2019 Year in Review Next Generation Niagara Our Biggest-Ever Modernization Project ISO 55001 Becoming Asset Savvy **EVolve NY** Growing EV Infrastructure Reimagine the Canals Expand Tourism and Recreation, Reduce Flooding, Restore Wetlands NEW YORK NY Power Canal Corporation STATE OF OPPORTUNITY...

Trustees



John R. Koelmel Chairman



Eugene L. Nicandri Vice Chairman



Michael Balboni Trustee



Tracy B. McKibben Trustee



Anthony J. Picente, Jr. Dennis Trainor Trustee



Trustee

Our Mission

Power the economic growth and competitiveness of New York State by providing customers with low-cost, clean, reliable power and the innovative energy infrastructure and services they value.

A Message From the Chairman

Two years from now, the New York Power Authority (NYPA) will celebrate its 90th anniversary. We look ahead to that celebration with great pride for all we have accomplished and even more enthusiasm about what we will achieve in the years ahead.

NYPA is a dynamic organization that is passionately committed to our clean energy mission and what we must do to make substantial contributions to critically important initiatives such as electric vehicles. storage and offshore wind. Also apparent is that we have a significant responsibility to maintain our complex infrastructure projects in Western and Northern New York to ensure we will help supply New York State with renewable electricity for the rest of the 21st century.

Most exciting is that NYPA is a truly unique public utility with an unmatched ability to constantly reinvent itself. We live in a period of continuous technological change where the unimaginable becomes plausible within an amazingly short period of time. It is thrilling to see NYPA constantly respond to the myriad of scientific, economic development and human resource opportunities and challenges.

Every one of our facilities strives to be best-in-class, and the cumulative results of their activities are commendable and impressive. We are equally proud of our efforts to meet and exceed the needs of our customers, a primary goal of our Strategic Vision 2020.

Our passion and commitment are now also impacting the New York State Canal Corporation, for which we are launching an exciting "reimagine" initiative. One of New York's greatest assets for almost three centuries, the Canals team is now pursuing a creative and innovative series of long-term plans and activities designed to create significantly greater value for the beautiful communities along its waterways. We want to ensure people from around the world benefit from and take advantage of all that the Canals offer.

Over the past few weeks, I have enjoyed reviewing NYPA's end-ofthe-decade highlights and major accomplishments of the last 10 years. While there has been significant debate as to what it all means looking forward, I am very proud that NYPA and the Canal Corporation finished 2019, and are poised to start the new decade, with unprecedented strength and momentum. We look forward to a very bright future for our organization and, more importantly, all of New York and those we serve.

Sincerely,

John R. Koelmel

January 2020

Executive Management

Gil C. Quiniones

President and Chief Executive Officer

Adam Barsky

Executive Vice President and Chief Financial Officer

Justin E. Driscoll

Executive Vice President and General Counsel

Joseph Kessler

Executive Vice President and Chief Operating Officer

Kristine Pizzo

Executive Vice President, Chief Human Resources and Administration Officer

Sarah Orban Salati

Executive Vice President and Chief Commercial Officer

Yves Noel

Senior Vice President, Strategy and Corporate Development

Robert Piascik

Senior Vice President and Chief Information Officer

Karen Delince

Vice President and Corporate Secretary

Daniella Piper

Vice President, Digital Transformation Office and Chief of Staff



A Message From the President and CEO

Electric utilities like NYPA are in a challenging period.

The underlying premises of our industry keep changing as our customers become more sophisticated and demanding. They want to lower costs and have greater access to clean energy. They are looking for ways to reduce energy usage and create a cleaner environment for future generations.

It is hard to imagine another period in our careers when there is more uncertainty about what is ahead and more opportunity to accomplish great things. This is true for NYPA's Utility and Commercial operations groups, along with Shared Services, Information Technology, Law and Strategy.

These teams are collaborating with other parts of our organization to ensure NYPA is a major contributor to Gov. Andrew M. Cuomo's battle against climate change, to turn NYPA into the first end-to-end digital utility, and to be a champion of growing areas such as electric vehicles, offshore wind and energy storage.

This desire for significant transformation also applies to New York State's canal system, which is about to enter its third century of operation. While diligently maintaining the infrastructure of our nation's first and boldest public works projects, NYPA's subsidiary—the New York State Canal Corporation—is aggressively pursuing our Reimagine the Canals initiative to keep the system relevant for the next hundred years. We want to boost local economies, inspire new opportunities for tourism and recreation, and strengthen environmental resiliency along the historic waterway.

This desire to carry out extraordinary and lasting achievements is energizing the NYPA and Canal communities. As you will read in the 2019 Year in Review, the accomplishments of our employees are quite impressive and inspirational. Individually and collectively, our workforce demonstrates every day that the mission of public power and the story of our state's canals are more relevant than ever.

- Gil C. Quiniones

Sif C. animum

January 2020



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 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."

Issue: Risk of equipment damage tion: Inspect with inexpensive thermal imaging camera Result: Find hidden problems, maintain operations Asset Management ANDREW RUBY | Apprentice Operator

2019 NYPA YEAR IN REVIEW 3

ASSET SAVVY@STL

Left: Members of the Asset Management Working Group, which oversaw NYPA's successful effort to receive ISO 55001.

Top right: Our Asset Savvy approach continually develops, operates, maintains, upgrades and replaces assets in a manner that addresses all costs, risks and performance characteristics.

Bottom right: A substation in Middletown, part of NYPA's 345-kilovolt transmission system.



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 that generates the largest amount of electricity in the state. Known as Next Generation Niagara, it represents the largest infrastructure investment by NYPA and 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.
- 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, 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.

• 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

A \$93 million

project will install
digital communications
systems on
transmission lines

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 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 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.

Left (top to bottom): Penstock inspection at the Lewiston Pump-Generating Plant, part of the Niagara Power Project; new sonar technology deployed at the Gregory B. Jarvis Plant, Oneida County.

Right: NYPA signed a memorandum of understanding with two Irish entities—the Electricity Supply Board and EirGrid Group—to create and test grid and distributed power solutions.



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

Leading the Way Back in Puerto Rico and USVI

Hurricanes severly damaged the power grids in Puerto Rico and the U.S. Virgin Islands in 2017. When Governor Cuomo led the



first power restoration 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 governmentowned 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.



Left (clockwise from top left): NYPA and Canal Corporation STEM camp at Fulton-**Montgomery Community College; STEM** camp at NYPA's Blenheim-Gilboa Pumped **Storage Power Project; Environmental Justice** workshop at the Niagara Falls Boys & Girls Club; President and CEO Gil C. Quiniones tours a power facility in St. Thomas.

Right: Gov. Andrew M. Cuomo speaks at Alcoa, Massena.

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

Aa1 Rating driven by NYPA's prudent investments

"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 agen-

cies, 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 customers 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

Low-cost power from NYPA was the linchpin for a new sevenyear 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.

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 steamdriven chiller 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 of New York and New Jersey 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 solar photovoltaic and energy storage systems at seven countyowned 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

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.

Left top: Empire State Plaza, Albany.

Left bottom: New York City College of Technology, an energy efficiency customer.

Right: Jacob K. Javits Convention Center, Manhattan.



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, one of the state's largest private employers. This effort is in addition to the \$250 million commitment in 2018

\$3 million

in funding, provides zero-interest loans for EV purchases

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. This NYPA project will cut fuel usage by 200,000 gallons a year and reduce greenhouse gases by the equivalent of taking 385 cars off the road.

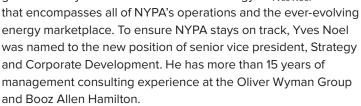


NYPA People

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.

A program to fulfill ambitious clean energy goals can only succeed with a nimble strategy



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.

From left: NYPA is helping JetBlue convert baggage tractors and belt loaders at John F. Kennedy International Airport, Queens, to electric power; employees participate in NYPA's inaugural Engineers Cup competition; Niagara Power Project IBEW leader Lou Fazzolari, left, with Western New York Regional Manager Harry Francois.



Adam Barsky



Yves Noe

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, a global media company, 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 betterpaying 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

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 Governor Cuomo in December.

Making Something Old New(er) Again

The 524-mile Canal System finished its 101st year of operation in 2019, when crews added new features 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 in Syracuse to allow recreational boat travel. The onceindustrial area is being transformed with new apartments, shops, restaurants and a hotel.

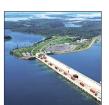
New portions of the Erie Canalway Trail opened in Central and Western New York, as remaining sections are built for the opening of the 750-mile Empire State Trail in late 2020. Ground was also broken on new sections of the Champlain Canalway Trail.

Above left: Kayakers paddle through the Waterford Flight of Locks on the Erie Canal.

Above right top: A section of the new Erie Canalway Trail near Mohawk, Herkimer County, is dedicated.

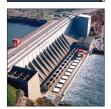
Above right bottom: A Canal Corporation tugboat is named after women's rights pioneer Elizabeth Cady Stanton at Corn Hill Landing, Rochester.

NYPA Generation and Transmission **Facilities**



ST. LAWRENCE-FRANKLIN D. ROOSEVELT **POWER PROJECT**

Type: Hydroelectric Location: Massena, St. Lawrence County Nameplate Rating: 1,088.0 MW* First Commercial Power: July 1958



NIAGARA POWER PROJECT

Type: Hydroelectric Location: Lewiston, Niagara County Nameplate Rating: 3,100.0 MW* First Commercial Power: January 1961



BLENHEIM-GILBOA PUMPED STORAGE POWER PROJECT

Type: Pumped Storage/Hydroelectric Location: North Blenheim and Gilboa, Schoharie County

Nameplate Rating: 1,160.0 MW* First Commercial Power: July 1973



RICHARD M. FLYNN POWER PLANT

Type: Gas/Oil

Location: Holtsville, Suffolk County Nameplate Rating: 170.0 MW* First Commercial Power: May 1994



FREDERICK R. CLARK ENERGY CENTER

Function: Coordinates NYPA generation and transmission system operations Location: Marcy, Oneida County

Opened: June 1980

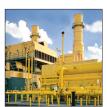


SMALL HYDRO FACILITIES

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

Combined Nameplate Rating: 36.8 MW*





SMALL CLEAN POWER PLANTS

Location: Six New York City sites and Brentwood, Suffolk County

Combined Nameplate Rating: 517.0 MW* First Commercial Power: June 2001



EUGENE W. ZELTMANN POWER PROJECT

Type: Gas/Oil

Location: Astoria, Queens County Nameplate Rating: 576.0 MW*

First Commercial Power: December 2005



TRANSMISSION FACILITIES

1,454.0 circuit-miles of alternating current transmission lines.

Size	Underground	Overhead	Total
765 kV	0.0	155.2	155.2
345 kV	42.9	884.3	927.2
230 kV	0.0	337.5	337.5
115 kV	1.8	32.3	34.1
Total	447	14093	1454.0

Source: Updated with data from 2019 NYPA Geographic Information System (GIS)

AFFILIATED FACILITIES

ASTORIA ENERGY II **

Type: Gas/Oil

Location: Astoria, Queens County Nameplate Rating: 660.0 MW* First Commercial Power: July 2011

**An independently owned facility that has a 20-year supply agreement to service NYPA's New York City governmental customers

HUDSON TRANSMISSION PROJECT (HTP) ***

Type: High-Voltage Transmission Line

Location: Seven-mile 345-kV line from Public Service Electric & Gas Co.'s Bergen Substation in Ridgefield, NJ, to Consolidated Edison Co.'s West 49th St. Substation in Manhattan. (Includes four-mile Hudson River underwater section)

Capacity: 660 MW

First Commercial Operation: June 2013

***NYPA has a 20-year firm transmission capacity purchase agreement with Hudson Transmission Partners, LLC, the developer, owner and operator of the line. NYPA contracts for 87 percent of HTP's transmission capacity, or up to 575 MW.

^{*} Nameplate Rating: The maximum rated output of a generator under specific conditions designated by the manufacturer, as defined by the United States Energy Information Agency. As submitted by NYPA for inclusion in the 2019 Load & Capacity Data ("Gold Book"), The New York Independent System Operator, Inc.







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Front Cover: An inspection of a Niagara River water conduit, which serves the Niagara Power Project, Lewiston.

Back Cover: Lansing Manor, adjacent to the Blenheim-Gilboa Pumped Storage Power Project's Visitors Center, is an early American country estate filled with authentic 19th century furnishings. NYPA owns and operates Lansing Manor, which is listed in the National Register of Historic Places.