

# **New York Power Authority & Canal Corporation - Accomplishments 2018**

## **Building the Grid of Tomorrow**

The men and women of the New York Power Authority (NYPA), the largest state electric utility in the nation, made important strides in 2018 in our effort to become the first end-to-end digital utility in the U.S. Our substantial investment in new technology is helping us build the efficient, flexible, integrated grid envisioned in Gov. Andrew M. Cuomo's Reforming the Energy Vision (REV), the Energy Highway and Clean Energy Standard initiatives.

New York State's power generation and transmission systems must meet the needs of a 21<sup>st</sup> century, sustainable, energy-driven economy. NYPA is transforming the grid of yesterday to lead the state into the future. We are making it smarter, more digital and more resilient to ensure our operational reliability and performance for years to come.

### **The Digital Future is Now**

The attention garnered by the launch of our Integrated Smart Operations Center (iSOC) in late 2017 confirmed to the utility industry that NYPA's digital future was rapidly taking shape and is redefining how electricity is generated and transmitted. Those efforts were recognized by the American Public Power Association, which honored us with its 2018 Energy Innovator Award.

The iSOC is drawing widespread interest within the energy industry. Last year, we hosted tours of the facility—located at our administrative headquarters in White Plains—for the U.S. Department of Energy, the New York State Energy and Research Development Authority (NYSERDA) and many of our public power sister agencies from the U.S. and Canada. VIPs also came to marvel at the myriad of innovations unfolding, including Lt. Gov. Kathy Hochul, Norwegian General Counsel Harriet Berg, former U.S. Energy Secretary Ernest Moniz and the chief scientist of Israel, Ami Applebaum.

Those visitors also marveled at our burgeoning world-class research and development facility—the Advanced Grid Innovation Laboratory for Energy (AGILe). With support from the Electric Power Research Institute—which will manage AGILe under a long-term contract—the lab simulates the impacts of new technologies on system reliability, performance and resiliency before they are deployed on New York State's grid. AGILe enables researchers to more quickly model the system and identify any potential issues—especially as more renewable energy sources, like wind, solar, and energy storage, are brought online. AGILe will solidify NYPA and New York State as leaders in grid modernization and create models for other utilities across the country.

### **Defining the New Normal for Utility Operations**

#### **Continuous Protection System**

NYPA established a continuous protection system to monitor the health of transformers and protective relays at switchyards and substations so we can continue to deliver reliable power to our customers.

This technology continuously checks the operational health of protection systems, including instrument transformers that measure system voltage, current and protective relays. They are designed to open the high-voltage circuit breakers within fractions of a second when a problem in the circuit is detected. The goal is to protect workers, limit damage to equipment and prevent the problem from spreading to other areas of the transmission network.

NYPA first began deploying protective system monitoring at several of our small power plants in the City of New York.

It was also installed at our Blenheim-Gilboa Pumped Storage Power Project in the Catskills region last year and

NYPA is working to implement the system at the Frederick R. Clark Energy Center, near Utica. Implementation will conclude at the St. Lawrence-Franklin D. Roosevelt and Niagara power projects in the near future.

We also aggressively advanced our smart generation and transmission capabilities through an expansion of the Phasor Measurement Unit (PMU) program and upgrades to the Convertible Static Compensator (CSC). These initiatives collect data more efficiently and accurately, giving us better visibility of real-time asset performance.

The PMU deploys sensors to collect voltage and current data at generating facilities and switchyards with high-resolution and precise time stamping. The data can be combined and used for real-time grid management, asset management and potential problem detection. NYPA was one of the first utilities to invest in PMUs. The CSC can transfer about 200 megawatts (MW) from one transmission line upstate to another downstate by controlling voltage and power flows.

## **A New Generation of Power Generation and Transmission**

The digital innovations transforming NYPA are being deployed while keeping in mind that power generation and transmission remains the heart of NYPA's mission—and the core of our business. Thanks largely to NYPA's three large-scale hydroelectric plants, we generate a substantial portion of statewide power needs—up to 25 percent of electricity used in New York State on a given day. NYPA is pursuing several initiatives to ensure its supply of power to the state grid remains reliable and resilient:

### **Smart Path**

NYPA filed an application, known as an Article VII proceeding, with the New York State Department of Public Service for the planned rebuild of the Moses-to-Adirondack transmission lines in Northern New York.

Smart Path will use existing rights of way to rebuild 86 miles of transmission lines, including 78 miles constructed originally by the federal government in 1942 and acquired by the Power Authority in 1953. The lines deliver economical, clean and renewable energy to the state grid, including hydropower from the St. Lawrence-FDR Power Project and newly built renewable energy sources.

The rebuilt lines will be able to carry enough clean electricity to power 720,000 to 900,000 average-sized homes and provide a cost-effective way to add renewable power to the grid, especially power generated within New York State.

Construction is estimated to begin in 2020 and the lines are expected to be in service in three to four years.

### **Underwater Cables**

NYPA completed a \$68.7 million project to place underwater transmission cables across 1.7 miles of Lake Champlain. The cables, laid as deep as 195 feet below the surface, allow power flow to and from Vermont, and improve communications systems.

The new section of submarine cable is part of the 8-mile-long Plattsburgh to Vermont PV-20 transmission line jointly owned by NYPA and the Vermont Electric Power Company. The line provides a critical safety and resiliency feature for New York and Vermont that prevents the spread of blackouts in both states and permits greater access to renewable energy and expanded energy markets. It carries hydropower from the St. Lawrence-FDR Power Project, part of which flows to neighboring states under federal law.

### **Transmission**

We continue to pursue the bold goals of NYPA's \$726 million Transmission Life Extension and Modernization (TLEM) program, which started in 2012 and will continue to 2025. This initiative encompasses assets in Central,

Western and Northern New York and includes refurbishing transmission structures, and upgrading power plant switchyards and substations.

One TLEM initiative was the purchase of 35 high-voltage circuit breakers to control and protect circuits along NYPA's more than 1,400 circuit-miles of transmission lines. This work also involved installing surge arrestors, transformers, breakers and relays in substations.

### **AC Transmission**

NYPA, in partnership with North America Transmission, was recommended by a New York Independent System Operator committee to build a section of the AC Public Policy Transmission Project that will help relieve transmission congestion and enable more power to flow to the population centers downstate.

## **NYPA Power Projects: A Year of Milestones**

### **St. Lawrence-FDR Power Project**

New York was ahead of the curve in 1958 when it began generating clean, renewable hydropower by using the mighty flow of the St. Lawrence River to create electricity for the benefit of all New Yorkers. To celebrate this milestone, Governor Cuomo declared July 17, 2018 as St. Lawrence-Franklin D. Roosevelt Power Project 60th Anniversary Day.

A renewed partnership was announced between NYPA and Ontario Power Generation (OPG) for 15 more years of collaboration between St. Lawrence in Massena and the R.H. Saunders Generating Station in Cornwall, Ontario. This partnership ensures the long-term shared management of the Moses-Saunders Power Dam, which spans the St. Lawrence River between New York and Ontario. NYPA and OPG will continue to jointly manage the dam, including monitoring water flow, implementing maintenance practices, and sharing equipment and services.

It was a busy year for power generation at St. Lawrence, which had its second-best megawatt-hour production year, second only to 2017.

### **Blenheim-Gilboa Pumped Storage Power Project**

NYPA reached historic agreements with communities, and state and federal partner agencies to provide more than \$70 million in benefits over the next 50 years in support of the continued operation of our Blenheim-Gilboa Pumped Storage Power Project (B-G). The agreements consist of \$50 million to be shared between the towns of Blenheim and Gilboa, and \$20 million for environmental and recreational enhancements in Schoharie County.

The commitments are part of NYPA's relicensing application submitted to the Federal Energy Regulatory Commission (FERC) for B-G's continued operation through 2069. The agreements are contingent on FERC's issuance of that operating license; a decision is expected by May 2019.

The B-G staff works closely with the New York City Department of Environmental Protection (DEP), which owns the nearby Gilboa Dam. In 2018, NYPA entered into a 10-year agreement with DEP to operate and maintain two small hydroelectric projects in the Catskills.

### **Niagara Power Project**

The Niagara Power Project in Lewiston, producer of the largest amount of electricity in the state, in 2018 continued its pivotal role in the economic revival of Western New York.

NYPA trustees approved the 10-year extension of low-cost hydropower contracts, totaling 530 MW to 116 business operations in Western New York. The contracts are tied to capital investment commitments of more than \$136 million annually. Niagara hydropower is available for companies within a 30-mile radius of the Niagara

Power Project and ones located in Chautauqua County. The hydropower is linked to tens of thousands of existing jobs.

In addition, the Power Vista, the Niagara project's state-of-the-art visitors center, continued to encourage tourists to spend more time in the Niagara Falls region, recording 95,609 visits in 2018. USA Today named the Power Vista—whose free energy-themed interactive exhibits include a 4D theater—a “Top 10 in Niagara” destination last year.

### **NYPA-Funded Training Center Debuts**

In August, classes began at the Northland Workforce Training Center on Buffalo's East Side. The center, for which NYPA provided \$15 million in funding, focuses on high-skills training for careers in the clean-energy economy and advanced manufacturing sectors. This is especially important as the retirement of utility workers is expected to accelerate industry-wide in the next decade.

### **500-MW Plant Named in Honor of Eugene Zeltmann**

Our 500-MW Combined-Cycle Power Plant in Astoria has a new name: the Eugene W. Zeltmann Power Project. NYPA held an event in December that marked the project being named in honor of Zeltmann, who led NYPA from September 1997 to January 2006. He died in February 2018.

### **NYPA Will Provide Customer Energy Solutions to Help Seal the Green New Deal**

Achieving greater energy efficiency throughout New York State is another major priority for NYPA, as we help achieve Governor Cuomo's goals to reduce greenhouse gas emissions 40 percent by 2030 and make New York 100 percent carbon-neutral by 2040 as part of his Green New Deal. NYPA is leading the way with several important projects.

### **NY Energy Manager**

NYPA will maximize customer value from our NY Energy Manager, which monitors energy usage for more than 20,000 facilities, representing 1,400 organizations. NY Energy Manager now receives information from more than 25,000 meters resulting in 1.6 billion data points. We expect those numbers to grow rapidly in 2019. The data captured enables NYPA to evaluate how a building uses energy and provide cost-saving strategies that can make facilities more energy-efficient and realize dramatic reductions in greenhouse gas emissions.

### **Electric Vehicles**

We are taking significant steps to ensure electric vehicles (EV) become a far more popular choice for consumers. Our \$250 million EVolve NY program, introduced in 2018, is a key pillar of Governor Cuomo's Charge NY 2.0 initiative. We will look to accelerate the adoption of electric vehicles and bring the state closer to its goal of installing at least 10,000 charging stations by the end of 2021.

NYPA is well positioned to play a pivotal role in moving the electric transportation sector forward. We have the expertise to help reduce market risk and attract private investment. We issued a Request for Information to identify potential public and private partnerships that will help address key barriers to EV expansion. This will help gauge interest in collaborating on new business and ownership models for developing EV infrastructure and services. It will also help identify financial, technology and service innovations that will help remove EV marketplace barriers.

The first phase of EVolve NY commits \$40 million to address existing barriers and financing gaps that could impede development of DC fast chargers. It will also address potential obstacles such as a lack of consumer awareness and regulatory issues, including demand charges and the lack of incentives for installation of charging stations.

The key innovation is a high-voltage conductor that feeds multiple chargers and receives power directly from medium-voltage utility lines without using a step-down transformer. This significantly reduces the system footprint and installation costs compared to existing fast-charging solutions.

As part of Charge NY 2.0, the New York State Thruway Authority is partnering with NYPA to install fast-charging stations at Thruway service areas and Thruway-owned commuter parking lots over the next two years. These installations build on a trial program that brought fast chargers to four Mid-Hudson Valley service areas. Over the next several years, chargers will be installed at the remaining 23 service areas.

### **Smart Street Lighting NY**

Our Smart Street Lighting NY program calls for at least 500,000 streetlights statewide to be replaced with energy-saving LED technology by 2025. The program has the potential to reduce energy consumption in New York by 482 gigawatt hours annually—the equivalent of nearly 45,000 households—saving taxpayers \$87 million a year, drastically reducing greenhouse gas emissions and improving the quality of light and safety of communities.

For example, NYPA completed the installation of LED streetlights in the Town of Southampton. The project will save local taxpayers nearly \$269,000 in annual energy and maintenance costs while also reducing greenhouse gas emissions about 550 tons a year—the equivalent of taking more than 100 cars off the road.

In advance of the 2018 Great New York State Fair, NYPA led a project in which \$866,000 in energy efficient LED upgrades were installed in six buildings on the fairgrounds in Geddes, providing better lighting clarity and safety for visitors while reducing greenhouse gas emissions and saving taxpayer dollars.

NYPA, in partnership with the State University of New York (SUNY), also completed the installation of LED lighting at Purchase College in Westchester County. The upgrades will reduce greenhouse gas emissions by 727 tons a year and save taxpayers more than \$161,000 annually.

NYPA has more than 100,000 LED streetlight fixture replacements in its energy services pipeline with our governmental customers.

### **Energy Storage**

A new initiative was announced in December to spend \$250 million over five years to accelerate flexibility to the electric grid—primarily through energy storage—so New York State can take advantage of more zero-emission resources such as wind and solar power. NYPA's multi-pronged investment effort will address key barriers, accelerate implementation of 150 MW of grid flexibility and de-risk the market while playing an essential role in achieving the state's clean energy goals and maintaining affordable energy for all New Yorkers.

SUNY and NYPA announced plans for a solar and energy storage system that will provide clean, local power to SUNY Delhi and the nearby community. The initiative sets a target of deploying 1,500 MW of energy storage by 2025.

NYPA also revealed it will establish a first-of-its-kind 20 MW lithium-ion battery project in Northern New York to demonstrate the operation of a large-scale energy storage system. The North Country Energy Storage Project will advance energy storage development efforts and position us to lead storage adoption across the state.

NYPA will also install a behind-the-meter energy storage system using lithium-ion technology at our White Plains administrative offices. The \$2 million demonstration project, which is designed to operate during times of peak demand reduction, is being paid for by the battery manufacturer, Cadenza Innovation and a NYSERDA grant.

### **Metering**

NYPA is supporting a turnkey metering project for the Port Authority of New York and New Jersey at La Guardia and John F Kennedy international airports in which electric and water meters are being installed. Once completed, the system will assist with remote metering and data transmission to analyze usage and produce “on demand” energy reports and energy reconciliation and billing reports.

### **Solar Energy**

Advancing the governor’s aggressive effort to make renewable energy an affordable and accessible option, NYPA installed its largest-to-date solar array at Hudson Junior/Senior High School in Hudson, Columbia County. The 1,216-kilowatt ground-mounted system incorporates a new power source into the district’s infrastructure. It is expected to save the school approximately \$66,851 in energy costs annually and offset more than 952.5 tons of carbon dioxide, the equivalent of taking 204 cars off the road.

We also completed a cutting-edge solar energy and battery storage project at SUNY New Paltz in Ulster County. The system provides continuous solar photovoltaic power generation and supports the college’s efforts to sustainably offset its grid reliance.

### **NYPA Powers Economic Development Throughout New York**

Through 2018, our economic development programs secured 207,297 jobs and \$5.8 billion in capital investment commitments through the extension and allocation of 784.5 MW of our hydropower. Among the highlights:

- Extending Western New York hydro contracts for 10 more years, securing more than \$1 billion in revenues while keeping the state’s most impactful commercial and industrial businesses in the region
- Extending our original ReCharge NY contracts (signed on in 2012 when the program launched) for an additional seven years, securing more than \$500 million in revenues while making a positive contribution to the state’s economy
- Securing new long-term agreements with two of our key New York City governmental customers--the Metropolitan Transportation Authority and the Office of General Services. These agreements allow for alternative supply resources and guarantee fixed cost recovery on our dedicated assets
- Advancing our economic development strategy in the North Country with nearly 9,000 jobs retained, 700 created and \$520 million in capital investment commitments
- Extending Master Cost Recovery Agreements with some of our large governmental customers, paving the way for us to grow our energy efficiency programs, products and services

### **Raising the Bar for Environmental Justice & Sustainability**

Our Environmental Justice program took a major step forward with its landmark five-year Sustainability program. It also hosted after school and STEM programs for more than 2,000 children. NYPA delivered 260 new, energy-efficient refrigerators to Massena Housing Authority residents through a program that aims to strengthen an underserved community and promote a sustainable clean-energy future. The measures are in direct synergy with Governor Cuomo’s agenda to combat climate change and his REV strategy to reduce greenhouse gas emissions 40 percent by 2030, based on 1990 levels.

### **NYPA’S Financial Health as Strong as Ever**

NYPA’s financial health and the regard in which we are held by institutional investors is a model other public utilities seek to emulate.

## **Financial Ratings**

Maintaining a strong relationship with the capital markets is critical to how we operate. Fitch Ratings affirmed its strong credit rating on NYPA's electric revenue bonds, which is among the highest given to public electric utilities. Fitch affirmed an AA rating for more than \$800 million of NYPA long-term bonds and notes, and an F1+ rating for NYPA's commercial paper program.

This affirmation allows us to continue to offer low-cost financing to qualified customers to help fund some of New York State's most impactful energy initiatives. NYPA's strong credit is a continuing testament to the prudent fiscal and risk management of our business and balance sheet.

## **Risk**

Financial Risk management developed better governance in 2018 around the commodities portfolio that drives our biggest financial risks. We implemented two systems, Allegro (for trade capture) and Ascend (for risk analytics) last year, and gross margin targets were developed with uncertainty bands. Additionally, a business resiliency framework was developed and implemented. For the first time in eight years, all business continuity plans were thoroughly reworked using a state-of-the-art business impact analysis.

A competitive analysis was also completed to develop a perspective on NYPA's cost structure. Insights gained from this action will help NYPA be more competitive. NYPA also initiated an Owner-Controlled Insurance Program to significantly lower insurance premiums, and ensure consistency in insurance coverages and encourage small businesses to participate in contracts.

## **Merchant Generation**

The Energy Resource and Management division supported NYPA's strong financial position by optimizing its merchant generation assets; bringing in more than \$375 million of gross margin and successfully managed fuel availability through heat waves and cold spells. As a result, NYPA saved \$10 million through renegotiated contracts.

## **NYPA and Canal Corp. Employees: Our Most Important Assets**

This past year saw some notable accomplishments in labor relations and recognition of our workplace culture.

### **Labor Contracts**

NYPA ratified a three-year contract extension with the International Brotherhood of Electrical Workers (IBEW). The union represents more than 550 NYPA employees. In addition, 10-year contracts with the Civil Service Employees Association (CSEA) and the Public Employees Federation (PEF), which represent some employees of our subsidiary, the New York State Canal Corporation, were ratified.

The IBEW contract includes 2 percent wage increases annually from 2019 to 2022. Major provisions also include changes to the medical plan that better align with industry standards and maintain cost-sharing formulas achieved in the last contract. It also includes a new provision to digitize negotiated documents for easier access.

The IBEW and NYPA also received Department of Labor certification for our Electrical, Mechanical Operations and Transmission Line Apprenticeship programs.

Negotiations for successor agreements with the CSEA and PEF started under the New York State Thruway Authority—which previously oversaw the Canal Corporation—and continued when NYPA took ownership in January 2017. The agreements with both unions contained across-the-board wage hikes, increases in employee

contributions to health insurance and several work rule changes. The contracts cover employees at all Canal facilities.

### **Forbes Calls NYPA One of America's Best Mid-Size Employers**

NYPA was named to Forbes magazine's 2018 list of America's Best Mid-Size Employers, ranking sixth in the utility industry on the list of companies "liked best" by employees.

The ranking confirmed what all of us at NYPA already knew—that America's largest state power organization is a great place to work. Our programs and policies are among the most progressive in the industry and we take pride in consistently providing opportunities for challenge, inclusion, diversity, education and advancement.

Forbes cited NYPA President and CEO Gil C. Quiniones for "designing the next generation utility. Nothing this far-reaching has ever been attempted in the energy sector."

### **Office of Civil Rights & Inclusion**

The Office of Civil Rights & Inclusion (CRI) had a robust 2018, with significant achievements that included the establishment of a leadership summit for senior management. It also oversaw significant growth of NYPA's employee resource groups, which offer a wide variety of programs and events for employees.

CRI also took new steps to inform employees about its efforts to create and maintain an inclusive workforce. It developed an employee brochure about CRI's role at NYPA and held events to help employees network and grow professionally.

### **Safety**

During 2018, NYPA's Safety team initiated a review and revision of our Arc Flash Safety Program. This involved management and employees from every site providing input to identify inconsistencies, non-conformances and best practices. These groups were considered the "Arc Flash Champions" for their site. More than 200 employees participated in the 13 training/review sessions conducted by utility electrical safety experts.

### **NYPA's Helping Hand in the Rebuilding of Puerto Rico**

One of the proudest chapters of NYPA's history is the extraordinary work we have been doing to re-electrify Puerto Rico, and rebuild and harden its grid. Soon after the devastation left by Hurricane Maria in September 2017 became apparent, NYPA employees were deployed to Puerto Rico to restore electric service. The effort continued in 2018.

We began by working closely with the Puerto Rico Electric Power Authority (PREPA) to assess the damage that knocked out virtually all of the island's power plants and its 360 substations. We also coordinated New York State's utility mutual assistance process. The contingent turned on lights for communities and neighborhoods across the San Juan metropolitan area, which accounts for 70 percent of Puerto Rico's electricity consumption.

Under the direction of Governor Cuomo, NYPA signed a Memorandum of Understanding with PREPA in 2018 to help Puerto Rico organize and maximize efficiencies in its utility operations, and build a strong and resilient electric grid.

More recently, our engineers and technical experts undertook a root-cause analysis in April of the island-wide blackout, followed by a detailed report with analysis of critical action items, several of which were implemented by PREPA.

NYPA and PREPA are coordinating development of accurate facility ratings for the entire transmission system to ensure improved system planning capabilities, which will increase the resiliency and reliability of the island's generation and transmission assets.

NYPA is also coordinating with the Smart Electric Power Alliance—a nonprofit that helps energy firms address problems related to smart energy growth and usage--on preliminary steps to integrate a community solar program into PREPA's generation portfolio and advance the goals of a clean and modern energy future.

### **A Year of Reimagining and Celebration on the Canals**

NYPA's stewardship of the New York State Canal System continued in 2018. A major highlight was a \$2 million award from NYPA and the Canal Corporation to the winners of the Reimagine the Canals competition, which sought the best ideas to turn the canals into an engine for economic development, and serve as recreation and tourism hubs.

A proposal led by the Madison County Planning Department to build pocket neighborhoods along the canals received \$1.5 million, while the Erie Armada, a multiday boat race and festival that would also celebrate New York's booming craft beer industry, received \$500,000. The winners were among 145 entries from nine states and seven countries.

The Canal system, formerly known as the Barge Canal, marked its centennial in 2018. The 524-mile system includes the Erie, Champlain, Cayuga-Seneca and Oswego canals. The Barge Canal was built between 1905 and 1918 to accommodate larger boats and enable the waterways to better compete with railroads for freight traffic.

The signature event on the canals in 2018 was the four-month, 30-stop tour of the GlassBarge, from the Corning Museum of Glass. The barge, built with support from Canalway Development Fund grants, marked the 150th anniversary of the Brooklyn Flint Glass Company's relocation of its operations to Corning, mostly on the Erie Canal and the former Chemung Canal. The GlassBarge attracted capacity crowds at each stop to watch glassmaking demonstrations from a mobile studio created for the tour.

Construction began in May on a 2.1-mile section of the Erie Canalway Trail in Niagara County that, when completed in 2019, will provide a 135-mile stretch of uninterrupted trail. The project is a major component of Governor Cuomo's

Empire State Trail initiative, a 750-mile network set to be completed in 2020 that will stretch from New York City to the Canadian border and from Albany to Buffalo.

The Canal Corporation waived tolls for recreational vessels for the second straight year and saw a 3.4 percent increase in traffic during the navigation season, which ran from May 15 to Oct. 10. The Canal Board of Directors voted in December to continue the toll waiver through 2021. There was also a 20 percent increase in hire boat traffic in 2018, as more visitors discovered the pleasures of piloting a house boat along the Erie Canal.

### **More in Store for 2019**

After all we accomplished in 2018, NYPA is well positioned to embrace the many challenges that lie ahead. We have recognized the myriad changes in our industry. On top of that is our appreciation for the value of data, both as a source of knowledge and efficiency and as an economic asset that can inspire, with the collaboration of parties from all sectors. This is why NYPA has become a recognized industry leader.

Today we can achieve the level of ever-increasing innovation that was not possible even five years ago. Imagine, then, what the next five years can bring. We can't wait.