



# Generating Sustainability



WORKPLACE COMMUNITY ENVIRONMENT MARKETPLACE OPERATIONS

## Another Year of PROGRESS



**New York Power Authority**

Generating more than electricity



## From the Chairman and the President

We are proud to present the New York Power Authority's Sustainability Annual Report for 2011, a year that marked NYPA's 80th anniversary as New York State's leading provider of clean, reliable, low-cost electricity.

We continue to embrace the "triple-bottom-line" goals of sustainability—environmental stewardship, economic prosperity and social equity—as we consider how our actions may impact future generations. Put simply, it's our responsibility to operate and maintain our generation and transmission assets in a sustainable manner for the benefit of all New Yorkers for decades to come. We also continue to pursue projects that advance energy efficiency, renewable technologies and clean transportation.

This report specifically outlines expanding efforts to diversify our workforce, increase corporate transparency and encourage greater interaction with our customers, stakeholders and the community at large.

With this annual report, we are pleased to introduce the Power Authority's new sustainability manager. Kerry-Jane King previously led our extensive electric transportation program. She will now help advance our sustainability initiative throughout the Power Authority while communicating the importance of our efforts to the general public. Together, we expect to demonstrate how successful sustainability can be in the Empire State.



Michael J. Townsend  
*Chairman*



Gil C. Quiniones  
*President & CEO*

A handwritten signature in black ink that reads "Michael J. Townsend".

Michael J. Townsend  
*Chairman*

A handwritten signature in black ink that reads "Gil C. Quiniones".

Gil C. Quiniones  
*President & CEO*



Kerry-Jane King  
*Sustainability Manager*

It is a privilege to be part of NYPA's *Generating Sustainability* initiative. Our Sustainability Action Plan is a collaborative effort among all NYPA departments and facilities. For 2012, we have identified some new opportunities to advance the state's clean energy goals. We will continue to improve the efficiency of our operations and work with customers to implement energy efficiency and renewable energy programs. We will also invest in sustainable community projects with our neighbors and support employee efforts to promote the adoption of green practices in the workplace and at home. I look forward to working with the NYPA team to expand this important initiative.

“We expect to demonstrate how successful sustainability can be.”

**The New York Power Authority's Sustainability Action Plan**, released in 2010, is built around five key sections, which contain a total of 21 focus areas. Each focus area comes with a high-level commitment and one or more specific action items. For each year's annual report on sustainability, NYPA tracks its performance by following guidelines established by the Global Reporting Initiative (GRI). An index of GRI indicators is listed on the inside back cover of this report.

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## January – March

January marks the 50th anniversary of operations at the Niagara Power Project. NYPA earns a first place award for safe operating practices in 2010 from the American Public Power Association.

## April – June

A new partnership allows NYPA to provide power to ocean liners berthed at the Brooklyn Cruise Terminal, reducing emissions from the ships' diesel engines starting in 2013. NYPA hydropower will help create a scrap metal recycling plant while restoring a brownfield site in Niagara Falls. A national engineers group honors NYPA for efficiency work at New York City public housing.

## July – September

Economic considerations lead NYPA to cancel the Great Lakes Offshore Wind proposal; yet progress is made on a similar offshore wind farm envisioned in the Atlantic Ocean, off Long Island and New York City. Outreach meetings for the new ReCharge NY power allocation program are held statewide. NYPA responds to Tropical Storms Irene and Lee. NYPA helps New York City procure more electric vehicles.

## October – December

Recertification of NYPA's first "green" building, in White Plains, begins while its second LEED-standard facility, a new warehouse at Niagara, is completed. An overdeveloped wetland in Western New York is restored.

## KEY NYPA STAKEHOLDERS

- NYPA employees and retirees
- Labor unions
- Customers
- Local communities
- Federal and state legislators and other public officials
- Federal and state regulators
- Non-governmental organizations
- Suppliers and others that do business with NYPA
- Other New York and regional utilities
- Industry trade organizations
- New York State public at large



*This page: Native plants enhance the White Plains Office landscape.*

# A SUSTAINABLE WORKPLACE

## NYPA Employees Maintain Momentum

**The Power Authority's commitment** to create a culture of sustainability within its workplace continued to progress in 2011. Various efforts to provide NYPA employees with a safer, healthier, more diverse work environment serve the added purpose of demonstrating sustainability-in-action to customers, stakeholders and other visitors to Power Authority facilities.

Raising awareness is an ongoing process, and a number of communication vehicles are being used to educate employees and the general public about NYPA's sustainability activities.

Both the internal Powernet and the external Internet site have specific sections on the *Generating Sustainability* initiative.

### Spreading the Word

Employee "green team" volunteers are sharing ideas and experiences

via electronic communications, while a new Eco-Library is collecting books and videos on relevant topics. At NYPA's main administrative offices in White Plains, Earth Day was celebrated for an entire week in 2011, with special programs that ranged from organic gardening to electric vehicles.

In 2011, the Power Authority published its first Sustainability Annual Report, covering the 12 months of 2010. To save resources and energy, NYPA routinely posts its publications online (at [www.nypa.gov](http://www.nypa.gov)) in their entirety, so that fewer copies are actually printed. Like other state agencies and authorities, NYPA uses recycled paper for all of its printed materials.

The White Plains Office, where more than one-third of the Power Authority's 1,580 employees work, remains NYPA's shining example of sustainability with its Gold rating (existing building category) from the U.S Green Building Council (USGBC). In 2011, the process for recertification with the Council's Leadership in Energy and Environmental Design (LEED) program began, with completion expected in mid-2012.



NYPA's Workforce (as of December 31, 2010)	Number	Percent of Total
Salaried Employees	980	62%
Employees Covered by Collective Bargaining Agreements	600	38%



*This page, from left: Natural light brightens the renovated fifth floor in White Plains. Eco-friendly cleaning products help maintain the Niagara Power Project's popular visitors center.*



**CASE STUDY:  
There's Power in Diversity**

Sylvia Hamer  
Chief Diversity Officer

*A key element in NYPA's commitment to establishing a "dynamic workforce" while leveraging its purchasing power is the expansion of its diversity efforts. The intent is to reach a stage where diversity and inclusion are fully embedded in all aspects of NYPA's workplace culture and business activities. In 2011, a senior-level position of chief diversity officer was created to oversee these endeavors.*

*To reinforce NYPA's commitment to diversity, policies and procedures are being strengthened across all areas of the Power Authority. An employee diversity council has reviewed past efforts and recommended the implementation of selected best practices, approaches and strategies in the areas of: recruitment, training, retention and inclusion, targeted advertising and marketing, and corporate accountability. It is expected that improvement in these areas should have a positive impact on NYPA's 2011-2015 Strategic Plan goal of workforce renewal.*

*Outside of the workplace, NYPA has an active presence in several professional organizations, including New York State's Women in Communications and Energy (WICE), formed to promote networking and knowledge-sharing among women in energy and telecommunications jobs. In recent years, two different NYPA employees have held the WICE president's title.*

*The Power Authority also has an aggressive supplier diversity program. In support of its outreach efforts, each year the Power Authority sponsors a Purchasing Exchange for Minority- and Women-Owned Business Enterprises (MWBEs), helping vendors and suppliers connect with public agencies and private companies looking to do business with state-certified MWBEs. For its own supplier diversity efforts, NYPA has been recognized by Empire State Development for the amount of business it conducts with the MWBE community.*

The USGBC added to the site's green building status in 2011 with a separate Silver award (new construction category) for NYPA's renovation of the fifth floor, incorporating extensive use of recycled materials, more flexible workspaces and increased access to natural lighting.

Since receiving its original LEED Gold rating in 2006, the 420,000-square-foot White Plains site has added several additional green building features, including more precise monitoring of water and energy usage. Within NYPA's Information Technology data center, air flow is strategically targeted to specific areas to maximize the efficiency of the cooling system for this critical piece of infrastructure. Outside, in the parking garage, ultra-high-efficiency lighting provides illumination while nitrogen gas, which holds tire pressure better than ordinary air, is used to further improve fleet vehicle mileage. Landscaping around the building has also been modified to enhance sustainability, including increased use of native plant species that require less water.

<b>Total Recordable Incident Rate</b>	<b>1.56</b>
<b>Injuries/Non-Lost Time Rate</b>	<b>0.84</b>
<b>Lost Day Rate</b>	<b>0.71</b>
<b>Occupational Disease Rate</b>	<b>0</b>
<b>Occupational Fatalities</b>	<b>0</b>



This page, left: Utility professionals at a Women in Communications and Energy (WICE) conference; the group's president is NYPA Director of Business Integration Jill Anderson (inset).

Below: Accepting an award from Clean Air NY are NYPA staffers Susan Egginton, left, and Ida Gencarelli, right.

Opposite page: Niagara's new LEED-green warehouse.

**Growing Greener Buildings**

In Western New York, 2011 saw completion of a warehouse at the Niagara Power Project, certified to meet LEED Gold standards for new construction. Among the facility's sustainable features are more efficient insulation and indoor air quality filters, on-site storm water management and maximum utilization of daylight for 75 percent of the building's interior. In addition, the location of the warehouse was the result of a land-swap agreement between NYPA and neighboring Niagara University, and supports the university's efforts to avoid sprawl.

Feasibility studies to "green" NYPA's three visitors centers have been completed, with plans in the works to improve energy efficiency and lessen

the environmental impact of these facilities. In 2011, a demonstration wind turbine and solar photovoltaic array were installed on the grounds of the Blenheim-Gilboa Visitors Center, while planning began for a rooftop solar system at the Niagara Power Vista. Besides electricity, the two projects serve to educate the public on renewable energy technologies.

Generating clean energy is one way to help clear the air around the state. Changing commuting patterns is another. In 2011, Clean Air NY, an initiative of the state Department of Transportation, honored the Power Authority as a "Clean Air Champion" for instituting workplace policies that help improve air quality. These include flexible work schedules, preferential parking for car poolers and hybrid-electric vehicle drivers, and

announcements of Air Quality Action Day alerts that serve to raise awareness, for both employees and NYPA customers, of air pollution levels.

In keeping with Executive Order 4 (EO4), which calls for the tracking of mandatory waste reduction efforts at all state agencies and authorities, NYPA recycled 4,385 tons of waste material from all of its facilities in the 2010/2011 EO4 reporting year.

**Creating a Health and Safety Culture**

A commitment to safety is clearly spelled out in the NYPA mission statement, and 2011 saw several advances on this front. Industrial hygiene analyses have been conducted at all work sites, with particular attention to noise levels at generating facilities and indoor air quality within administrative areas. Employees are receiving information and any necessary equipment needed to provide protection from injuries and prevent illnesses.



**2011 Action Item Highlights**

<b>Green Workspace</b>	
<b>Develop green guidelines for office renovations</b>	The Niagara project's new warehouse was built and certified to meet LEED Gold standards; energy audits and other opportunities for green building improvements are being reviewed at NYPA's three visitors centers.

In March of 2011, NYPA again earned first place in the American Public Power Association’s annual Electric Utility Safety Award. It was the Power Authority’s 12th first place award since 1994. To continue this positive trend, three leading indicators have been incorporated into NYPA’s overall health and safety program. They are: *near-miss reporting and tracking* to document all near-miss events potentially impacting worker, plant or public health and safety; *tailgate talks* that are conducted each week through the closely managed and documented presentation of relevant topics to specific job classifications; and *safety walk-downs* that follow up on the findings of small-team, targeted inspections and their resulting resolution strategies, with all of this information shared with those who may be affected.

A key tenet of NYPA’s health and safety program—that “Safety is an Attitude”—is continually reinforced for the benefit of every employee and contractor. In fact, every Power Supply contractor at a NYPA facility must undergo safety orientation before starting a project.

NYPA continues to enforce and enhance its “culture of compliance” surrounding cyber security issues, a growing concern as the utility industry—and the world-at-large—become increasingly dependent on computers and electronic connections. Following a 2011 audit by the Northeast Power Coordinating Council, NYPA was recognized for having no findings or violations and several examples of excellence in its cyber security policies and procedures.

Important as computers may be, human interactions remain a critical element for every workplace activity. The Power Authority’s Human Resources Department is responsible for providing essential services and programs to attract, develop and retain a competent, motivated workforce to facilitate the achievement of NYPA’s strategic mission. It supports NYPA’s most important resource—its employees—with a variety of programs that include performance management, succession planning, mentoring, cultural diversity and, for those staff members approaching retirement age, a knowledge-capture initiative to record and share critical corporate information and expertise.



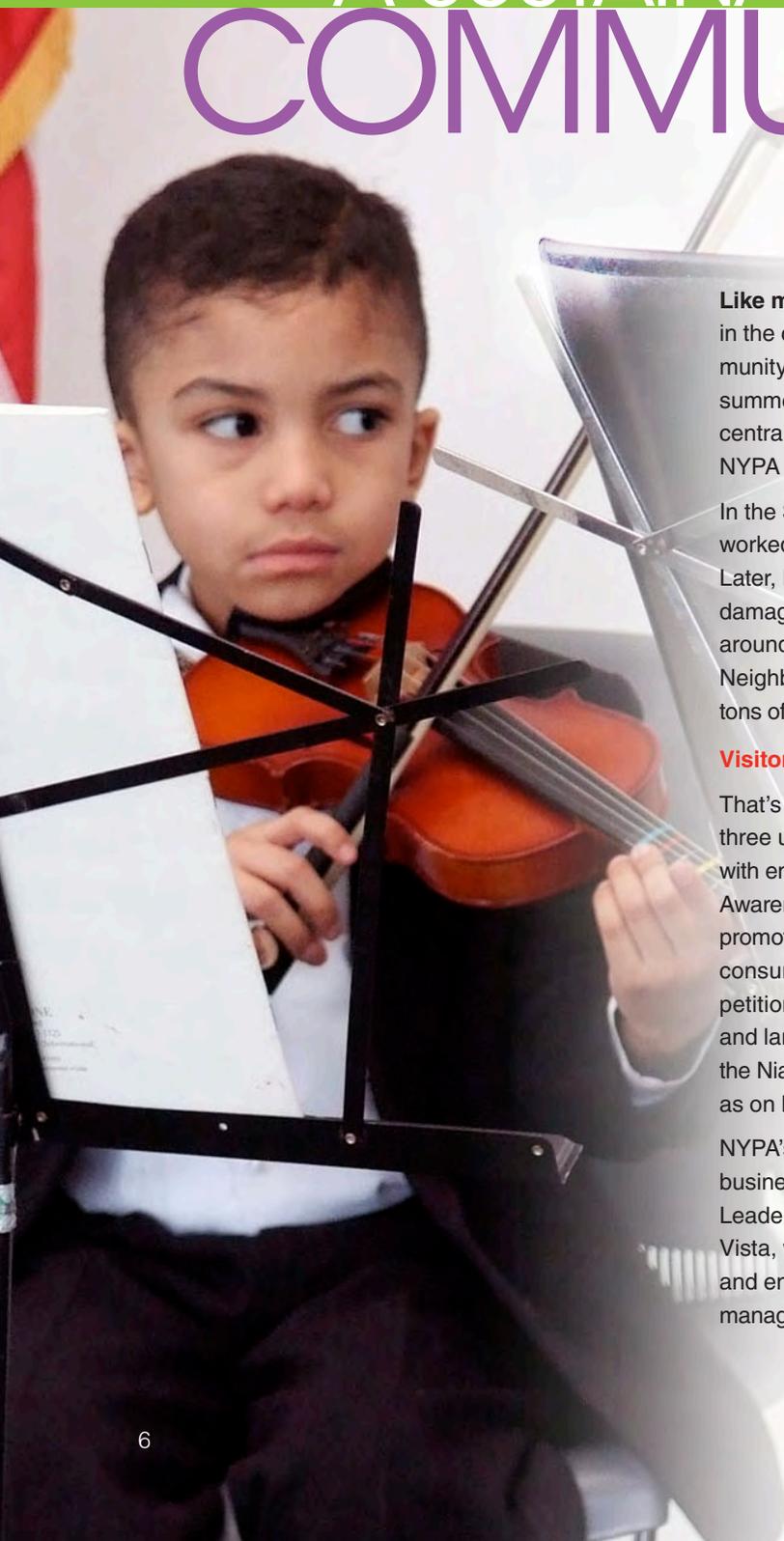
Main Training Programs	Duration Hrs	% Employees Completed
Cyber Security Awareness	0.5	98%
NYPA Code of Conduct	0.25	84%
FERC Standards of Conduct	0.5	93%
NERC Reliability Standards*	0.5	90%

\*100% of security personnel completed this program



*This page, from top: The St. Lawrence-FDR power dam can be viewed from NYPA's visitors center at nearby Hawkins Point. At the Niagara Power Vista, a young violinist prepares to perform.*

# A SUSTAINABLE COMMUNITY



**Like many New Yorkers,** Power Authority employees have a stake in the communities where they live and where they work. This community spirit was tested, and found to be strong in 2011, when a late summer storm roared up the Eastern Seaboard and ravaged parts of central and northern New York. During Tropical Storms Irene and Lee, NYPA staff members rose to the occasion.

In the Schoharie Valley and along the Mohawk River, employees worked to protect Power Authority facilities from rising floodwaters. Later, NYPA's transmission line crews provided mutual aid to storm-damaged communities while several dozen NYPA volunteers from around the state joined Gov. Andrew M. Cuomo's "Labor For Your Neighbor" campaign to help businesses and homes dig out from under tons of mud and debris.

### **Visitors Centers as Community Resources**

That's just one dimension of community support. In 2011, NYPA's three upstate visitors centers welcomed more than 120,000 guests with energy expos, wildlife festivals, films and fun. National Energy Awareness Month is now observed in October with special programs to promote public understanding of the importance of reducing energy consumption. Each spring, NYPA also hosts annual Envirothon competitions—hands-on drills testing high schoolers' awareness of soils and land use, aquatics, forestry, wildlife and other "green" issues—in the Niagara, Northern Adirondack, Oneida and Capital regions as well as on Long Island.

NYPA's visitors centers include meeting space for a host of regional business, education and social organizations. For example, in 2011, Leadership Niagara held its annual Energy Day at Niagara's Power Vista, which also welcomed groups focused on energy-efficiency and environmental studies for educators, first responder emergency management planning and law enforcement training.

In February, the St. Lawrence-FDR Power Project's Hawkins Point Visitors Center hosted the Massena Chamber of Commerce's Winter Carnival; in August anglers in the St. Lawrence County Chamber's annual carp tournament fished off the visitors center dock.

And throughout the year, the big red barn that serves as Blenheim-Gilboa's visitors center hosts various academic and community groups, including a training program for hospice caregivers. In 2011, the rustic setting received a 21st century upgrade with the installation of a 25-kilowatt (kW) solar array and a 2.4-kW wind turbine to demonstrate the effectiveness of clean energy technologies. (See Workplace section for more on NYPA's green building improvements.)

### Guidelines Govern Giving

The Power Authority provides financial support to government entities and not-for-profit organizations that demonstrate a clear link to NYPA's mission. Besides operations directly involved with energy issues, NYPA contributes to local first-responder organizations that serve and protect Power Authority facilities. The Power Authority also follows strict ethics guidelines, which in 2011 resulted in no legal actions for any anti-competitive, anti-trust or monopoly practices.

Separate funding programs are established in connection with specific licensing and construction activities in particular regions. This has been the case for the federal relicensing of

NYPA's two largest hydroelectric facilities: the St. Lawrence-FDR Power Project, in 2003, and the Niagara Power Project, in 2007. At both sites, environmental improvements and recreational enhancements are being implemented along with additional benefits for the host communities.

### Outreach Meets Special Needs

Similarly, in 2011, NYPA continued its Environmental Justice (EJ) outreach efforts in neighborhoods located near Power Authority facilities that may experience more than their fair share of economic and environmental impacts from policy decisions often made without their input. The Power Authority has joined other state agencies in supporting officially recognized EJ communities, both in urban centers and rural regions, through a policy that includes bilingual communications and other expanded opportunities to provide information and receive local input regarding any new projects or major developments occurring nearby.



# Promoting Trust & Cooperation



*This page, from left: Blenheim-Gilboa goes green with new solar and wind power systems. Top: White Plains Youth Bureau members learn about electric vehicles from NYPA Community Relations Representative Justin Connor.*

In 2011, NYPA's Environmental Justice division began a series of outreach meetings with EJ community groups in Buffalo; progress was also made in developing an implementation plan to address EJ issues.

Also in 2011, NYPA representatives worked with officials of the New York City Department of Correction to notify EJ communities prior to the announcement of a new cogeneration plant to be constructed on Rikers Island, in Queens. (See Marketplace section for project details.)

Throughout the state, a growing outreach program has Power Authority specialists working with the U.S. Department of Energy on technical workshops promoting energy efficiency measures for NYPA customers. These "Smart Power" technical courses help private businesses and not-for-profit organizations currently receiving NYPA allocations learn about specific actions they can take to cut their energy costs and usage.

The specialized and highly technical programs are just part of a larger ongoing educational effort NYPA makes to help all New Yorkers, from elementary students to senior citizens, understand how to use energy in a safer, smarter, more efficient manner.



*This page, from top: Western New York high schoolers participate in an annual Envirothon competition at the Power Vista. A poster contest, also at the Power Vista, helps young consumers better appreciate the many uses of electricity. And not far away, newly renovated Reservoir State Park provides improved playing fields for softball and other sports.*

*Opposite page: NYPA's new warm weather storage site for the Lake Erie-Niagara River Ice Boom will also include a small public park.*

## 2011 Action Item Highlights

Stakeholder Engagement	
Develop an environmental justice (EJ) action agenda	Based on NYPA's environmental justice (EJ) action agenda, an EJ implementation plan was initiated in 2011 and will be presented for approval to NYPA trustees in 2012.
Community Investment	
Continue to support community efforts that are related to NYPA's mission	Following more stringent reporting criteria, one dozen first-responder organizations in the vicinity of NYPA facilities received financial support to help maintain their emergency response operations.

## CASE STUDY: Improving Waterfront Access in Western New York

*The same water that is used to make hydroelectricity can be enjoyed through a variety of recreational pursuits. As part of the relicensing of its Niagara Power Project, NYPA spent much of 2011 creating new parks and improving existing recreational facilities in Western New York.*

*On the Upper Niagara River, for example, property that holds two 90-foot-tall intake structures for the Niagara project now includes amenities for anglers, cyclists and picnickers. The site's primary purpose is to divert Niagara River water upstream from the falls into underground conduits that carry this liquid fuel almost five miles to NYPA's Niagara project, which sits downstream from the world famous cataracts.*

*Working with the state Office of Parks, Recreation and Historic Preservation along with the Department of Environmental Conservation, NYPA enhanced the intake site with fishing shelters, picnic tables, bicycle racks and an information kiosk.*

*Another new park that serves a dual purpose was developed as part of NYPA's pledge to relocate its storage area for the Lake Erie-Niagara River Ice Boom. When not in use during the warm weather months, the ice boom used to sit on a waterfront site considered prime real estate on Buffalo's Outer Harbor.*

*After an extensive search, the Power Authority purchased a parcel in a more industrial area along the Buffalo River. The 10-acre site (see photo below) will contain both the ice boom and a maintenance facility along with a new 1.3-acre park, featuring a recreational boathouse and a canoe/kayak launch, ready for public use by Spring 2012.*

*The Niagara project relicensing also provided nearly \$6 million for renovations to Reservoir State Park, a 133-acre recreational site that sits adjacent to the hydropower project's 1,900-acre reservoir. Throughout much of 2011, improvements were made to the facility, including: new outdoor pavilions, a natural ice skating rink, refurbished tennis and basketball courts, resurfaced baseball and soccer fields, a handicapped-accessible playground, expanded parking and new landscaping.*





Photo left: A project to improve wildlife habitat on Grand Island today included an archeological dig to learn more about human inhabitants from centuries ago. Below: A new laser imaging camera is used to track releases of sulfur hexafluoride (SF<sub>6</sub>) gas during transmission maintenance.

# A SUSTAINABLE ENVIRONMENT

## Managing Resources With Respect

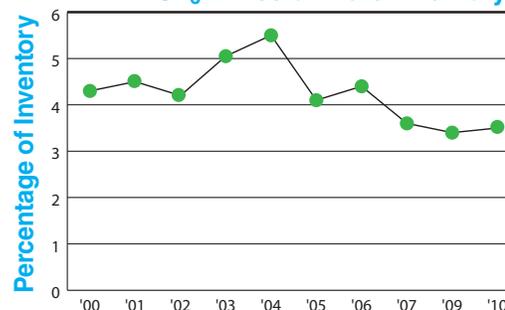
Hydroelectricity accounts for approximately 80 percent of NYPA's generation, making it one of the cleanest utilities in the country. The Power Authority is also committed to preserving and enhancing the natural resources in the vicinity of its facilities.



To this end, NYPA maintains an environmental division staffed by trained professionals at each major operating facility as well as its main administrative offices in White Plains. These employees work with regulators, contractors and the general public on a wide range of concerns, including air quality, water conservation, waste disposal, integrated vegetation management



NYPA SF<sub>6</sub> Emission Rate Inventory



The EPA's "SF<sub>6</sub> Emission Reduction Partnership for Electric Power Systems" goal is 6%

In 2008, NYPA switched its SF<sub>6</sub> data collection system and therefore did not file a report with EPA that year.

and wildlife habitats. Environmental employees also conduct in-house training programs for their coworkers in other areas of NYPA operations.

Spill prevention and response are critical concerns for NYPA, especially since much of its generation and transmission operations rely on oil-based products. In 2011, NYPA had 19 reportable oil spills, totaling 2,657 gallons. One significant event accounted for 2,200 gallons of the year's total.

### **Cutting Greenhouse Gases**

Monitoring and reducing NYPA's carbon footprint is an important part of the environmental division's efforts, with the Power Authority's active participation with The Climate Registry. Following the Registry's standard reporting practices, NYPA has compiled its data on greenhouse gas emissions for 2010, showing a 28 percent decrease in carbon dioxide from stationary combustion sources compared with 2009. The lower total—2,009,381 metric tons—is attributed to the cessation of operations of an 825-megawatt (MW) generating unit at NYPA's Poletti project in Queens, effective January 2010.

Sulfur hexafluoride (SF<sub>6</sub>), used extensively in electrical transmission equipment, has been identified by the U.S. Environmental Protection Agency as a highly potent greenhouse gas, with a global warming potential that is 23,900 times greater than carbon dioxide (CO<sub>2</sub>). One pound of SF<sub>6</sub> is equivalent to 11 tons of CO<sub>2</sub>.

In 2011, NYPA began using a new SF<sub>6</sub> laser imaging camera during transmission system maintenance to detect emissions of this colorless, odorless and extremely potent greenhouse gas. The Power Authority has also installed SF<sub>6</sub> sensors at remote substations that allow early intervention to minimize leaks while preventing possible equipment failures.

### **Clearing Rights-of-Way**

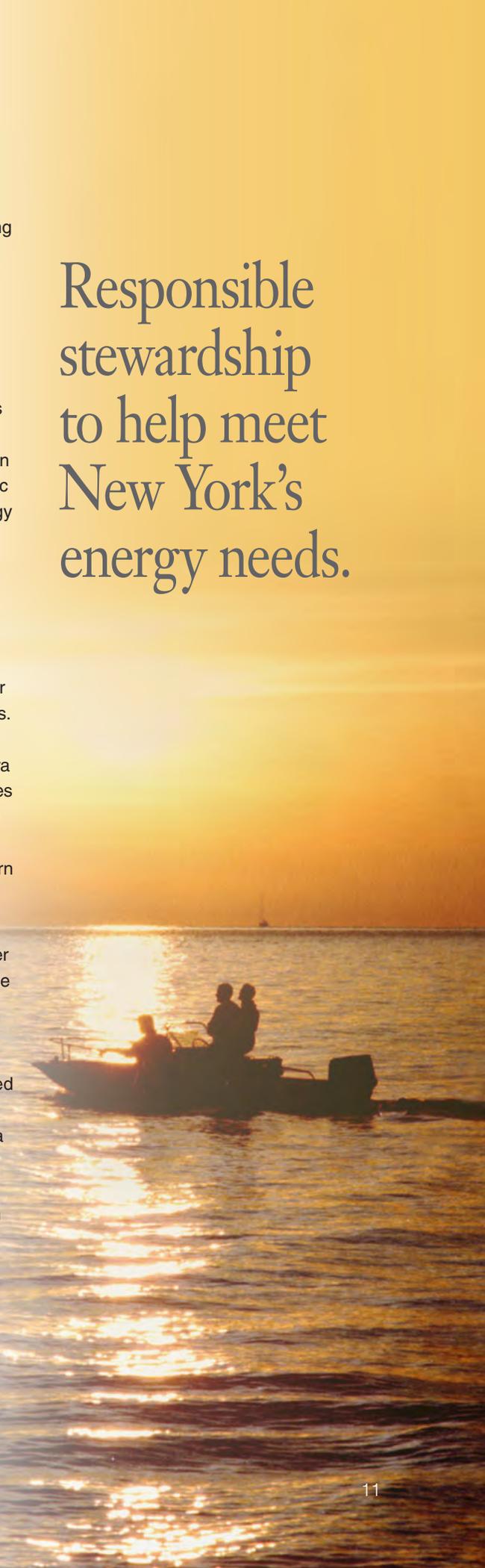
Besides maintaining its 1,400 circuit-miles of power lines, NYPA also manages the vegetation growing along its rights-of-way, which total about 16,000 acres. Selective trimming and minimal herbicide applications performed on a four-year cycle state-wide ensure greater plant diversity and a safer habitat for wildlife while keeping tall-growing trees and shrubs away from overhead power lines. In 2011, these practices earned NYPA an Environmental Award from the Electric Power Research Institute's Technology Transfer recognition program.

### **Waterfront Revitalization**

Relicensing agreements for two of NYPA's major hydroelectric projects have included commitments to help fund environmental enhancements for sensitive natural areas in their vicinities. These projects vary from financial support of Western New York's Niagara River Greenway, stretching the 35 miles between Buffalo and Lake Ontario, to habitat improvements and shoreline stabilization along 30 miles of Northern New York's St. Lawrence River.

For example, a Habitat Improvement Project (HIP) under way at Little Sucker Brook Pond in Waddington will provide improved drainage to encourage a more diverse ecosystem for this wetland adjacent to the St. Lawrence River. In 2011, designs were completed and the permitting process begun for this HIP, which will ultimately benefit a variety of fish, waterfowl, amphibians and reptiles. The project will also attract muskrat, which can perform an important role in restoring this area, since their foraging, burrowing and lodge construction will help control the overabundance of cattail that impede plant diversity.

In the Buffalo-Niagara region, the Power Authority worked with state parks officials to restore a wetland on



Responsible  
stewardship  
to help meet  
New York's  
energy needs.



2011 NYPA Facility Total Emissions	
Sulfur dioxide	12 tons
Nitrogen dioxide	218 tons
Particulate matter	131.62 tons

*This page, from top: Environmental projects near NYPA's large hydro facilities include tracking sturgeon migration along the St. Lawrence River and constructing common tern nesting platforms in the Niagara River. Right: The Niagara Power Project's new chiller saves energy and water.*

**CASE STUDY:  
Employees Find New Ways to Save Water**

*Water management is critical to environmental sustainability, so Power Supply staff at NYPA's main office in White Plains and its generating facilities statewide work together to protect this vital resource.*

*In 2011, Engineering staff collaborated with the Operations Department at NYPA's 500-megawatt combined-cycle plant in Astoria on a project to reclaim and utilize water that condenses from the air that feeds the facility's two combustion turbines.*

*Normally, the condensate from this air stream, known as "combustion air," would be discharged to the plant's drainage system. Instead, it is now captured and used to supplement the make-up water supply to the evaporative condenser water tank, reducing the amount of potable water consumed for this purpose by some 2.7 million gallons per year. Discharge to the drainage system has been reduced by the same amount. The purity of the condensed water has also reduced the need for chemical treatment typically required for these types of power generation systems.*

*Similarly, Engineering staff, assisted by Project Management, worked with the Niagara project's General Maintenance Department on an energy efficiency upgrade that also provides significant water savings. The original goal, in replacing Niagara's old water-cooled chiller and wet cooling tower with a high-efficiency air-cooled chiller system, was simply to remove equipment that had exceeded its useful life. However, the new system (see photo below) has delivered the added benefit of saving an estimated 7 million gallons of potable water a year while eliminating 1.4 million gallons of annual discharge into the sanitary system.*



Little Beaver Island, located on Grand Island. In the early 1960s, approximately 10 acres had been filled in and covered with a short mowed lawn that had little habitat value. Throughout 2011, NYPA oversaw removal of the fill and replacement of native plants that now attract a variety of wildlife. The project was recognized by the National Hydro-power Association for an Outstanding Stewards of America's Waters award.

Besides implementing its own environmental enhancements, NYPA is making additional relicensing funds available for special projects initiated by external groups working to protect

the St. Lawrence River ecosystem or promote a better understanding of this natural resource. A Technical Advisory Council comprised of local representatives will help allocate almost \$4 million for future HIPs now being solicited. And the community board responsible for a separate revenue stream, called the St. Lawrence River Research and Education Fund (SLRREF), has already disbursed some \$220,000 for 16 projects that benefit the local environment. Additional grants for research and education projects will be made over the 50-year lifespan of the St. Lawrence-FDR Power Project's renewed license.



*This page, from top: NYPA-funded relicensing improvements often benefit state parks, including Beaver Island State Park on Grand Island, and Coles Creek Marina in Waddington.*

## 2011 Action Item Highlights

Stakeholder Engagement	
We will manage our water resources efficiently and optimize conservation opportunities	Non-process water studies conducted to identify methods to reduce the use of potable water in non-process systems; recommendations were developed. (See case study, page 12)
We will reduce and manage our waste stream in an environmentally-responsible manner	Non-hazardous waste studies conducted to audit current practices and investigate ways to improve recycling, source reduction and waste minimization. Recommendations included a waste reduction target of 10 percent. (See Workplace section, page 4.)





*This page, left: Bronx Community College saves money with a new central heating plant.*

*Opposite page, below: The University at Buffalo's "Solar Strand" will power dormitories. Far right: A cogeneration plant is planned for Rikers Island.*

# A SUSTAINABLE MARKETPLACE

## Creating a Cleaner, Greener Economy

**In providing benefits** to every corner of the state, the Power Authority also maintains close working relationships with key stakeholders, including the participants of its various economic development and energy services programs.

In 2011, NYPA provided lower-cost electricity to 784 customers ranging from major employers that make possible family-supporting jobs to modest not-for-profit organizations that fill critical community needs.

State and local government entities also use NYPA to lower their costs and improve their efficiency.

### **Power to Grow Jobs**

In 2011, Power Authority electricity supported some 380,000 jobs, including more than 700 new positions created at private businesses and not-for-profit corporations. NYPA's Marketing and Economic Development staff members work in partnership with these customers, understanding their strategic needs and regional concerns while leveraging

Power Authority resources to best serve New York's overall economy.

For example, Remington Arms Company—the Mohawk Valley's largest employer—committed to hire 70 new workers as a result of a 3,250-kilowatt (kW) allocation approved by NYPA trustees in January. In business for almost 200 years, the firearms manufacturer announced a \$7.5-million upgrade and expansion that will bring its Ilion, N.Y., workforce to 970 employees.

Also in 2011, Gov. Andrew M. Cuomo signed into law the ReCharge New York Program, which will provide a mix of low-cost NYPA hydropower and market supply power to businesses and not-for-profits throughout the state. Allocations will be approved by the Power Authority starting in 2012 with input from regional economic development councils appointed by the governor. Outreach meetings were held statewide to help explain the new initiative, which will replace two existing NYPA programs: Power for Jobs and the Energy Cost Savings Benefit.

### **Efficiency Improvements Work**

However, low-cost power is just the beginning of NYPA's customer service offerings. Over the last two decades, the Power Authority has financed nearly \$1.5 billion in energy efficiency and clean energy initiatives at more than 3,800 public facilities, resulting in annual savings of more than \$139 million and reduced greenhouse gas emissions of nearly 837,000 tons a year.

### **A Variety of Projects**

NYPA energy services projects can be found in a variety of public facilities.

In 2011, the Albany Times Union Center received \$1.5 million in energy efficiency improvements that will result in annual savings of more than \$150,000 while reducing carbon dioxide by 860 tons per year. Federal stimulus funds totaling \$500,000 will help cut the project's payback time from almost seven years to just over four years.

School districts and other academic institutions have also sought out Power

## CASE STUDY: Cogeneration Project Promises Multiple Benefits

Authority assistance and expertise to help lower their operating costs. For example, at the College of Staten Island, a \$19.8 million project that replaced the school's heating, ventilating and air conditioning system, promises to lower fuel costs by \$900,000 a year while reducing carbon dioxide emissions by an annual 4,110 tons. A \$3.3 million job for the South Glens Falls Central School District that includes lighting upgrades and boiler replacements will save more than \$200,000 yearly while avoiding release of 881 tons of greenhouse gases.

And at Cayuga County Community College, NYPA has undertaken a \$342,000 project that includes energy efficient gym lighting plus a rooftop solar installation that will cut energy costs by \$15,000 a year and prevent 78 tons of pollutants from entering the air.

The Power Authority continues to implement solar photovoltaic power projects of varying sizes throughout the state. Recently completed efforts include a 250-kW system at a Niagara Frontier Transportation Authority garage in Buffalo and a 124-kW installation atop the Westchester County Office Building in White Plains.

Also in 2011, construction proceeded on a 750-kW array known as the "Solar Strand" on the grounds of the University at Buffalo's Amherst campus. When completed in 2012, this NYPA-funded project will be the largest solar installation on any college campus in New York and will bolster the school's goal of carbon neutrality while providing enough electricity to power about 700 student apartments.

Besides developing customer-sited renewable energy projects, NYPA also buys "green power," in the form of Renewable Energy Credits (RECs), from new and existing grid-connected facilities to meet the compliance obligations and voluntary goals of its customers.

By aggregating demand among participants of its green power program, NYPA can minimize the cost to its customers while supporting the development of new facilities through purchase agreements with renewable energy developers. These agreements help clear the way for financing of these clean energy projects. In 2011, NYPA provided over 220 gigawatt-hours of green power RECs to its customers.



*As 2011 was drawing to a close, the Power Authority was preparing for the start of its largest cogeneration project to date, a 15-megawatt (MW) natural gas generating unit planned for the Rikers Island prison complex in New York City.*

*NYPA was approached by the city's Office of Energy Conservation in 2006 to help the Department of Correction resolve a variety of energy issues at the East River facility.*

*Problems with a 50-year-old boiler plant were resulting in power outages at the prison along with unsatisfactory levels of greenhouse gas emissions in the surrounding neighborhoods, including officially recognized Environmental Justice communities. (See Community section for details.)*

*A Customer Installation Commitment was signed in September, paving the way for the \$104 million project that will provide a new powerhouse on Rikers Island containing two 7.5-MW natural gas turbines with heat-recovery systems to help meet both electrical and thermal demand by 2014.*

*Benefits will include major reductions in annual emissions of carbon dioxide (22,000 tons) and nitrogen oxide (37 tons), significant improvement in electric service reliability for Rikers Island and creation of green jobs during project construction.*

*The project will also save New York City about \$7 million in annual energy costs.*

New York City Department of Correction





*This page, left: Shaun Hession, deputy director of general services for the New York City Housing Authority (far left), accepts an electric delivery truck from NYPA staffers (starting second from left) Ruth Colon, Guy Sliker, Sobeida Cruz and Peter Giasemis.*

*Below: Energy efficiency improvements are helping the Albany Times Union Center save more than \$150,000 a year on its utility bill.*

Two new wind farms being developed upstate by EverPower Wind are an example of this. The Howard Wind project in Steuben County, which began operations in late 2011, consists of 25 turbines that will generate almost 128,000 megawatt-hours (MWh) a year. The Alleghany Wind project, in Cattaraugus County, will produce about 154,600 MWh a year once its 29 turbines are installed by the end of 2012. NYPA has contracted to purchase a small portion of the RECs generated by both wind farms.

The Power Authority continues to explore the feasibility of offshore wind projects as well, specifically through its participation in the Long Island-New York City Offshore Wind Collaborative, which consists of NYPA, Con Edison and the Long Island Power Authority. In 2011, the Collaborative submitted a lease application to the federal government for undersea land in the Atlantic Ocean that has been identified as a possible location for an offshore wind project between 350 MW and 700 MW in size.

Alternative energy projects are not without their challenges, however. Even as the downstate offshore wind initiative moved forward, NYPA trustees voted in September to end the competitive solicitation process for the Great Lakes Offshore Wind (GLOW) proposal without awarding a contract for project development due to unfavorable economic considerations.





*This page, above: A new boiler/chiller is delivered to the New York Institute of Technology. An EverPower Wind turbine is ready for action.*

*Left: New York City Mayor Michael Bloomberg unveils all-electric and extended-range electric vehicles co-funded by NYPA.*

### Promoting Electric Vehicles

Electric-drive vehicles are yet another item on NYPA's customer service menu. The Power Authority helps governmental entities demonstrate the benefits of clean transportation by providing financial assistance for purchases.

In 2011, NYPA co-funded the purchase of 50 Chevrolet Volt extended-range electric vehicles and 10 Ford Hybrid Transit Connect electric vans for nine New York City departments. NYPA also contributed to the purchase of hybrid shuttle buses for the villages of Tarry-

town and Hastings, which will use the vehicles to provide community outreach services to senior citizens. In each case, NYPA works with fleet managers to evaluate vehicle performance, thus contributing to the growing body of knowledge on electric vehicle technology.

## 2011 Action Item Highlights

Demand-Side Management	
Continue to provide turnkey energy efficiency services, including consulting, financing and project management	NYPA exceeded its 2011 energy efficiency investment target and completed 74 projects that collectively save customers 78,681 MWh.
Renewable Energy	
Increase distributed renewable energy generation in New York State	NYPA completed solar energy projects in Buffalo, Niagara Falls, Amherst and at several locations in Westchester County and on Long Island. Maintenance work on a fleet of fuel cells will extend their working lives.
Formalize and promote NYPA's ability to offer green power and credits to its customers	NYPA started a streamlined procurement program for green power customers.
Foster utility-scale renewable energy generation capacity in New York State	NYPA agreed to purchase power from two new upstate wind farms, and is collaborating with LIPA and Con Edison to advance an offshore wind project.



*This page: A turbine-generator at the St. Lawrence-FDR project is replaced.*

*Opposite page, from left: A Ford Electric Connect van joins NYPA's fleet, while a turbine-generator at the Flynn plant is overhauled.*

# SUSTAINABLE OPERATIONS

## Meeting the State's Power Supply Needs

**The Power Authority supplies** up to one-quarter of New York State's electricity from its 17 generating facilities and economical power purchases. That duty to provide clean, dependable, lower-cost power is NYPA's single most important obligation, and part of its legacy. In fact, then-Gov. Franklin D. Roosevelt's commitment to put water power to work for New York's people in 1931 became the model for much larger water-driven electric power systems in the southeastern and northwestern United States.

In recent years, NYPA has held celebrations marking 50 years of generation at its two largest hydroelectric facilities: the St. Lawrence-Franklin D. Roosevelt Power Project, in Northern New York, and the Niagara Power Project, in Western New York. These anniversaries were observed within a few years of the federal relicensing of both projects, ensuring their place in the state's energy mix for at least another 50 years.

The original 50-year license for NYPA's third large hydroelectric station, the Blenheim-Gilboa (B-G) Pumped Storage Power Project, in the Northern Catskills, will expire in 2019. Plans to relicense that facility are currently under development.

To maintain reliable and efficient operations at all three of its large hydropower projects, the Power Authority has undertaken a series of major upgrades to replace or refurbish just about every important piece of equipment in these vital assets.

### **Power for the 21st Century**

Most recently, a nine-year, \$460 million Life Extension and Modernization (LEM) has begun on the Lewiston Pump-Generating Plant (LPGP), which is part of NYPA's Niagara project. Preliminary work began in 2011 with the replacement of four generator step-up transformers, known as GSUs, that serve LPGP. Starting in late 2012, all 12 of the plant's pump-turbines will be replaced with new equipment. (See case study, page 21, for further details on NYPA's pumped-storage operations.)

Also in 2011, NYPA entered the final stages of a 15-year, \$281 million LEM at its St. Lawrence-FDR project. The 14th of that facility's 16 turbine-generators was replaced along with associated components. That LEM remains on schedule for completion by 2013.

As important as NYPA's hydropower assets are in producing economical electricity, just as critical is the Power Authority's transmission infrastructure, stretching some 1,400 circuit-miles across the state. In 2011, plans for a transmission LEM began to take shape with system-wide assessments conducted and reams of data analyzed, leading to development of a long-term strategy for this major undertaking. Meanwhile, a capital program to replace critical components is also under review.

At the same time, routine maintenance and high-tech improvements are being made in NYPA switchyards and along transmission line rights-of-way.

### High-Tech Help for Aging Infrastructure

In cooperation with the Electric Power Research Institute (EPRI), the national utility industry research organization, programs to help ensure longer transformer and reactor bank life were initiated in 2011. The Power Authority is testing filtration equipment, which removes moisture and sulfur dioxide from transformer oil, at its St. Lawrence-FDR project up near the Canadian border. A similar effort is under way at Con Edison's Sprain Brook substation in Westchester County, starting point for NYPA's Sound Cable, which carries electricity to Long Island.



## NYPA's Generation Assets

	Installed Capacity (MW)	Net Energy Output (GWh)	Average Plant Availability (% of hours available to produce power/8760)	Forced Outage Factor (# of outage hours/8760)	Average Power Outage Duration (# of outage hours/# of outages)	Average Thermal Heat Rate (BTU input/kWh output)
<b>Hydro Facilities</b>						
St. Lawrence-FDR	912	7,285	94.8	0.8	9.8	N/A
Niagara	3,095	14,012	91.8	2.3	77.5	N/A
Blenheim-Gilboa	1,160	(98)	89.3	0.4	5	N/A
Small hydro plants	73	179	91.8	34.7	73.7	N/A
<b>Natural Gas/Oil Facilities</b>						
500 MW	529	3,036	92.3	5.3	14.7	7,410
Flynn	167	1,061	82.2	0.1	259.7	7,795
Small Clean Power Plants	517	586	91.1	13.6	8.8	10,698

The new filtration system helps maintain maximum transformer and reactor bank oil dielectric strength over time, lengthening useful life spans. Online dehydration equipment has been installed to prevent oil degradation from heat, oxygen, moisture and other contaminants by removing these and other particulates while the transformer is in service.

### More Smart Grid Advances

The number of “smart grid” enhancements made to the Power Authority’s transmission system increased in 2011 as well. A technologically advanced monitoring system—Dynamic Thermal Circuit Ratings (DTCR)—introduced in 2010 to measure thermal conditions and guard against overheating of transmission lines, was expanded. DTCR’s field instrumentation and software will more accurately measure line conditions that are influenced by the amount of electricity being transmitted, as well as outside temperatures, humidity and wind speed. Teaming with EPRI, NYPA hopes to increase line capacity between 5 and 15 percent on DTCR-monitored lines, contributing to lower energy costs and increased system flexibility, without compromising reliability.



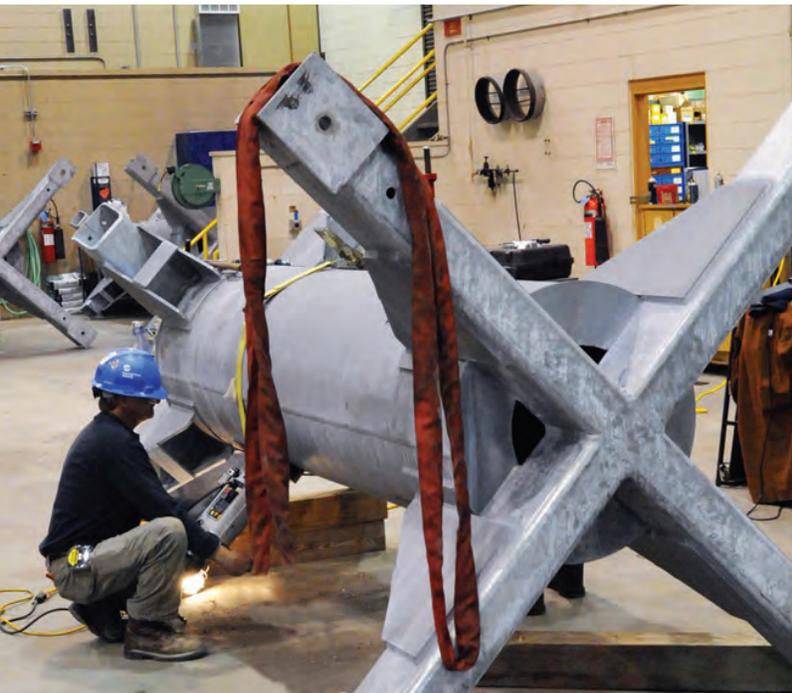
The technology is expected to help the Empire State’s transmission system better distribute the output of growing wind power sources throughout New York.

Also in 2011, NYPA expanded installations of Global Positioning System-synchronized measurement devices at its transmission substations. Another smart grid initiative—Phasor Measurement Units (PMUs)—provide faster, more accurate real-time data measuring voltage and current, which can alert operators to the potential for imminent disturbances in the system, and permit instantaneous response to prevent or minimize damage.

### Maintenance Takes Flight

Spacer dampers, which separate power line conductors while controlling oscillation and dampening vibration, are especially important in protecting multiconductor bundle systems from the effects of wind and ice. In the past, replacement of these devices was usually scheduled when power lines were taken out of service, during which time crews performed the labor-intensive operation after climbing up transmission towers 100 feet tall or higher.

Recently, the Power Authority has employed a new strategy in which helicopters carefully hover within inches of live power lines so that specially trained linemen wearing customized, protective suits, can make repairs while tethered securely



## 2011 Action Item Highlights

### Generation and Transmission Efficiency

**Integrate smart grid technology into NYPA’s transmission system**

A project to site Phasor Measurement Units (PMUs) was completed successfully, and the locations determined were provided to the NYISO to be utilized at the rest of the substations in the state grid. The Willis substation PMUs and supporting equipment were purchased for installation by St. Lawrence-FDR staff in 2012. The Dynamic Thermal Circuit Rating project continued with data collection and analysis.

Opposite page, bottom: NYPA employees are working smarter and safer with each major improvement project.

Top: A contractor performs specialized aerial transmission line maintenance.

This page, bottom right: The Niagara project consists of two generating facilities: the Robert Moses Niagara Power Plant, shown in the foreground, and the Lewiston Pump-Generating Plant (LPGP), in the background, next to Lewiston Reservoir.

to the helicopter skids where they are perched. The aerial procedure has proven to be considerably safer than the traditional, tower-based method, with the added benefit of avoiding expensive power line outages. It also helps prevent the environmental damage caused by trucks traveling over unpaved rights-of-way.

To better manage its automotive assets and lessen its carbon footprint, NYPA conducted a Green Fleet Study that inventoried the types of vehicles used for various operational functions. While vehicle purchasing decisions are weighed against both internal and external constraints, including the alternative fuel vehicle purchasing requirements of the federal Energy Policy Act, several recommendations were made as a result of the study. These include increased use of biodiesel fuel and additional purchases of hybrid-electric and plug-in electric vehicles.

### Adapting to Climate Change

Preparing for and responding to potentially dangerous conditions is critical for any entity providing essential public services. In 2011, the Power Authority’s working group on Climate Change Adaptation continued to identify and prioritize potential threats to critical infrastructure, and completed its review of NYPA’s Central Region and state-wide transmission system.

## NYPA’s Transmission Assets (in kilovolts)

	Underground (circuit miles)	Overhead (circuit miles)	Total
<b>115kv</b>	1.67	34	35.67
<b>138kv</b>	3.16	0	3.16
<b>230kv</b>	0	334	334
<b>345kv</b>	43	940	983
<b>765kv</b>	0	104	104
<b>Total</b>	<b>47.83</b>	<b>1412</b>	<b>1459.83</b>

## CASE STUDY: Water-Powered “Battery” Generates Extra Juice

New York State has two pumped-storage hydropower projects, and both are owned by the Power Authority. The larger of the two, known as Blenheim-Gilboa, completed a Life Extension and Modernization (LEM) in 2010. That same year, a similar LEM was announced for the Lewiston Pump-Generating Plant (LPGP), a pumped-storage facility that is part of NYPA’s Niagara Power Project.

In 2011, the first in a series of contracts for the \$460 million Lewiston overhaul was awarded by NYPA trustees, with initial engineering and switchyard upgrades marking the start of this nine-year undertaking. All 12 of the plant’s pump-turbine generator units will be replaced along with other major components beginning in 2012.

LPGP enables NYPA to use Niagara River water twice in the generation of hydroelectricity. A 1950 treaty with Canada specifies how much water may be drawn from the Upper Niagara River and diverted through underground conduits to NYPA’s hydro project, about five miles downstream from Niagara Falls.

During times of low demand, such as nights and weekends, the diverted water is pumped up into Lewiston Reservoir, which serves as a 22-billion-gallon “storage battery” holding this liquid fuel in reserve. During peak demand, LPGP’s pumps allow the reservoir water to flow back through the power plant, spinning turbine-generators that make electricity.

After the water flows through the Lewiston plant, it continues through a forebay and then into the Niagara project’s main power dam, called the Robert Moses Niagara Power Plant, which generates additional amounts of electricity with its 13 turbine-generators. Together, both plants can produce more than 2,440 megawatts, making the Niagara project the largest generating facility in the state.



# About NYPA

The New York Power Authority (NYPA) is a public authority and the country's largest state power organization. NYPA operates 17 generating facilities, of which nearly 80 percent of the output is sourced from renewable hydropower, and over 1,400 circuit-miles of transmission lines. NYPA provides up to one-quarter of New York State's electricity from its generating facilities and economical power purchases. NYPA sells power to governmental agencies, community-owned electric systems and rural cooperatives, and to business customers that support almost 380,000 jobs in New York. NYPA also provides power to private utilities for resale, without profit, to New York State ratepayers, and to neighboring states, as provided by federal requirements.

NYPA is overseen by trustees who are appointed by the Governor and confirmed by the State Senate. Individuals serving on the seven-member board are independent and non-executive. Standing trustee committees include audit, governance and finance. Trustees meet approximately 10 times a year or more frequently if necessary.

## In 2012, NYPA will continue to...

- **Lead** by example with sustainable practices and operations
- **Develop** energy efficiency and renewable energy programs to advance the state's clean energy goals
- **Support** our employees in their efforts to adopt and promote green practices
- **Partner** with our customers to implement clean technology and energy efficiency projects that help them achieve their sustainability targets
- **Engage** with communities where we operate to support sustainability and community development
- **Report** publicly on progress made implementing our Sustainability Action Plan...

...and more.

This 2011 Sustainability Annual Report was produced entirely in-house by NYPA's Corporate Communications staff. Only a limited number were printed using 100% recycled paper. Interested readers may view this 2011 annual report, along with our award-winning 2010 report, online at [www.nypa.gov](http://www.nypa.gov).



[www.nypa.gov](http://www.nypa.gov)

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\*Partial Reporting

<sup>^</sup>2010 data

\*See the NYPA 2011 Annual Report for this information.

