

Accomplishments 2019

Continuing to Lead by Example

The New York Power Authority (NYPA) operates in a much different world than even five years ago, as change is accelerating at a seemingly unimaginable pace. Today, electric utilities do more than provide electricity from traditional sources of energy. Generating facilities are being supplemented or supplanted by distributed power and microgrids. Renewables such as wind and solar are scaling to meet demand. Transmission infrastructure is becoming more accessible and resilient, and the challenge of energy storage, by necessity, is being addressed. The analog world for operating power plants is in the midst of its last chapter as our industry pursues the countless benefits of digitalization.

NYPA is stretching its talents and knowledge to take on “moon shots.” A “moon shot” is a major initiative defined as a way to tackle a difficult problem, come up with an ambitious yet achievable solution and use the latest technology to implement a new, often groundbreaking idea. Our initial “moon shots” are advancing exponentially the use of electric vehicles and accelerating the flexibility of the power grid to give New Yorkers great access to renewable energy. Both will have significant impact on economic growth and improving the environment for future generations.

In 2019, these ideas and others throughout this publication illustrate many important ways NYPA was thinking big and leading by example.

Putting Customer Success First

Being customer-centric is core to our public power mission. Our customers are asking for an increasingly diverse array of energy solutions that allow them to save money, operate more efficiently and be greener. NYPA is doing all it can to provide those solutions.

This bold thinking is framed by the initiatives of our Strategic Vision 2020. Our long-term plan is shaped by the new reality that NYPA is more than a utility that generates up to 25 percent of the state’s power at any given moment. NYPA has also become a full-fledged energy services organization providing our customers with energy efficient, cost-effective and environmentally sound solutions. By doing all this, NYPA is helping to

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fulfill Gov. Andrew M. Cuomo's mandate to make the state's electric system carbon-free by 2040.

The Strategic Vision 2020 has been our internal roadmap. Here are some of the places it has taken us:

Utility Operations

Becoming Asset Savvy

At its core, asset management is a critically important process that enables NYPA to determine how to best develop, operate, upgrade and dispose of assets. It takes costs, risks and asset performance into account. The more effective an asset management plan is, the more effectively assets can be maximized throughout their lifecycle.

Ensuring NYPA's approach to asset management was on the right path took the dedicated and sustained efforts of employees in virtually every department. Their hard work was rewarded when NYPA became the first electric utility in North America to achieve a coveted certification for asset management from the International Organization for Standardization. This globally recognized third-party certification, known as ISO 55001, is considered the international gold standard for asset management practices.

ISO 55001 is difficult to achieve, but it was worth the effort, as it reinforces a culture that had already become an integral part of NYPA's DNA in the operation of our 16 generating facilities and hundreds of miles of transmission lines. Its impact, moreover, has a profound effect on our entire organization. As Chairman John R. Koelmel noted, "It is a commitment to continuous improvement to deliver low-cost, clean reliable power and innovative energy infrastructure and services to customers."

Next Generation Niagara

NYPA's asset management savvy will be on display at the Niagara Power Project in Lewiston, after our Board of Trustees approved a 15-year, \$1.1 billion project to modernize and digitize this facility, which generates the largest amount of electricity in the state. Known as Next Generation Niagara, it represents the largest infrastructure investment by NYPA. It will ensure the continued reliable operation of a facility that on some days supplies up to 10 percent of the state's electricity.

Next Generation Niagara will have four phases to move NYPA toward becoming the nation's first end-to-end digital utility:

- Refurbishing a 630-ton crane that enables mechanical work.
- Upgrading and digitizing control systems.

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- Inspection of the penstocks at the Robert Moses Niagara Power Plant.
- Building a backup control room and replacing mechanical parts that have reached the end of their operating life.

Northern New York Upgrades

NYPA assets in Northern New York are also getting an upgrade. In 2019, NYPA announced the Plattsburgh, Willis and Saranac substations will receive \$34.3 million in improvements as part of a system-wide \$726 million Transmission Life and Extension Modernization program. The substations support operations at the St. Lawrence-Franklin D. Roosevelt Power Project in Massena.

Our substations and switchyards are often the unsung heroes of our transmission system. They have lines ranging from 111 kilovolts (kV) to 765 kV—the only such lines in the state. Given that NYPA owns about one-third of the state’s high-voltage transmission lines, ensuring the substations are operating at their best is crucial to ensure the energy system is reliable and resilient.

Managing Risk in Operations

By necessity, managing risk is a top priority at NYPA. To accomplish that, NYPA deployed several new tools in 2019 to complement existing operations, security and comprehensive safety measures.

- **Cybersecurity.** The march of would-be hackers trying to penetrate our grid is unrelenting. But so is NYPA’s commitment to cybersecurity. In 2019, NYPA trustees approved a cloud storage program to bolster data center infrastructure as part of a larger effort to modernize enterprise computer storage systems. Ultimately, these steps will enhance monitoring and security for all NYPA operational systems.
- **GridEx V.** When it comes to security, NYPA is always improving. That’s why NYPA took part in a GridEx V, the fifth in a series of biennial exercises run by the North American Electric Reliability Corporation to simulate physical and cyberattacks by unknown adversaries against North American energy infrastructure. It was a great opportunity for NYPA business units to learn how to coordinate with one another and build on relationships with external partners.
- **Analytics.** NYPA deployed state-of-the-art 3D modeling software at its Gregory B. Jarvis Plant, a hydroelectric facility in the Mohawk Valley. The software helps predict where water will flow and better allow engineers to predict how the neighboring Hinckley Dam will perform. Hinckley supplies water to the city of Utica and is popular for fishing and boating.

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- **Solar Forecasting.** NYPA has initiated a project to improve grid reliability and reduce operating costs by predicting solar energy generation. Using images from advanced weather modeling and digital cameras along with other data, forecasts are based in part on pictures of the sky that are analyzed to track cloud movement to help with load forecasting.

The Digital Utility Continues to Emerge

NYPA opened the Integrated Smart Operations Center (iSOC) in 2017. It conveyed NYPA was on track toward becoming the nation's first end-to-end digital utility. NYPA moved closer to that goal in 2019 with a \$93 million project to install digital communication systems on transmission lines.

The project is part of NYPA's Communications Backbone initiative, which is replacing circuits with fiber optic infrastructure. That will increase available bandwidth to accommodate digital assets, including more than 115,000 sensors to be monitored at the iSOC, so NYPA can respond to changing conditions and emergencies.

NYPA also reached beyond its borders to improve our infrastructure and bolster the state's renewable energy portfolio. NYPA signed a memorandum of understanding with the Electricity Supply Board, an Irish utility, and EirGrid Group, a grid operator owned by Ireland. They will work with NYPA to create and test new solutions to build a more reliable, efficient grid and integrate distributed power onto local and regional grids.

This work, done in conjunction with the Electric Power Research Institute, will be located at our Advanced Grid Innovation Laboratory for Energy in White Plains, which can perform a range of transmission and distribution grid simulations.

Safety First and Foremost

Every NYPA employee knows safety is our top priority. Shortcuts have no place here. That message was reinforced in October, when NYPA hosted guest speaker Brandon Schroeder, a veteran electrician, who spoke about how he cut corners while working on an energized electric panel. A resulting arc flash was nearly fatal. "It was all because I didn't believe in safety," Schroeder said. NYPA does. Training is encouraged throughout NYPA and includes digital courses on safety practices taken by every employee each year. Whether you work in the field or at a desk, the culture of safety is everywhere at NYPA.

The Wind on the Water

In a state with 19.5 million people, transformative energy projects must be big. The 1,700 MW to be generated from two offshore wind projects announced by Governor Cuomo in July will create enough power for more than 1 million homes. NYPA will

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provide transmission support for one project, the 880 MW Sunrise Wind development, which is expected to begin service on Long Island in 2024

NYPA also learned more about the potential of wind power from Offshore Wind—A European Perspective, a study commissioned by NYPA and other energy stakeholders. It examined the offshore wind experience in four European nations, where wind has been a key energy source for two decades. Among the takeaways:

- Planning for scale and encouraging healthy competition has been key to growth.
- Transparent, long-term grid planning—on land and offshore—removes barriers to entry and lowers costs.
- Long-term grid planning facilitates incentives to encourage projects to be finished in a timely manner.

NYPA in the Community and Beyond

NYPA has long been an active part of the communities near the locations where our facilities operate. NYPA has a stake in ensuring they thrive.

As part of the relicensing of the Blenheim-Gilboa Pumped Storage Power Project in the Catskills region, NYPA provided an initial payment of \$1.2 million to Schoharie County and the towns of Blenheim and Gilboa. NYPA will make annual payments to the county and towns over the 50-year license term, which will help them provide services and improve infrastructure.

An Increased Commitment to Environmental Justice

NYPA's Environmental Justice Program is casting a wider net and working closely with underserved communities across New York. As part of a five-year plan, the program is making a substantial effort to expand its geographical reach and impact. These efforts include more opportunities to provide STEM education, energy literacy and home weatherization workshops. As a result, NYPA ensures that energy programs—providing the benefits of a clean-energy economy—will assist a much wider group of people and communities.

Sustainability Core to Our Values

NYPA released its new Sustainability Plan 2019-2023. It defines how NYPA will meet the needs of the present while passing on a cleaner world to future generations. The plan provides a blueprint for how to integrate sustainability throughout NYPA and in our customer-facing programs. Among its goals:

- Establish strategies to reduce greenhouse gas emissions and the impact of climate change throughout NYPA's value chain.
- Reduce energy use and improve resource efficiency throughout NYPA.
- Protect and conserve water and land resources across NYPA operations.

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- Lead by example and accelerate adoption of sustainable technologies by showcasing NYPA's efforts.

Leading the Way Back in Puerto Rico and USVI

Hurricanes severely damaged the power grids in Puerto Rico and the U.S. Virgin Islands in 2017. When Governor Cuomo led the first rescue mission to Puerto Rico, NYPA President and CEO Gil C. Quiniones was with him. NYPA has been there ever since.

In 2019, NYPA continued work with the Puerto Rican government and the island's government-owned utility—the Puerto Rico Electric Power Authority—to rebuild the grid, provide technical assistance, consult on how to reform management and operations, and improve emergency preparedness.

NYPA also sent a team to provide technical support to the Virgin Islands Water and Power Authority, which sought NYPA's help as the islands of St. Thomas and St. Croix continued to experience power outages.

Financial Know-How

NYPA continues to maintain our high credit ratings, which gives us access to capital markets at attractive interest rates. As Moody's noted last March, NYPA's Aa1 rating is driven by "prudent financial management policies that have consistently resulted in financial metrics that are among the strongest of all U.S. public power electric utilities with generation ownership in our rated universe."

The other major rating agencies, Standard & Poor's and Fitch Ratings, have also affirmed high ratings for NYPA.

Economic Development

NYPA powers economic growth in New York by providing customers with low-cost, clean, reliable energy and the innovative energy infrastructure and services they value. The less they spend on energy, the more they can allocate to increase jobs.

ReCharge NY

One of the most tangible examples of how that equation plays out is through the ReCharge NY program established by Governor Cuomo in 2011. In return for power allocations at lower rates, businesses commit to retain or create jobs and commit to new capital investment. In 2019, ReCharge NY was tied to supporting 16,650 jobs and \$627 million in new capital investment commitments.

Alcoa

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Low-cost power from NYPA was the linchpin for a new seven-year agreement that preserved 450 jobs at the Alcoa aluminum smelting plant in Massena. The contract provides Alcoa—the largest North Country private employer—with 240 MW of power from the St. Lawrence-FDR Power Project. Alcoa has been a NYPA customer since 1955.

Energy Efficiency and Renewable Power

Customizing the Customer Experience

So much of what NYPA has done in recent years has been guided by what our customers want and need. They rely on us for low-cost power but also want our help in using electricity more efficiently and to provide guidance on how to lower their energy costs and reduce their carbon footprint.

In 2019, NYPA increased its budget for energy efficiency projects by \$1.5 billion, a number driven by customer demand, on top of more than \$3 billion committed to such projects since 1998. Our strong financial position enables NYPA to finance upfront costs of energy efficiency projects and provide customers with attractive terms for repayment.

This makes the work of our Clean Energy Solutions team more important than ever. They provide customers access to world-class expertise and a suite of services particular to their needs including digital energy management services, financing energy-saving equipment or implementing demand response capabilities.

Colleges Cut Costs with Energy Savings

Among NYPA's biggest customers are the sprawling networks of the State University of New York and City University of New York. They have hundreds of buildings ripe for energy efficiency improvements. This relationship became the inspiration for our joint project with SUNY, the State University of New York Clean Energy Roadmap.

Additionally, NYPA financed one of the largest such projects in 2019, a \$79 million package of improvements at Stony Brook University, which will save \$6 million in annual energy costs.

At CUNY, NYPA is partnering on \$26 million in energy efficiency improvements at City College to trim electricity consumption by 15 percent. Air-handling units at one major campus facility will be modified to achieve optimal temperatures depending on the season, while maximizing energy savings and reducing maintenance costs.

Empire State Plaza Upgrades

NYPA also works closely on energy efficiency with our sister state agencies, including the Office of General Services, which oversees the Empire State Plaza in Albany. In September, NYPA announced the development of a remote solar array in Oneida County capable of providing half of the plaza's power needs.

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NYPA will also oversee a \$50 million project to replace emergency generators with more energy efficient and quieter models. It will also include a \$30 million upgrade to a steam-driven chiller that will reduce gas use and emissions by 18 percent and \$16 million to install LED lights throughout Empire State Plaza.

Getting Bright About Lights

As the lead agency for Governor Cuomo's Smart Street Lighting NY, NYPA is helping the city of Albany with a \$20 million project to install 10,800 LED streetlights, whose bulbs will be more reliable and last longer. They trim energy costs in the state capital by \$3.3 million a year and cut greenhouse gas emissions by the equivalent of taking about 600 cars off the road.

It was part of a busy year for Smart Street Lighting NY. NYPA worked with three other upstate communities—Canandaigua, Cortland and Newark—to help them buy their streetlights from local utilities. What makes this program smart is its ability to let customers choose from options that enable streetlights to be deployed for such uses as Wi-Fi, weather sensors and energy meters.

NYPA also partnered with the Port Authority to install LEDs to brighten Jamaica Station in Queens, the busiest station outside Manhattan's Penn Station for the Long Island Railroad, the nation's busiest commuter rail line.

Scaling Solar

As costs for installation and materials drop, the case for solar power becomes more compelling for NYPA customers.

NYPA is working with Westchester County to develop both solar photovoltaic and energy storage systems at seven county-owned properties, including bus garages, the county courthouse and Hilltop Hanover Farm—a farm and environmental education center.

Solar and storage projects are also being built at the Jacob K. Javits Convention Center in Manhattan, where NYPA is overseeing the construction of nearly 4,000 solar panels that will generate up to 1.4 MW, to go with 2 MW of battery storage. This will allow for excess power to be stored for use during peak demand hours.

NYPA is well positioned to help customers implement renewables by serving as project manager for solar projects and also by providing a range of complementary energy services. That happened at Mohonasen High School in Rotterdam, where NYPA installed a 1.5 MW solar project and provided site surveys, solar energy analyses and technical support.

The Challenge and Promise of Storage

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Solar and wind are considered intermittent power—an energy source that is not always available. To rely on those clean energy sources more, we need energy storage.

Mastering energy storage has become a major focus for NYPA. In 2019, NYPA moved forward with a 20-megawatt (MW) demonstration project next to an existing substation in the North Country, home to several wind farms that use NYPA transmission lines. The \$29.8 million project features a one-hour lithium-ion battery system to absorb excess energy.

Storage also enables NYPA to keep power in reserve for times when transmission constraints prevent us from sending electricity to where it is needed. The project will further a state target to have 3,000 MW of storage by 2030, enough power for about 300,000 average-sized homes.

Interest in Electric Vehicles Is Electric

NYPA worked with the New York State Energy Research and Development Authority to install 70 electric vehicle (EV) charging stations at ReCharge NY customer locations, including 24 at Northwell Health, the state's largest private employers. This effort is in addition to the \$250 million commitment in 2018 to our EVolve NY program, which will invest in EV infrastructure and consumer awareness to encourage use of EVs.

NYPA designated the Village of Fairport, whose utility is one of our municipal customers, as its first EVolve NY Electric Vehicle Accelerator Community. The program aims to integrate EVs into Fairport's infrastructure, community and culture. A combination of home charging stations, public charging stations and a fast charger will be installed. This program complements \$3 million in funding to provide zero-interest loans so rural electric cooperatives and municipal systems, like the one in Fairport, can buy EVs.

At JFK Airport, the planes may not be electric, but a fleet of 118 baggage tugs and belt loaders at Terminal 5 soon will be. That will cut fuel usage by 200,000 gallons a year and reduce greenhouse gases by the equivalent of taking 385 cars off the road.

NYPA People

New Faces

NYPA's finances have a new steward in Adam Barsky, who was named executive vice president & chief financial officer in July. He previously served as chief of staff and special counselor at the Port Authority of New York and New Jersey, after serving as executive vice president and chief risk officer of IDB Bank NY. Barsky is also chairman of the Nassau County Interim Finance Authority.

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A program to fulfill ambitious clean energy goals can only succeed with a nimble strategy that encompasses all of NYPA's operations and the ever-evolving energy marketplace. To ensure NYPA stays on track, Yves Noel was named to the new position of senior vice president, Strategy and Corporate Development. He has more than 15 years of management consulting experience at the Oliver Wyman Group and Booz Allen Hamilton.

NYPA also has an experienced hand taking on a critical role. Bryant Bullard was named regional manager for Northern New York. He had been general maintenance superintendent/licensing manager at the St. Lawrence-FDR Power Project, where he oversaw the inspection and maintenance of the project's dams and dikes.

A Thriving Workplace

The most important asset at NYPA has always been our people.

Time after time, they solve problems great and small. Our employees thrive in a workplace filled with constant challenges. Others have noticed. For the second straight year, Forbes recognized NYPA as one of America's best mid-size employers, ranking second among utilities and 52nd on a list of 500 companies.

Our employees work hard and play hard, too, even on the job. At NYPA's first Engineers Cup, there were 27 teams competing to each build a 15-inch structure in 20 minutes using only rubber bands, paper clips, tape and spaghetti. The challenge was to see how much weight the towers could hold before collapsing. The winning structure withstood 44.2 ounces of metal nuts and four cellphones.

Fifty-two NYPA employees participated in a statewide apprentice training program in collaboration with International Brotherhood of Electrical Workers locals 2104 and 2032. The program prepares workers for jobs in clean energy industries. It allows workers who complete an apprenticeship to receive a journeyman card, which opens the door to new and better-paying opportunities.

NYPA is known nationally for a culture of innovation that has defined new paradigms for public utilities. That's one reason why NYPA President and CEO Gil C. Quiniones was named ETS Thought Leader of the Year by Zpyrme, which runs the prestigious Energy Thought Summit.

CANALS

The Erie Canal Continues to Be Reimagined

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The momentum to transform the Erie Canal into a waterway that's vital and essential to upstate communities continued in 2019 when Governor Cuomo announced in May the Reimagine the Canals initiative. It had five goals:

- Identify potential new uses for the Erie Canal to improve the quality of life for New Yorkers.
- Evaluate how the canal can support and enhance economic development along the canal corridor.
- Find new opportunities to bolster recreation and tourism along the canal.
- Assess how the canal can mitigate impacts from flooding and ice jams to improve resiliency and restore ecosystems.
- Identify how to use canal infrastructure to expand irrigation for Western New York farms.

A blue-ribbon task force was convened to hold meetings last summer to get the public's input and to evaluate ideas from technical experts. The task force forwarded its recommendations to the Governor Cuomo in December.

Making Something Old New(er) Again

The 524-mile Canal System finished its 101st year of operation in 2019. While crews were hard at work rehabilitating equipment during the busy winter maintenance season, new features were added on and off the water to make the canals an even more attractive place to spend time.

A \$10 million dredging project was completed at the Inner Harbor, near downtown Syracuse, to allow recreational boats to travel there. The once-industrial area is being transformed into a destination neighborhood, with new apartments, shops, restaurants and a hotel.

New portions of the Erie Canalway Trail opened in central and western New York, as remaining sections are built in time for the opening of the Empire State Trail (EST) in late 2020. The EST will be a 750-mile trail network, stretching from the City of New York to Canada and from Albany to Buffalo on the Canalway Trail. Ground was also broken on new sections of the Champlain Canalway Trail.