Public power. Personal stories. Always innovating.

2016 YEAR IN REVIEW

NEW YORK STATE OF OPPTUNITY NY Power Authority
The best way to tell NYPAs 2016 story is with our employees’ words.

We asked them to write Six-Word Stories about their experiences.

You’ll find them throughout this Year in Review.
A message from the President and CEO

Dear fellow New Yorker,

Gov. Andrew M. Cuomo set significant goals with his Reforming the Energy Vision to make energy more reliable, cleaner and affordable, and for New York State to reduce its energy use 30 percent by 2050 through his Clean Energy Standard. The New York Power Authority (NYPA) is helping move these objectives forward in ways that are as innovative as any in public power.

Our future vision: All-digital utility.

— Gil C. Quiniones, President and CEO

As you can see from my Six-Word Story, above, we are fully embracing the advantages of digitization. By accessing in-depth, actionable information about our facilities and those of our customers, our operations are more efficient and resilient.

Guided by the six initiatives in our Strategic Vision 2020, and told here through the Six-Word Stories of my dedicated colleagues, we are on the forefront of utility innovation. We are bolstering NYPA’s generation and transmission through the Asset Management initiative. Under the Smart Generation & Transmission initiative, new digital technologies are being incorporated. The Customer Solutions initiative provides our customers with low-cost, clean, renewable power and ways to reduce energy use. We are advancing our business practices and investing in our employees with initiatives in Workforce Development, Process Excellence and Knowledge Management.

The innovations needed to achieve these initiatives involve bright minds, hard work and risk. Risk Management and Internal Audit teams at NYPA provide checks and balances to transform our risks into opportunities that enhance our value to the state and our customers.

NYPA’s accomplishments in 2016 were made possible by the work of our talented employees. It benefits all New Yorkers, as reflected in three important milestones:

• The Marcy South Series Compensation Project was completed. It is the first project of its kind in the Northeast and perfectly showcases NYPA innovation. We upgraded existing infrastructure and used high-tech improvements to bring a mid-sized power plant’s worth of electricity from upstate to meet needs downstate, with no additional transmission lines and for far less cost than a new power plant.

• With the opening in 2016 of New York Energy Manager (NYEM), participating customers now have digital energy data at their fingertips to make savvy, informed decisions. With NYEM, we’re building a “digital foundry” and creating an ecosystem where utilities, research institutions and others can conduct research, and develop new apps and services to drive innovation for our customers.

• If you visit Niagara Falls, please see the totally renovated Niagara Power Vista, the visitors center for our Niagara Power Project—which generates the largest amount of electricity in New York State. The new interactive exhibits and breathtaking views will captivate your whole family.

NYPA and the Canal Corporation

There is a new member of the NYPA family—the New York State Canal Corporation. Many NYPA and Canal employees were involved in the monumental task of joining two historic state entities on Jan. 1, 2017, when the Canal Corp. became a NYPA subsidiary. We will work with the Canal Corp. to improve efficiencies and identify ways to enhance its recreational features especially during 2017—the bicentennial of the start of construction for the Erie Canal.
Our Marcy South Series Compensation Project (MSSCP) is more remarkable for what it doesn’t include than what it does.

It added enough transmission capability on our Marcy South line to power about 400,000 mid-sized homes. And it was accomplished without building a new power plant or new transmission lines—pricey alternatives that would have been unavoidable in the past, but that today are being muscled aside by technology and innovation.

Completed in summer 2016, after less than a year of construction in partnership with New York State Electric & Gas (NYSEG), the $120 million project is the first of its kind in New York State. MSSCP relieves transmission congestion—or bottlenecks—that affects the ability to deliver upstate electricity to the heavily populated downstate region, including Westchester County, New York City and Long Island.

NYSEA and NYSEG installed three capacitor banks—each about 30 feet wide, 60 feet long and two stories high—two at NYPA’s new Fraser Annex substation in Delhi, Delaware County, and one at NYSEG’s Fraser substation—to allow greater control of power movement. NYPA’s capacitor banks support 135 miles of lines from Marcy, Oneida County, to Rockland, Sullivan County.

These banks, never before used in New York State, are estimated to increase power flow on 345-kilovolt (kV) transmission lines by as much as 440 megawatts (MW). That’s equivalent to a mid-sized power plant.

MSSCP is bringing surplus upstate energy from clean, renewable sources such as wind power and NYPA hydropower. This also addresses Governor Cuomo’s Reforming the Energy Vision to build an energy system that is more efficient, resilient and affordable. MSSCP also gives operators greater awareness of transmission conditions so power can be dispatched more effectively to where it’s needed most.

Dramatic change in power transfer capability.

— Ali Mohammed, Associate Project Engineer

Pulling conductor: Amplified capacity, compounded capabilities.

— Jordi Parisian, Senior Transmission Engineer I

More power delivered via MSSC Project.

— Bruce Farandesh, Chief Electrical Engineer

Success and major accomplishments through great teamwork.

— Daniella Piper, Project Manager, Transmission

Collaborative departmental teamwork produces successful project.

— Len Walker, Procurement Manager

Above and next pages: NYPA crews work on the Marcy South Series Compensation Project at Frederick R. Clark Energy Center, Marcy.
We accepted. We executed. We succeeded.

— Mark Leo, Transmission Supervisor

MSSCP plugs in, pushes power downstate.

— Patricia Meehan, Manager, Project Development & Licensing

Extensive collaboration, unforeseen challenges, realized benefits.

— Jeffrey Geller, Senior Licensing Specialist

Four years: Planned, engineered, constructed, operational.

— Sunil Kumar Palla, System Planning Engineer

Series compensation: More power for less.

— Ro Valvano, Senior Project Estimating Engineer

Cultivating positive relationships with local stakeholders.

— Mario Roelfso, Central New York Community Relations Manager

My lineman brothers have my back.

— Todd Jones, High Voltage Hotstick Lineman

‘Beyond Energy to Synergy’

Todd Jones, a high voltage hotstick lineman, provided this first-person account of working on the Marcy South Series Compensation Project.

NYPA’s managers knew they had the talent on staff and much of the equipment necessary to perform the Marcy South Series Compensation Project upgrade work at NYPA’s Frederick R. Clark Energy Center switchyard. It would have been easy to hire an outside firm, but keeping the work “in house” was a tremendous vote of confidence in our abilities, and morale was high from the start.

All that was lacking was some specialized equipment used to pull in new wire, and it could be easily rented for a few weeks. Following a day of training on the rented wire tensioner/puller, it was time for business. I and the other linemen involved in this project knew the future of keeping similar work in our hands was riding on the project’s outcome. We committed to do whatever it took to finish the project on schedule.

Installing new wire had its share of setbacks. As with any physically intensive venture, line work rarely goes off without a hitch. Despite considerable discussion and planning, this project was no exception.

April 2016 brought one last winter thrashing to Central New York, and its misery bore directly on our work schedule. Ropes broke. Machinery refused to start. Chain hoists and rigging froze solid in icy storms, and had to be replaced with units retrieved from heated storage.

As is typical, each challenge was met with frustration, then serious head scratching and, ultimately, viable solutions to push the project forward.

Linemen worked in the dark and through weather that would have shut a routine project down. Even with the uncooperative conditions, our work was completed three days ahead of the 15-day critical schedule.

This story would not be complete without mentioning the fleet mechanics who never fail to breathe life back into dead equipment. The incredible talent wiggling from their numb fingers allowed our group to shine, and they were indispensable on this project.

For all its technical wizardry, the most constructive results of the Marcy South Series Compensation Project go beyond energy to synergy, and the great things that can be accomplished when NYPA managers work to engage their own International Brotherhood of Electrical Workers members for the common good of New York State residents.
Very carefully...that’s the way you move a 192-ton autotransformer...and especially when you move seven of them. That’s like 93 minivans measuring 547 feet high and 33 feet wide. Precision technology like that used to move NASA Space Shuttles was needed.

In 2016, NYPA completed a $32 million replacement of all seven autotransformers, some of which were 40 years old, at our Massena Substation. Transporting state-of-the-art transformers for this replacement was a massive undertaking. Each unit arrived at different times and had to be monitored throughout the journey to avoid excessive shock and/or damage.

When the units arrived in New York Harbor, transportation north was limited to designated rail lines. Upon arrival at the Massena Substation rail yards, the autotransformers were loaded onto a remote-controlled, custom-built transport trailer similar to ones used to move a NASA Space Shuttle. Workers walked alongside the trailer as the units traveled from the Massena train rail yard to our Massena Substation. All arrived safe and sound with the last put into full operation in March 2016.

Autotransformers are used to step up or step down voltage so electricity can travel efficiently and reliably over power lines. The operation of NYPA’s autotransformers is essential to the flow of electricity from our St. Lawrence-Franklin D. Roosevelt Power Project to more congested areas downstate.

Demolition of the original autotransformers, new design, procurement and installation of the new equipment took months, and involved experts from many NYPA business units. The project is part of NYPA’s Transmission Life Extension and Modernization, a multiyear effort to improve our transmission facilities statewide.

When it comes to safety, one of the goals is to NOT break anything...unless it’s a record for consecutive injury-free days.

That’s what happened in 2016 at our St. Lawrence project in Massena. The project’s roughly 240 employees went 759 days without a DART (Days Away, Restricted or Transferred) incident, meaning no job-related injuries or illnesses serious enough to miss work or affect activities.

It was the longest DART-free stretch at NYPA since at least the early 1980s and a testament to the project’s dedicated employees. Many of them work in settings that could put them at risk of injury, including those who work outdoors in less-than-ideal conditions like Northern New York’s often-treacherous winters. The streak ended in October when a worker required medical treatment for a sprained ankle.

Management and members of the International Brotherhood of Electrical Workers Local 2032 celebrated the 759-day milestone as an example of fostering a culture of safety at NYPA. Each St. Lawrence project employee—from electricians and mechanics to support staff and office workers—received a shirt commemorating the streak.

A testament to our safety commitment.
— Calvin Smith, Safety, Health and Fire Protection Administrator

When Record Breaking Means Nothing Broke

At the St. Lawrence-Franklin D. Roosevelt Power Project, Massena, in shirts commemorating a 759-day streak without an injury or illness serious enough to miss work.
There’s a virtual underwater police officer monitoring traffic and issuing warnings to wayward vessels. That’s a strange image, but it captures the concept behind a new technology NYPA is using to protect its transmission lines.

NYPA operates an underwater transmission line, the Long Island Sound Submarine Cable System (Y-49), consisting of four cables. It moves power from upstate generators to Long Island, and is key to the reliable and safe delivery of electricity. Twice, the line suffered crippling damage from anchors lowered from ships that resulted in cuts to a cable. An anchor strike in 2014 forced the line out of service and required millions of dollars in repairs.

The Sound cables are a small but critical part of NYPA’s transmission assets. In 2016, NYPA deployed a system that combines safety-driven messaging, virtual automatic identification system beacons and a web-based software program, at a fraction of the cost of even one anchor strike.

The technology for operating the system, called Guardian:protect, automatically alerts NYPA when a ship’s behavior indicates a potential anchoring situation near Y-49. It then transmits a safety message directly to the vessel’s onboard navigation system. In parallel with this feature, Guardian:protect incorporates virtual beacons marking the location of the cable field path. The signals sent by the virtual beacons also appear on marine navigation systems and caution navigators that they are operating in a cable field.

On land or under the sea, New Yorkers can be confident that NYPA is always pioneering new ways to use advanced technology to improve the reliability and efficiency of all of our transmission assets.
In exchange for low-cost power or loans, NYPA’s economic development program customers signed agreements in 2016 that—combined—would be equivalent to:
• Creating or retaining nearly 1.1 jobs EVERY HOUR
• Securing about $52,000 in capital spending EVERY HOUR

This was accomplished with just 21 MW of NYPA electricity—or about 60 kW a day, which is what it takes to power 48 to 60 average-sized homes.

So you can see, NYPA power once again provided a significant jolt to employment levels and capital investments in New York State.

Most of the 2016 job and capital spending commitments came from ReCharge NY (RNY), one of Governor Cuomo’s signature economic development programs that NYPA administers. RNY made 84 allocations during the year, totaling 18.7 MW, to 68 businesses and not-for-profit facilities in return for commitments linked to more than 5,900 jobs and in excess of $352 million in capital spending.

Other 2016 program highlights included:

Hydropower
• Allocations totaling 1.5 MW of Replacement Power from our Niagara Power Project went to three Western New York businesses, supporting the creation of over 380 jobs and more than $14.3 million in capital investment
• A 400 kW Replacement Power allocation was awarded to Geico in Erie County, supporting 300 new jobs, 2,600 existing jobs and $6 million in capital spending

Equivalent to nearly 1.1 jobs every hour
In the digital age, the amount of information we process on a daily basis is big—in fact, so big it’s known as Big Data. To make sense of it all, we have to sort through it quickly, separating out what matters and what is simply “noise.” Then we have to figure out what’s essential. Without this understanding, it is simply impossible to make good decisions.

The opening of New York Energy Manager (NYEM) in 2016 demonstrates NYPA has tamed the digital beast by harnessing the power of Big Data and deep analytics. NYEM’s digital tools help New York State buildings substantially improve efficiency and drive down energy costs. NYEM is the cornerstone of Governor Cuomo’s BuildSmart NY, a program on track to reduce energy use in state-owned buildings 20 percent by 2020.

• A 600 kW Preservation Power allocation from our St. Lawrence project was awarded to Roth Industries USA in Jefferson County, supporting 14 existing jobs, eight new jobs and $6.7 million in capital spending

Western NY Economic Development Fund

• More than $6 million in awards were recommended by the Fund’s board and approved by NYPA for 10 businesses that will create or retain 264 jobs and generate $64.6 million in project investment

North Country Economic Development Fund

• A $500,000 working capital loan was approved for St. Lawrence Zinc in St. Lawrence County. The project has the potential to create 123 jobs and retain seven jobs

• A $100,000 loan was approved for L.K.R. Enterprises in Star Lake, St. Lawrence County. The project created 12 jobs

• A $300,000 loan was provided to North Woods Lodge and Resort in Old Forge, Hamilton County, creating approximately 30 jobs

• A loan for $300,000 was approved for Swan Bay Resort & Marina, in Alexandria Bay, leveraging an additional investment by the marina of $459,300. The project is expected to create 10 jobs

• A $300,000 award was committed to Roth Industries as part of a $3.2 million expansion project in Watertown. Roth also received a 600 kW Preservation Power allocation toward the expansion that is expected to retain 14 jobs and create eight jobs

RNY: Five years and going strong.

— Ylle Brown, Business Power Allocations & Compliance Analyst II

When I work, people get jobs.

— John Paine, Lead Power Contracts Analyst

We strategized, innovated, implemented and achieved!

— Maribel Cruz-Brown, Manager, Business Power Allocations & Compliance Manager

When I work, people get jobs.
Instructions for the Blippar Augmented Reality Experience

**DOWNLOAD**
Download the free Blippar app at the Apple or Android store to explore our augmented reality experience.

**AIM & FRAME**
Aim smart phone or mobile device over smart building illustration at right.

**WATCH**
It might take a moment for Blippar to load illustration depending on your internet connection.

**Hint:** move phone or device closer in or further out to find live area.

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Look Inside a Smart Building With Your Smart Phone

Using Blippar, Take an Animated Look With Your Smart Phone or Mobile Device.
With accurate energy-use data, you can understand a problem, measure it, control it and then make decisions to optimize efficiency and savings. That’s the main concept behind NYEM. The power is put back in the hands of the customer with no guesswork.

NYEM is comparable to a “digital foundry”—a data-driven central repository to foster innovation, and accelerate the adoption and interconnection of smart devices. Using smart meters and system-level sensors, NYEM receives energy information from more than 1,000 buildings statewide including public colleges, hospitals and correctional facilities at its hub in Albany—the state’s first energy Network Operations Center (NOC).

The system analyzes the secure data to provide actionable information to building engineers via visual dashboards, on a desktop or mobile device, that can be seen simultaneously by NYEM energy engineers at the NOC. The dashboard provides an accurate picture of a facility’s energy performance by monitoring parameters such as electricity, natural gas, steam, hot water use and room temperatures.

Smart meters and sensors collect energy data from a variety of building systems—lighting, chillers, boilers and onsite generation such as roof-mounted solar panels. Building engineers can make informed decisions about modifying energy use in real time and can consult with NYEM staff for input. It also helps customers identify trends in energy use that can be used to do predictive maintenance and justify long-term capital investments for reducing energy use.

NYEM’s data and analytics software are more than a technical breakthrough. They also help reduce greenhouse gas emissions—a major contributor to climate change. As electric consumption drops, the need to generate more power also goes down. The result is an overall reduction in carbon gas emissions and a cleaner environment.

Measure it first. Then improve it.
— Mohan Vaidya, Senior Engineer, NYEM

Turning actionable intelligence into addressable savings.
— Joe O’Connor, Senior Project Specialist, NYEM

Smart meters: In data we trust.
— Arun Vedhathiri, Manager, NYEM

ENERGY SERVICES IMPLEMENTATION

88
projects completed

$284 million
in financing for customers

50,890 tons
of emissions reduced annually

Top: The Energy Network Operations Center at NYEM, Albany. Bottom: President and Chief Executive Officer Gil C. Quiniones, right, explains data to a visitor.
A Long History. A Bright Future.

It’s more than a museum—it’s an experience. But the incandescent exhibit lighting at the New York State Museum was so old and inefficient, it could have been designated an historic artifact.

The museum is a center of art, science and history dedicated to exploring the human and natural history of the state. Founded in 1836, it is also the nation’s oldest and largest state museum. Now, the experience of tens of thousands of visitors, scientists and scholars that visit each year is brighter and more enjoyable thanks to a new LED lighting system made possible by NYPA.

All old, inefficient incandescent lighting equipment throughout the museum exhibit areas needed replacing. As part of the project, the museum upgraded to energy efficient lighting technology, which cost about $750,000 more than using incandescent.

Many of the project costs were going to be the same whether using conventional or energy efficient lighting. By making the energy efficient investment the museum spent more, yet the energy savings will help them achieve just a four-year payback for that choice for lighting that will last for many years. Approximately 2,000 fixtures of high-performance LED track lighting were installed, along with a control system that enables staff to light specific areas and pathways.

At the New York State Museum, the past intersects with the present to become one of the state’s must-see destinations. Now, with help from NYPA, the museum’s future is even brighter.

Left and opposite: The New York State Museum, Albany, where a NYPA-led energy efficiency project was completed in 2016.
Helping Schools Harness Sun Power

It’s warm and sunny. The sound of kids laughing, talking and playing ball can be heard from outside as students from Somers Middle School revel in spring fever. At the same time, the school is harnessing that same sunlight to generate electricity.

The excitement and enthusiasm for all things STEAM (Science, Technology, Engineering, Arts and Math) radiates everywhere at the school. So when the opportunity to participate in K-Solar presented itself, Somers Middle School was one of the first school districts to join. K-Solar, a joint program of NYPA and New York State Energy Research & Development, provides New York State school districts, at no cost and no obligation, with the tools and expertise to install solar energy at their facilities and reduce energy costs.

In 2016, Somers Middle School became the first school in the state to install a roof-mounted solar array as part of K-Solar. In addition, NYPA provides energy advisory services to schools before, during and after the installation of solar technology by qualified developers.

There’s even more to K-Solar. NYPA recognizes we have to start early to engage and train students for jobs in the energy industry. That is why one of the most valuable aspects of K-Solar is free teacher training and curriculum support offered to all schools that register with the program. It’s another example of how NYPA is leveraging our expertise and knowledge to continuously develop one of the state’s greatest resources—our children.

K-Solar brightens children’s lives and minds.
— Evan Kolkos, Manager, Customer Business Development

As diverse as the county in which it is located, Bronx Community College of The City University of New York (BCC) student population represents more than 100 countries. Many students are the first in their family to attend college. They know getting a good education is a choice that takes time and sacrifice.

NYPA is partnering with BCC to make choices so the school’s buildings operations are as conducive to learning as possible. A campus-wide utility upgrade will ensure its electric infrastructure is more efficient and more resilient during extreme weather events.

The project has three major components. They include installation of a centralized chiller plant, hot water system replacement and improvements to the reliability of electric service from the local utility. The latter is accomplished by combining several lines into a single high-tension service, which is also cost-effective.

BCC did not have a centralized chiller system before this project. A chiller uses water, air or other mediums to cool and dehumidify air in mid-size and large buildings. The existing chillers served only two buildings. Operation and maintenance of the old equipment was costly and inefficient.

In 2016, NYPA completed the installation of a new, centralized chiller plant that serves multiple campus cooling needs. The state-of-the-art chilled water system reduces energy consumption and maintenance costs, and with continuously recirculated water, bypasses extra city water and sewage services. Water-cooled chillers are less costly, longer lasting and environmentally friendly. The new chiller plant and other project components result in the elimination of 5,600 tons of greenhouse gas emissions annually.

By choosing to invest an additional $1.7 million for the more efficient chiller system, versus standard equipment, the energy savings will pay for this efficiency upgrade in less than a year.

The success of the BCC project reinforces that when we make sound choices for our lives and our environment, it’s all academic.

— Mike Doyle, Project Manager, Energy Efficiency

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Imagine it’s a time in the future. A college student is studying in their dorm. A storm is raging, power lines are down and everything is at crisis stage. Local families are seeking emergency shelter. It’s cold and dangerous outside but the campus has lights, heat, hot water and electricity. This is because it is powered by a microgrid, a small-scale power grid that can operate independently or in conjunction with the area’s main electric grid to provide electricity.

This scenario may sound unlikely today, but the future is coming due to projects like the partnership of NYPA and the State University of New York (SUNY) at New Paltz to construct nearly $1.4 million solar generation and battery storage system. The project will demonstrate the viability of storing renewable energy independent of the main grid, which can then be used in times of high electric demand on campus or during extreme weather events in the region.

While not sized to run the whole campus, SUNY New Paltz will use the microgrid to power a portion of its Etling Gymnasium when electric use is high, like the summer air-conditioning season.

The gym also serves as a regional American Red Cross emergency shelter for situations like the one described above. During emergencies, the microgrid’s primary use will be to provide hallway and bathroom lighting so people can use the facility without flashlights and with the added benefits of increased safety and security in those areas. Outlets will also be available for charging mobile devices essential for communications, especially for families.

With the versatility of using and storing renewable power, the microgrid can enhance SUNY New Paltz’s ability to better serve its students and the surrounding community with clean energy when it’s needed most.

Microgrid Basics
A microgrid is a small-scale, self-contained electric system that operates independently or with the central grid. It connects electric loads with locally produced, or battery-stored, clean power such as solar or wind.

Microgrids and smart inverters – here now! — Chuck Hermann, Senior Research & Technology Development Engineer I
Imagine being an electron on a virtual tour along transmission lines. Or maybe you’re an engineer, faced with discovering how to power a city with water. Perhaps you’re meant to be a geologist, called on to excavate rock to support a power project.

You can take on all of these roles and more at NYPA’s newly renovated Niagara Power Vista, an admission-free visitors center a few miles downstream from Niagara Falls. It’s part of our Niagara Power Project in Lewiston, and offers free educational fun for all ages. More than 7 million people have visited since the Power Vista debuted in 1963.

In 2016, NYPA unveiled the most extensive upgrades and reinvention in the Power Vista’s history. NYPA had many goals for the new Power Vista. It needed to continue to be a place for learning about energy, hydropower and power transmission. We also wanted to provide:

- The latest hands-on interactive technologies, large touch screens and internet connectivity
- More STEAM (Science, Technology, Engineering, Art and Math) exhibits to inspire future generations of energy workers
- Chip cards that allow visitors to record their experiences and download them onto a smart phone or computer, and share on social media

Project management staff at the Niagara project and our administrative offices in White Plains played a large role in bringing the new Power Vista to life. We worked closely with Hadley Exhibits Inc. of Buffalo, whose visitors center installations include the U.S. Capitol, multiple National Park Service sites and the National Museum of Immigration at Ellis Island.

Attendance has risen significantly since the Power Vista reopened in early June. The site hosted 75,585 people in 2016, with 67,785 of those visits taking place after the reopening. For all of 2015, the Power Vista saw 67,573 visitors.

NYPA took additional steps to bring people to the Power Vista last year. We helped fund the seasonal Discover Niagara Shuttle, a new, free service that stops at the Power Vista and more than a dozen other sites along a 14-mile route between downtown Niagara Falls and Old Fort Niagara in Youngstown. Shuttle service for 2017 will resume in May.

The successful reboot of the Power Vista will serve as a blueprint for future plans to refurbish NYPA’s other free visitors centers—at our Blenheim-Gilboa Pumped Storage Power project in the Catskills region and the St. Lawrence project in Northern New York.

Career Highlight Seeing the Smiling Faces.

— Lou Paonessa, Community Affairs Director

Challenges?

Sure, we had a few.

— Marek Kobialka, Construction Engineer II

Many worked together to exceed expectations.

— Gregory McNamara, Project Engineer

Opposite: Visitors enjoy new experiences at NYPA’s refurbished, admission-free visitors center, the Niagara Power Vista, Lewiston.
There are families and communities around some of NYPA’s power plants and transmission lines facing economic hardship. These are our neighbors and in 2016, NYPA reinvigorated its Environmental Justice (EJ) initiative to address their needs. The EJ team met with community leaders and neighborhood associations in the areas where NYPA owns and operates facilities to better understand the challenges they have. Together, we identified two ways in which NYPA can help improve the quality of life for families and residents: more access to high-quality STEM (science, technology, engineering and math) education in schools, and assistance with energy efficiency for low-income homeowners and renters.

Community leaders were unanimous in their desire to partner with NYPA to bring STEM education into their classrooms. NYPA developed a new initiative that will be launched in 2017 to provide teacher training and renewable energy curriculum development, at no cost, to educators in our EJ communities. In addition, last summer, NYPA sponsored a successful STEM camp at the Niagara Power Vista, the visitors center for the Niagara Power Project in Lewiston. We plan to expand the program to other parts of the state.

Sustainability. Acting Now, Protecting the Future.

Leaving the world a better place is one of the most important legacies we can provide for our children. It’s an essential sustainability goal. Sustainability is defined as a requirement of our generation to manage basic natural resources so that a healthy quality of life can potentially be shared by all future generations. Sustainability is more than a concept at NYPA. It can be achieved through conscious and informed action. NYPA places a premium on building a sustainable culture throughout our organization. Activities in 2016 prove we are walking the walk.

A new Sustainability policy was adopted to create a framework for incorporating sustainable practices in NYPA’s day-to-day operations and its future plans. To assist with measuring performance toward meeting sustainability goals, a digital dashboard was introduced that provides detailed analytics to inform decision making and shape policy. Employees can access the interactive dashboard to review sustainability performance at a glance and quickly assess the impacts of their projects. Collaboration has been the key to driving NYPA’s sustainability performance. Employees from diverse business groups worked with Sustainability staff to develop and implement projects to minimize our environmental footprint, lower costs, and improve efficiency. In 2016, engineers and energy efficiency experts at the Niagara project launched a demand flow optimization project that improves chiller efficiency, and an LED lighting and controls retrofit project that covers three buildings.

Making more sustainable choices in our personal lives was reflected in the increasing number of electric vehicles (EVs) purchased by employees. To support this trend, NYPA expanded its Workplace Charging Program in 2016 to our 500-MW Combined-Cycle Power Plant in Astoria, and added eight charging stations at our facilities for a total of 17. To further encourage adoption of EVs, and capitalize on employees’ growing enthusiasm, test-drive events were held at various sites where employees were able to take electric and plug-in hybrid vehicles for a spin.

Low-income homeowners and renters must stretch each dollar to make ends meet. One way NYPA can help is by providing residents with solutions that can lower electricity bills. Working with our community partners, NYPA is coordinating energy efficiency workshops for seniors and families, and developing plans to distribute low-cost energy efficient lighting and weatherization kits to EJ communities statewide.

EJ/Sustainability: Corporate responsibility in action.

— Lisa Wansley, Vice President, Environmental Justice & Sustainability

NYPA Environmental Justice, inspiring future engineers.

— Kaela Mainsah, Manager, Environmental Justice

EV Ride & Drives electrified employees.

— Lielle Berman, Project Coordinator, Sustainability

Cross-functional teams embraced projects supporting BuildSmart NY.

— Brandon Hardman, Project Analyst, Sustainability

Sustainability dashboard bringing data to life!

— Kerry-Jane King, Director, Sustainability
Conquering capital challenges. Triumph through teamwork.
— Roger Gural, Construction Inspector, Thermal Projects

Demonstrating data-driven decision making delivers.
— Fiona Spencer, Manager, Strategy Project Execution

Do it right the first time!
— Vincent Ammirato, Senior Quality Engineer, Quality Assurance & Code Compliance

Love working at B-G Visitors Center.
— Adrienne Gable, General Clerk, Community Relations

Moving power along NY’s Energy Highway.
— Kedaar Raman, Supervisor, Instrument & Control

Maximize the positive. Minimize the negative.
— Rommel Namit, Supervisor, Mechanical & Civil Structural Design

NYPA Security: Often imitated, never duplicated.
— George Vitti III, Security Sergeant

Environmental Justice enhancing STEM in communities.
— Ed Birdie, Director, Community Affairs

Diversity, unity, inclusion, strength, beauty, power.
— Lori Alesio, Assistant General Counsel

Published my NYPA history, feeling proud.
— Rock Brynner, Media Relations Specialist II

Adversity brings out best in people!
— Chris Caseland, Manager, Support Services

Smart G&T initiative nurtures at NYPA.
— Ben Ettlinger, Application Architect, Application Development & Support

My manager and coworkers are amazing!
— Rich Willette, Senior Analyst/Programmer, Application Portfolio

Working hard brings its own rewards.
— Gregory Riedel, Senior Electrical Designer II

Optimize fuel procurement, maximize net margin.
— Rita Desai, Manager, Fuel Contracts

Challenges were lessons learned on reflection.
— Ekaterina Quinones, Billing Representative II

Leveraging differences as a competitive strength.
— Nancy Harvey, Affirmative Action Officer

NYPA energy: Every day is electrified!
— Mary-Ellen Walsh, Senior Design Document Coordinator

Four new emergency diesel generators commissioned.
— Richard David, Electrical Engineer II

A re-energized NYPA, ready for 2017.
— Stephen Ramsey, Manager, Legislative Affairs

Communicating important work by amazing people.
— Alice Kenny, Director, Graphic Communications

Broadened my horizons powering NY’s neighbors.
— Mark Schwartzburt, Lead Power Contracts Analyst

Synergistic methodology between engineering, Mother Nature.
— Mike Jeckovich, Construction Engineer II, Hydro/Transmission

Stay energized, keep learning and innovate.
— Charles E. Campbell, Manager, Instructional Technology Solutions

Completed line patrol application (data splice).
— Ilya Yermolenko, Analyst, Asset Management

First TRV installed for breaker protection.
— Misak Krikorian, Senior Electrical Engineer II

A time of change and direction.
— Steven Gosset, Manager, Media Relations

Expanding family at work and home.
— Jill Anderson, Executive Vice President & Chief Commercial Officer

IT - welcome to the 21st century.
— Kenneth Shelley, Lead Systems Programmer, Infrastructure & Core Services Operations

A time of change and direction.
— Steven Gosset, Manager, Media Relations

Environmental Justice enhancing STEM in communities.
— Ed Birdie, Director, Community Affairs

5MW solar installed at NYC schools.
— Dennis Willette, Project Engineer, Energy Efficiency

I quit smoking and lost 30 pounds.
— Carol Jones, Warehouseperson, Niagara

NYPA: Best at communicating with employees.
— Kamran Khan, Project Engineer I

Opposite: A test of high-efficiency LED lighting on the Verrazano-Narrows Bridge, New York City.
You know you’re doing things right when 97 percent of your customers say they’re happy.

In this case, the customers are our employees who participated last year in NYPA’s Mentoring Program, which started in 2010 with 14 pairs of mentors and high-performing mentees. More than 325 people have participated, since inception including 56 in 2016. Mentor-and-mentee pairs meet regularly—typically twice a month. Quarterly meetings are held with all pairs, with mentees giving presentations on the career guidance they received. The mentee has primary responsibility for the relationship and driving conversations.

This program promotes greater opportunities for people on the way up and makes NYPA stronger. Mentees tap into the knowledge experienced employees offer. Mentors benefit by getting different perspectives, often from staff new to NYPA.

Participants can focus their time in several areas including: Understanding NYPA; Career Planning & Development, Demonstrating Diversity; Showing Leadership; Influencing Others & Managing Relationships; and Communicating Effectively.

The Mentoring Program also helps address the Knowledge Management initiative of our Strategic Vision 2020, which aims to establish an enterprisewide system to capture, organize, distribute and adopt NYPA intellectual assets.

Wisdom From Experience Powers Us Forward

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Top: From left, Keith Hayes, vice president, Economic Development; Ali Iravani, system planning engineer II; and Lori Gale, director, Civil/Structural Engineering. Bottom: From left, Andrew Stewart, market forecasting services analyst II; and Lorna Johnson, senior associate corporate secretary.
The challenge: Integrate a 200-year-old, recreational and historic treasure with the largest state electric utility in the nation, using 21st century information technology—in just eight months.

The solution: It took a village, and then some. Lots of teamwork, long days and a shared goal showed NYPA’s Information Technology (IT) team was more than up for the task.

Governor Cuomo announced in 2016 that the New York State Canal Corporation would become a subsidiary of NYPA on Jan. 1, 2017. The first order of business was the integration of the Canal Corp.’s dated information and communications systems that were spread statewide.

It was all hands on deck as IT managed, designed, procured and implemented the complicated project. NYPA software and hardware engineers alongside our cyber security and telecom experts coordinated with Canal Corp. staff to deliver a state-of-the-art system that seamlessly interfaces with NYPA’s information assets. And it happened on time and within budget.

Information is the Resolution of Uncertainty

From Claude Elwood Shannon—an American electrical engineer who is considered the father of Information Theory

We are all familiar with the MRI technology that provides doctors with a powerful tool to diagnose problems by using image pattern recognition to distinguish disorders and facilitate a diagnosis. Following this concept, NYPA is using technologies, to improve its power plant and transmission line reliability. We call it the Integrated Smart Operations Center (iSOC).

Our Utility Operations and IT teams launched the iSOC to improve asset management, health monitoring and operational reliability by fully digitizing our assets. iSOC creates “digital avatars” of NYPA’s 16 power plants and more than 1,400 circuit-miles of high-voltage transmission lines. A quantum leap toward this goal happened in 2016 when NYPA became one of the first utilities in the nation to use GE Power’s groundbreaking Predix software.

Predix generates advisories from the digital avatars using data from smart sensors on equipment to guide iSOC staff with pattern recognition insights for optimizing the operation of our power system assets. Predix supports a multitude of essential operating responsibilities, including predicting failures, scheduling maintenance, and even providing information for system operations and maintenance, and capital investments.

In 2017, iSOC will grow to become a data analytics center for gaining relevant information to improve our power plants, grid operations, customer side operations and coordination of emergency response efforts.

2016 Canals’ challenging, action-packed implementation.

— Agnes Nandini Kumar, Senior Human Resources Information System Specialist

iSOC: Where precision and accuracy meet.

— Philip Saglimbene, Senior Project Engineer I

Opposite: Staff from Information Technology and other departments celebrate on Jan. 1, 2017, the day when the state Canal Corporation became a NYPA subsidiary.

Above: The Integrated Smart Operations Center members: seated, left to right: Ken Lee, senior vice president and chief information officer; Ricardo DaSilva, vice president, Strategic Operations. Standing, left to right: James Padgett, associate project engineer; Philip Saglimbene, senior project engineer; Helen Yang, senior director, IT Business Transformation; Ben Ettlinger, IT applications architect; Paul Tartaglia, senior vice president, Technology and Innovation, Richard Gaines, director, iSOC.


— Heena Mehta, Portfolio Manager, SAP

Actionable information is our analytic resolution.

— Richard Gaines, Director, Integrated Smart Operations Center

Blink an eye, year gone by.

— Peter L. Poggi, Director, IT Governance and Policy
As we reflect on 2016, it’s clear the New York Power Authority has added another important chapter to its rich history. In addition to the many impressive infrastructure projects, economic development accomplishments and personal stories captured on these pages, 2016 was remarkable for another reason, as we celebrated NYPA’s 85th anniversary.

Today’s energy industry is unrecognizable from the one that existed when Gov. Franklin D. Roosevelt signed the Power Authority Act in 1931. NYPA has grown into the largest state electric utility in the nation. We are constantly moving forward using innovative strategies and technologies to meet our customers’ needs, and to stay ahead of rapid change in the energy industry.

My fellow trustees and I see this happening on many fronts. While NYPA continues to make significant capital investments to keep our large hydropower projects running reliably, we’re also promoting clean, alternative power sources that address Governor Cuomo’s calls for more electric vehicles and more renewable energy, such as solar and wind.

Following an efficient transition and operational integration to start 2017, NYPA is also examining ways to reinvent the New York State Canal Corporation. We believe the canal system, and its users and communities, will benefit from this effort.

NYPA’s newest ventures are heavily focused on a digital future, such as the Integrated Smart Operations Center we initiated in 2016 and will develop more fully in the coming years. Working with software provided by GE Power, we expect the center to drive $2 billion in savings over the next decade by making our generation and transmission network more efficient, reliable and cost effective.

Those many accomplishments have been achieved while we continue to build a solid fiscal foundation that allows us to maintain legacy assets and pursue projects that lead the way in public power.

**A Strong Financial Footing**

On the pages that follow are historical and forward-looking financial highlights. You’ll see that the rating agencies are taking note of NYPA’s prudent stewardship, which enables us to make the large-scale investments needed to maintain our assets. NYPA’s strong balance sheet also allows us to offer attractive financing opportunities when customers work with us on energy efficiency and other projects.

These are exciting times for NYPA. We look forward to even more notable stories that will unfold in 2017 and beyond as we continue to bring New Yorkers the best energy system possible.

Sincerely,

John R. Koelmel
Chairman
March 2017
Coming home from school with an "A" was the best feeling in the world. In 2016, NYPA’s Finance team felt that same pride when two of the three primary bond rating agencies, Moody’s Investors Service, Inc. and S&P Global Ratings, validated their confidence in our solid financial position by reaffirming their favorable bond ratings of Aa1 and AA, respectively. They are joined by Fitch, another top rating agency, which also rates NYPA at AA.

Our bond ratings are among the highest of all public power utilities in the nation and are in the second highest of all rating categories. The ratings enable NYPA to maintain lower borrowing cost capability and make investments critical to sustaining our massive infrastructure assets of 16 generating facilities and more than 1,400 circuit-miles of transmission lines.

The ratings also allow NYPA to offer favorable borrowing rates to customers implementing cutting-edge energy-saving and renewable technologies.

We’re Getting A’s

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Prudent financial management equals double hoorAay!
— Brian McElroy, Treasurer
2016 Financial Fundamentals

At right is a basic framework illustrating how NYPA makes money and the ways we use it to create and retain jobs, encourage capital investments, develop energy-saving projects, and produce low-cost, clean reliable power using some of the most advanced digital technology available.

NYPA periodically issues bonds to finance long-term investments such as major capital projects. Bonds are paid back, for the most part, through sales of our electricity and transmission services. Monies raised from the sale of the bonds help NYPA to undertake significant projects to benefit New York State.

One example is the multiyear $726 million modernization of our high-voltage transmission system, known as Transmission Life Extension and Modernization. NYPA’s transmission system serves as the backbone to the state’s power grid. As these transmission assets age, it is critical to update them to maintain reliable electricity flows throughout the state.


Secure Bottom Line.  Propelling Us Forward.

NYPA is the largest state electric utility in the nation. We do not receive taxpayer money or state credit.
Procurement Transformation Through People, Process, Technology.

— John Canale, Vice President, Strategic Supply Management

NYPA’s commitment to diverse suppliers – outstanding!

— Victoria Daniels, Senior Supplier Diversity Program Analyst

Ariba: Fostering collaboration and strategic sourcing.

— Jennifer Travis, Senior Procurement Specialist

Buying a house is complicated. It’s a huge purchase that requires house-hunting, mortgage shopping, price negotiating, contract signing and much more. It calls for attention to detail at every level. Apply that to the more than 13,800 contracts and purchases NYPA processes each year. While some purchases are simple, many are complex as electric utilities are capital intensive. Consider all that’s involved with replacing one power plant turbine. It costs millions, is made overseas, has at least a year’s lead time for delivery and that’s just the beginning.

NYPA is forging ahead as an energy industry leader with projects to strengthen generation and transmission assets; implement technology throughout operations; and assist customers with energy-saving expertise and equipment. With the need to operate more effectively to support these far-reaching objectives, NYPA is using a twofold strategy to transform the way we make purchases:

• Utilize, and develop, staff expertise in the markets where we make purchases to maximize the value of moneys spent
• Employ technology to simplify, shorten and standardize the buying process to lower costs, save time and increase competition by enabling more firms to compete for NYPA contract opportunities

To address the technology need, NYPA launched Ariba, a cloud-based platform and one of the most widely used procurement systems in the world. Managing contracts with Ariba improves controls, streamlines processes and allows for vendor performance analysis that ensures NYPA gets the best possible value for its money.

In pursuit of perfection: Process Excellence

In an industry where unprecedented change is a fact of life, Process Excellence (PEx) serves as NYPA’s compass to make sure our processes are streamlined and provide maximum value.

PEx is one of the six initiatives that form the foundation of NYPA’s Strategic Vision 2020. It was created to optimize performance in all aspects of our operation while establishing a culture of continuous improvement.

One of the essential tools of PEx is the Lean Six Sigma methodology which analyzes processes to eliminate wasteful steps and identify root causes of problems. The methodology then facilitates the development of standardized, cost-effective solutions.

Employing Lean Six Sigma principles, design and drafting teams from the Niagara and St. Lawrence projects developed a new process for marking changes to engineering drawings in the field. Engineering drawings are the documents of record for any building or structure. Once construction starts, challenges in the field may compel adjustments to the design.

NYPA employees learning/applying process improvement.

— Bruce Beckstead, Process Excellence Lead

Employees working in the field must note changes on the original drawings. Lack of standardized notation and color-coding meant delays in construction, heightened risk of error and an increased need for drafters to return to the field to verify changes.

The new process ensures everyone on the project is using the same drafting symbols, acronyms and colors to describe the deviations from the initial design. A checklist issued at the beginning and end of construction facilitates validation of the drawings for completeness and accuracy. The new process formalizes and documents what was has been learned during construction and captures the collective knowledge for the future.

By following a consistent and disciplined approach, PEx is helping achieve measurable efficiency improvements. Perfection may not be achievable but its pursuit brings value each day.

Inspirational, motivational and just outright fun.

— Chris Carey, Operations Superintendent

NYPAs commitment to diverse suppliers – outstanding!

NYPAs commitment to diverse suppliers – outstanding!

NYPA employees learning/applying process improvement.

NYPA employees learning/applying process improvement.
75% of electricity generated was hydropower

ST LAWRENCE-FRANKLIN D. ROOSEVELT POWER PROJECT
Type: Hydroelectric
Location: Massena, St. Lawrence County
Net Dependable Capacity: 823,500 kW
First Commercial Power: July 1958
2016 Net Generation: 7.09 billion kWh
Net Generation Through 2016: 394.77 billion kWh

NIAGARA POWER PROJECT
Type: Hydroelectric
Location: Lewiston, Niagara County
Net Dependable Capacity: 2,704,500 kW
First Commercial Power: January 1961
2016 Net Generation: 15.05 billion kWh
Net Generation Through 2016: 806.25 billion kWh

BLENHEIM-GILBOA PUMPED STORAGE POWER PROJECT
Type: Pumped Storage/Hydroelectric
Location: North Blenheim and Gilboa, Schoharie County
Net Dependable Capacity: 1,163,500 kW
First Commercial Power: July 1973
2016 Gross Generation: 0.38 billion kWh
Gross Generation Through 2016: 51.26 billion kWh

RICHARD M. FLYNN POWER PLANT
Type: Gas/Oil
Location: Holtsville, Suffolk County
Net Dependable Capacity: 650,400 kW
First Commercial Power: May 1994
2016 Net Generation: 1.17 billion kWh
Net Generation Through 2016: 66.07 billion kWh

FREDERICK R. CLARK ENERGY CENTER
Function: Coordinating NYPA system operations
Location: Marcy, Oneida County
Opened: June 1980

SMALL HYDRO FACILITIES
Located on reservoirs and waterways around the state, these facilities include the Ashokan Project, Gregory B. Jarvis Plant, Crescent Plant and Vischer Ferry Plant.

SMALL CLEAN POWER PLANTS
Type: Gas
Location: Ten plants at six City of New York sites and one in Brentwood, Suffolk County
Net Dependable Capacity: 457,700 kW
First Commercial Power: June 2001
2016 Net Generation: 0.42 billion kWh
Net Generation Through 2016: 22.0 billion kWh

500-MW COMBINED-CYCLE POWER PLANT
Type: Gas/Oil
Location: Astoria, Queens County
Net Dependable Capacity: 520,000 kW
First Commercial Power: December 2005
2016 Net Generation: 2.71 billion kWh
Net Generation Through 2016: 33.21 billion kWh

NYPA TRANSMISSION FACILITIES
1,456.2 circuit-miles of alternating current transmission lines.
Size Underground Overhead Total
765 kV 0.0 154.9 154.9
345 kV 44.7 883.2 927.9
230 kV 0.0 338.0 338.0
115 kV 1.2 34.2 35.4
Total 45.9 1,419.3 1,465.2

AFFILIATED FACILITIES
ASTORIA ENERGY II
Type: Gas/Oil
Location: Astoria, Queens County
Net Dependable Capacity: 650,400 kW
First Commercial Power: July 2011
2016 Net Generation: 2.90 billion kWh
Net Generation Through 2016: 17.26 billion kWh

Ferry Plant.

ST. LAWRENCE-FRANKLIN D. ROOSEVELT Power Project.
Massena.

The 2016 Year in Review was designed, written, photographed and produced by the New York Power Authority's Corporate Communications staff.

Background: Line live replacement, Baldwinsville.
Back cover: Transmission lines at the St. Lawrence-Franklin D. Roosevelt Power Project, Massena.

Printed on recycled paper.
You want me to go WHERE?
—Trish Hennessy, Staff Photographer