation, then

identified and contacted 25 communities to assess their desire to participate in the FlexTech Program. With \$720,000 in funds from New York's proceeds from the Regional Greenhouse Gas Initiative (RGGI), NYSERDA coordinated energy analyses that were conducted at no cost to the municipalities.

For each project, NYSERDA's FlexTech and Smart Focus contractors analyzed potential energy efficiency improvements at each facility and developed FlexTech reports and Energy Efficiency Summary Memorandums which were provided to EPA for approval as the business case for GPR eligibility. EFC administered the CWSRF ARRA funding for the projects.

As a result of this collaboration, NYSERDA established the Baseline Standard Practices, a tool for establishing greater energy efficiency at wastewater facilities. Prior to 2009, energy baselines were not available for specific treatment processes, making it difficult for communities to choose potential energy-conserving measures that would meet wastewater treatment goals. The new Baseline Standard Practices provide a comparison of technology or equipment necessary to achieve specific wastewater treatment performance criteria based upon cost.

More information on each project's Energy Efficiency Summary Memo can be found at <http://www.nysefc.org>.

<sup>1</sup> <http://www.nyserda.org/programs/flextech.asp>

<sup>2</sup> <http://www.nyserda.org/funding/1263rfp.asp>

<sup>3</sup> Typically, FlexTech works as a 50% cost-sharing program between NYSERDA and the municipality.

## GREEN INNOVATION GRANT PROGRAM

*The Green Innovation Grant Program received the EPA's 2009 PISCES Award, recognizing its commitment to innovative, sustainable water quality financing.*

In addition to serving traditional projects already on the IUP, EFC wanted to spark initiative to promote more green and innovative projects in New York. Approximately 10% of New York's CWSRF ARRA funds were set aside for a new grant program, called the Green Innovation Grant Program or GIGP. Creating this new program allowed shovel-ready, green, CWSRF and GPR eligible projects that were not initially listed on the IUP to access ARRA funds.

Creation of the GIGP provided an unprecedented opportunity to assist projects to simultaneously protect water quality, conserve energy resources, and reduce greenhouse gas impact. The program was developed and implemented within the ARRA time frames. NYSERDA staff assisted with the review of energy-related GIGP applications. As with all GPR projects, EPA business case documentation was required, and existing engineering reports and design specifications were used as the basis for EPA approval.

The response to the GIGP solicitation was overwhelming, with 161 applications received, totaling \$282 million in requests for CWSRF/ARRA funds. Ultimately, \$38 million in grants were provided to 35 GIGP CWSRF projects with up to 90% funding. Sixteen of these were GPR energy efficiency projects and four were environmental innovation projects. Combined, these 20 projects provided an estimated 13.6 million kWh in avoided electrical use or generation.

The energy efficiency projects financed through the GIGP were components of wastewater

treatment plant upgrades. Energy savings and generation at these facilities range from 11,000 kWh/year for a solar power project, which will provide 7% of electricity on-site, to 3.3 million kWh/year for a combined heat and power project. In addition, three environmentally innovative projects used potential sources of water pollution (e.g., sewage sludge, yellow grease, and animal manure) as sources of heat and power.

One such project is an anaerobic digester to convert animal manure—which is a common non-point source of water quality impacts—and industrial food processing waste into energy. The project sponsor, Cayuga County Soil and Water Conservation District (SWCD), is not a traditional CWSRF applicant. As the SWCD does not have borrowing capacity, it could not obtain a CWSRF loan in New York. Prior to implementation of the GIGP grants, this project could not have been funded in New York. Yet this project will protect water quality by removing a non-point source of pollution while at the same time creating renewable energy and providing power to the neighboring industrial park. This innovative project is anticipated to realize the highest energy benefit of all of the NYS CWSRF projects funded by ARRA, with 5.475 million kWh generated per year.

The GIGP received the U.S. EPA's 2009 PISCES Award, which recognizes projects that exemplify the CWSRF's commitment to innovative, sustainable water quality financing for the performance and innovation.

## THE FUTURE OF GPR IN NEW YORK STATE

In concert with the EPA/DOT/HUD Sustainable Communities Partnership Pilot Program, EFC is reviewing the CWSRF program to further encourage energy efficiency in the wastewater sector as well as to meet other cross-cutting sustainability goals including smart growth, water efficiency, green infrastructure, and asset management. EFC will continue on both paths

of collaboration with NYSERDA and innovation through the GIGP.

**For additional information, contact Deidrea Miller, Assistant Director of Communications for the New York State Environmental Facilities Corporation, at (800) 882-9721.**