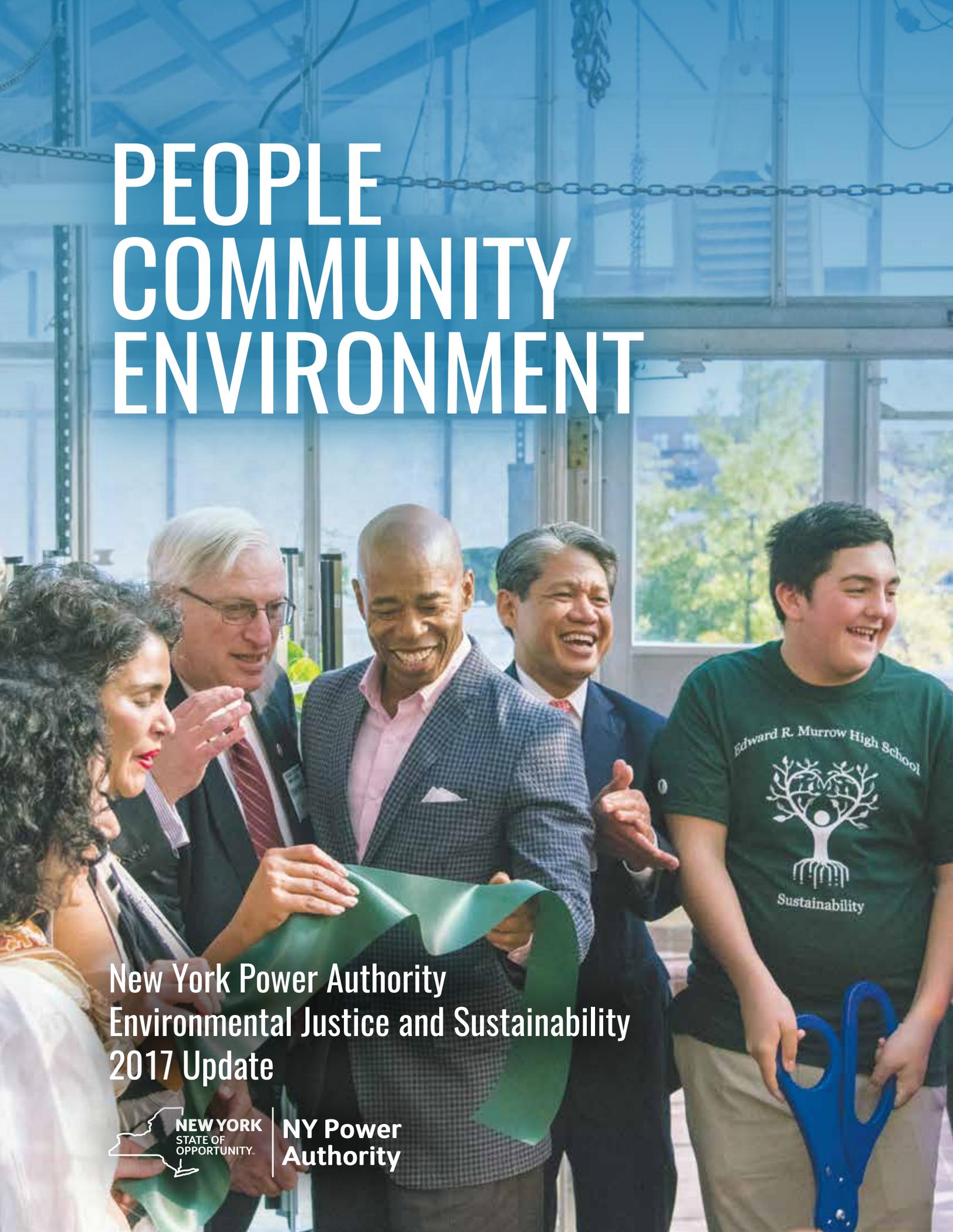


PEOPLE COMMUNITY ENVIRONMENT

New York Power Authority
Environmental Justice and Sustainability
2017 Update



**NY Power
Authority**





NYPA's 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.

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Dear Readers:

The New York Power Authority (NYPA) is the largest state-owned power organization in the United States. With 16 generating facilities, and more than 1,400 circuit-miles of transmission lines, our reach extends across the state and beyond. More than 70 percent of the electricity produced by NYPA is hydropower, one of the most important sources of safe, renewable energy.

Because we have learned to harness New York State's natural resources, we have embraced our historic role as environmental stewards. Moreover, as responsible neighbors, we place a special emphasis on developing an ongoing relationship with those communities that lack access to the many opportunities available to others. NYPA, therefore, places the highest priority on the development and implementation of our Environmental Justice and Sustainability programs. Over the past few years, we have been aggressively building on our already strong record of achievement in these critically important areas.

Our relentless focus is both inward and outward. We are changing NYPA's culture while at the same time proactively collaborating with cities, towns and villages across New York to provide programs and services that will improve the quality of life, now and into the future. These include Science, Technology, Engineering and Math-based (STEM) education, teacher training, mentorships, internships and up-to-date energy information for low-income homeowners and renters.

We are also integrating sustainable best practices in every area of our company by digitizing many of these initiatives to measure our progress on an ongoing basis. NYPA has fully embraced sustainability because it is good business, and because it preserves the integrity of the environment, a fundamental right and obligation of all New Yorkers.

As you read this book, you will see how our Environmental Justice and Sustainability programs intersect to create a compass that guides our efforts in a rapidly changing industry. Together, they are the pillars upon which NYPA's corporate responsibility infrastructure is built, as we strive to become a national leader.



GIL C. QUINIONES
President & Chief Executive Officer



NYPA's presence in New York is significant. Given our large footprint, there is an inherent responsibility to act in the best interest not only of our company, but of those of the underserved communities located near our assets. The intersection of Environmental Justice and Sustainability speak directly to this responsibility. The more we can integrate sustainable, energy efficient practices into our operations, the less power needs to be generated. And when we optimize the operation of a generator or a transmission line, the less impact it has on the community.

In relaunching our Environmental Justice program in 2017, we went back to the underserved communities located near our facilities to begin a new and ongoing dialogue about their needs and concerns. We identified STEM education support as a high priority, not only for the host communities but for developing a highly skilled workforce. Access to the best our education system has to offer is the right of every child. I know that proficiency in STEM helps open a world of opportunities and career possibilities. Similar to our STEM efforts, the larger portfolio of Environmental Justice programs are designed with the same sensitivity to filling a need of the individual community.

I learned from an early age that protecting the environment is everyone's responsibility. That is why I am so proud of our Sustainability program. The Sustainability program demonstrates that we are walking the walk and going above and beyond to make sure that NYPA is reducing its carbon footprint by embedding sustainable best practices in all our operations. In 2017, we have accelerated the digitization of our sustainability efforts using data and analytics to measure program results and identify new areas for improvement.

This book is a lens through which NYPA views our corporate responsibility. Many people are a part of helping us fulfill our obligations. You will read about some of them. They represent a cross section of our employees and the many unsung heroes in our communities that make New York the great state it is.



KIMBERLY HARRIMAN
Senior Vice President
Public and Regulatory Affairs

As the new Vice President of Environmental Justice and Sustainability, I traveled the State meeting with community leaders, immigrant groups, environmentalists, low income homeowners, students, and local elected officials. The stories they shared humbled me and awakened me to the indomitable spirit of New Yorkers.

Every story was unique and they were as varied as their communities. However, all the New Yorkers I spoke to had one thing in common; the universal drive to make life better for their families and each other. I am excited that we can share their stories with you.



LISA PAYNE WANSLEY
Vice President
Environmental Justice and Sustainability



Why Environmental Justice and Sustainability Are Important to NYPA

NYPA embraces Sustainability and Environmental Justice as core corporate values. As a predominantly hydroelectric utility, operating in a clean and sustainable manner is the cornerstone of what we do. We strive to promote economic growth, environmental stewardship and social equity for all New Yorkers, and believe it is especially important to support communities that have been historically underserved.

New Yorkers are entitled to a sustainable economy. Our Sustainability program underscores NYPA's response to this imperative. The program is driving sustainable performance across every business function, from supply chain to waste management. At the same time, we are encouraging our employees to make smart choices in their everyday lives that help lower the human impact on the environment.

NYPA's Environmental Justice program is an outward expression of NYPA's commitment to sustainability. By providing STEM education, mentorship and energy efficiency initiatives, we empower our neighbors to make life choices that will help improve and sustain a better quality of life. That is a goal that all New Yorkers can embrace.

Environmental Justice at NYPA: Being a Good Neighbor

The Environmental Protection Agency (EPA) defines Environmental Justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. The EPA has this goal for all communities and persons across this nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, has equal access to the decision-making process and a healthy environment in which to live, learn and work.

<http://www.epa.gov/environmentaljustice>

Using the EPA framework, NYPA is committed to improving the quality of life of underserved and minority communities located near our statewide facilities. Community collaboration and engagement is the hallmark of our efforts. We seek to develop innovative programs to meet the unique needs of the people living in these communities.



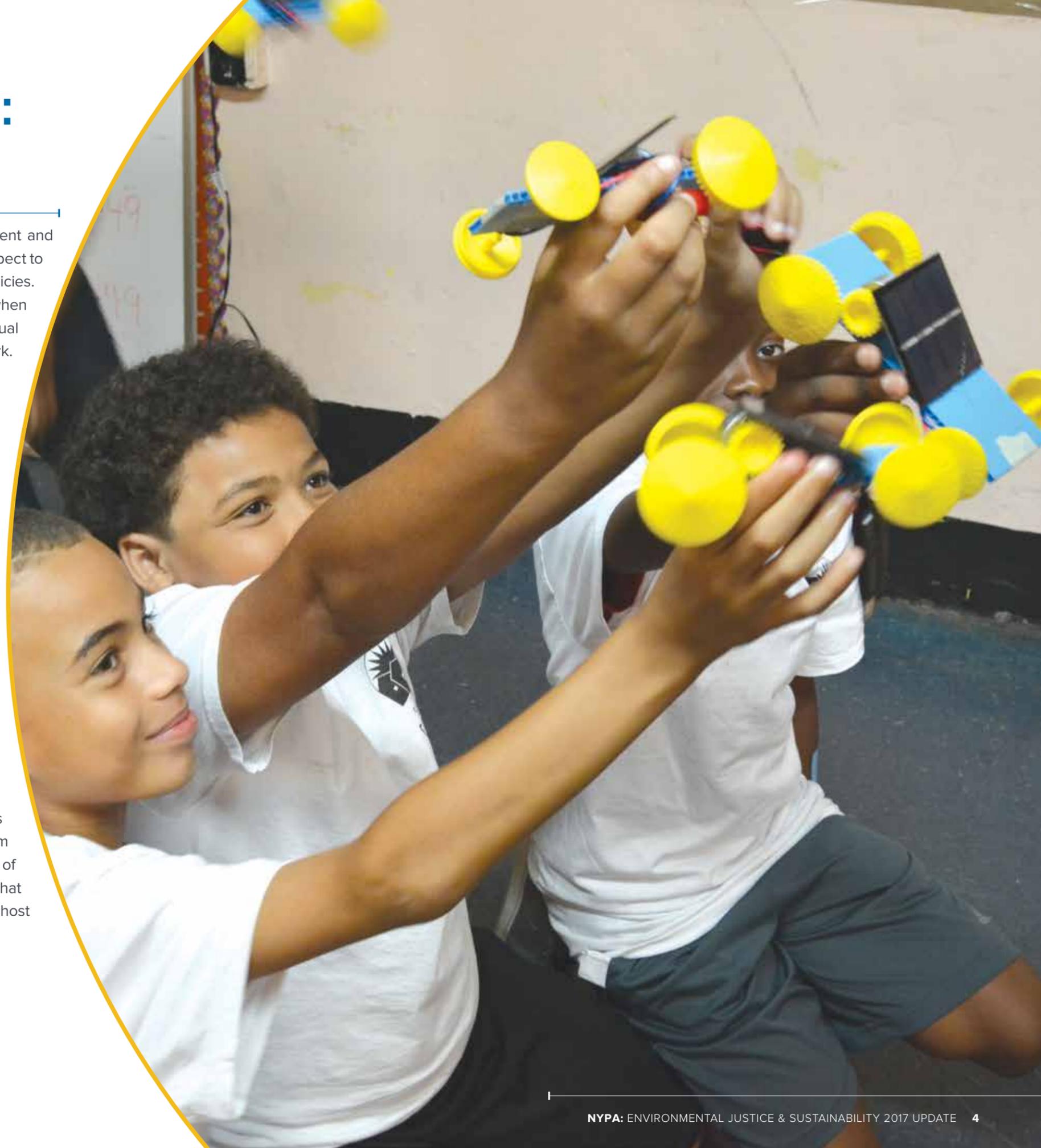
LISA PAYNE WANSLEY

Vice President

Environmental Justice and Sustainability

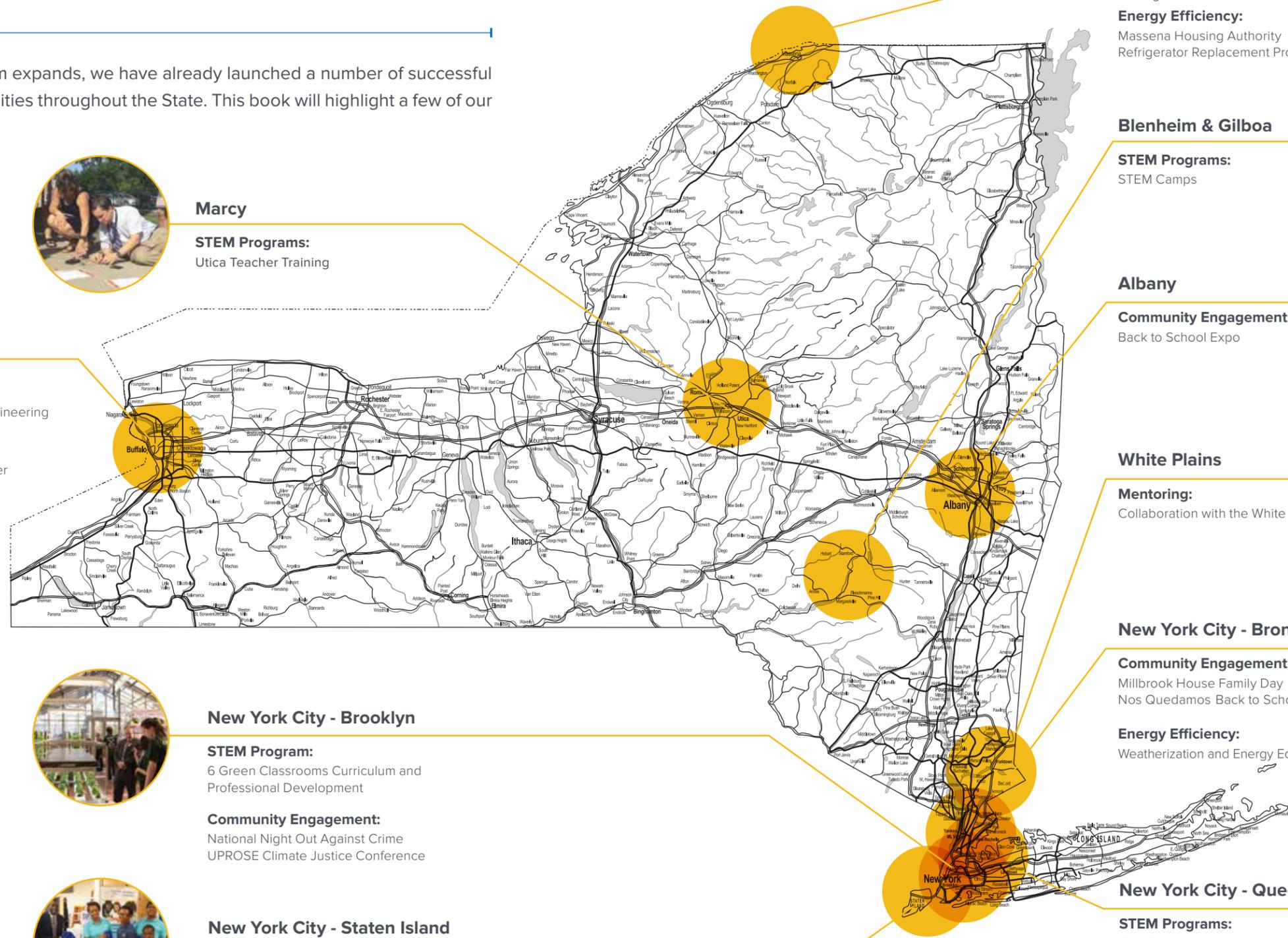
“In NYPA’s Environmental Justice communities, we seek to leverage our expertise and resources to help uplift the people who live and work in these areas.

The residents and families in these communities are our neighbors. We seek to build long-term relationships by listening empathetically and partnering with them to identify tangible ways NYPA can help offset some of their challenges. In all that NYPA does, we recognize that we are stronger together. It’s not only good for our host communities, it also makes good business sense.”



Environmental Justice Programs & Initiatives

As our Environmental Justice program expands, we have already launched a number of successful initiatives in our neighboring communities throughout the State. This book will highlight a few of our projects from these communities.



Buffalo

Mentoring:
SUNY Buffalo
Women in Science and Engineering

Energy Efficiency:
The Belle Center
Westside Community Center
Weatherization and Energy
Education Workshops



Marcy

STEM Programs:
Utica Teacher Training



New York City - Brooklyn

STEM Program:
6 Green Classrooms Curriculum and
Professional Development

Community Engagement:
National Night Out Against Crime
UPROSE Climate Justice Conference



New York City - Staten Island

STEM Program:
The Eagle Academy

Massena

STEM Programs:
St. Regis Mohawk Tribe - Johnson O'Malley Program

Energy Efficiency:
Massena Housing Authority
Refrigerator Replacement Program



Blenheim & Gilboa

STEM Programs:
STEM Camps



Albany

Community Engagement:
Back to School Expo



White Plains

Mentoring:
Collaboration with the White Plains Youth Bureau



New York City - Bronx

Community Engagement:
Millbrook House Family Day
Nos Quedamos Back to School Day

Energy Efficiency:
Weatherization and Energy Education



New York City - Queens

STEM Programs:
The Floating Hospital Curriculum and
Professional Development
Woodside Houses STEM Camp

Community Engagement:
Queensbridge Houses Back to School Event
National Night Out Against Crime



A Focus on STEM Education

When asked “How can NYPA help you?” the response in all our communities was universal. There is a need for more resources to support STEM education in disadvantaged communities.

The problems are well known, but the statistics are still startling. Science and mathematics achievement gaps along racial, ethnic, linguistic, and socioeconomic lines have widened substantially over the past 20 years. Scores on the National Assessment of Educational Progress (NAEP)—known as “the nation’s report card”—reveal gulfs that start in 4th grade and just keep growing.

STEM education is a key focus of our Environmental Justice program and is closely aligned with Governor Cuomo’s commitment to closing the STEM achievement gap between lower income and children from higher income families.

“With STEM fields linked to the enrichment of New York’s education system and new economic opportunities, it is imperative that students in underrepresented communities across New York have access to programs in those disciplines. Students can diversify their skills and become more talented in fields that will foster growth and innovation for future New York State.”¹

- Governor Andrew M. Cuomo



The State of STEM

STEM (Science, Technology, Engineering and Math) education is a key pillar in our mission to improve the quality of living and future career prospects for children living in marginalized communities.

The workforce of the future is evolving every day. The most sought after jobs in 10 years may be unimaginable today. We do know that jobs emerging at the forefront of our changing culture heavily rely on a foundation of STEM skills. Engaging children in STEM early in life will prepare them to be successful and create a positive impact in the workforce of tomorrow.

NYPA’s current STEM education program is primarily aimed at engaging the imagination and curiosity of younger students in primary school and junior high. Through fun, interactive and enriching workshop activities, we highlight the relevance of STEM in daily life. Further development of these skills will prepare them for high-demand workforce opportunities, where students can make meaningful contributions to advancements that will positively impact society.

 QUICK FACTS:

Less than 1 in 10
STEM professionals
is a minority or
woman.²

NYPA STEM Curriculum and Activities

NYPA's STEM programs are offered statewide and are designed to be fun and interactive. The programs are provided to students in communities that host our facilities. Our programs supplement and enhance the existing school curriculum.



Electricity, Energy and the Environment:

We explore answers to fundamental questions:

- How are fossil fuels created?
- What are the different forms of energy?
- How is energy transferred and stored? How is electricity generated?
- What types of fuel are used to operate a power plant?



Climate Change and Global Warming:

Students learn the importance of energy audits, energy efficiency measures and renewable energy generation.



Renewable Energy Sources:

We explore the impact and creation of energy through renewable, clean electric generation sources including, solar, wind and hydropower.



Energy Storage:

We demonstrate and explain how batteries work, and let students build a battery on their own.



Wind turbine design contest:

We practice designing wind turbine blades to see which design produces the highest power output, and what you can do to make more efficient blades.



Spotlight

Our programs are designed to create a spark of interest in kids by engaging them in fun, interactive lessons about energy, with an emphasis on renewable resources. Experiments help reinforce energy concepts. By working together in teams, students learn to think creatively and work collaboratively.

STEM proficiency is a critical 21st century skill that every student must learn or risk being left behind in education and future job opportunities. The program NYPA has developed in conjunction with Solar One, really helps kids make this connection.

As an engineer and someone who knows firsthand the value of a diverse workplace, I was thrilled when one of our 5th grade girls told me, "This is so much fun! I can't believe that I could actually get a job doing experiments and solving problems. That's awesome!"

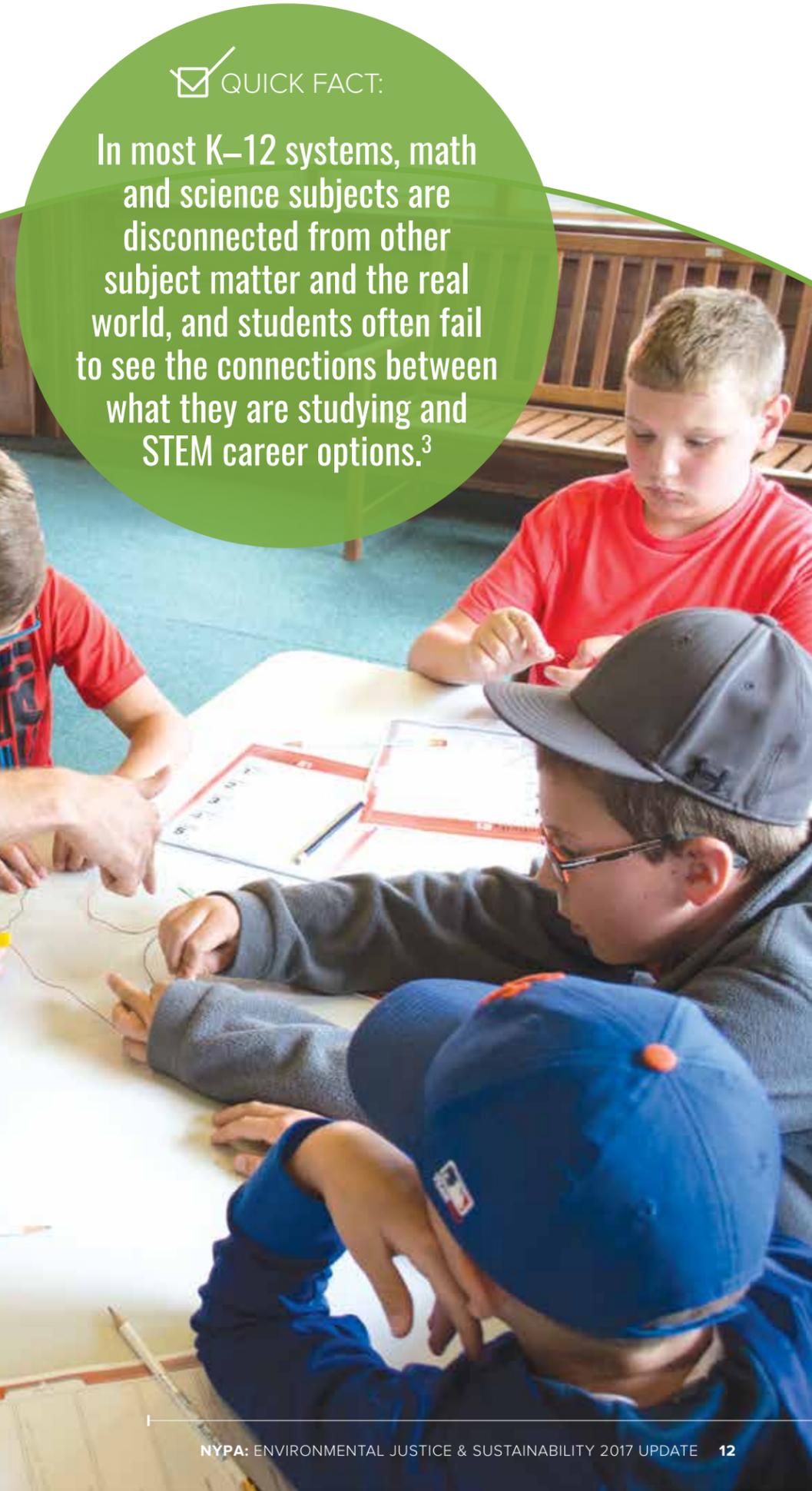


KAELA MAINSAH
Manager
Environmental Justice
White Plains, NY

STEM: Filling the Workforce Pipeline

STEM expertise is critical in the electric utility industry, as technology is continuously changing. Systems are being digitized and we rely more and more on data, metrics and analytics. As a result, a highly-skilled, motivated and diverse workforce is essential to our success.

The electric utility industry workforce is aging and NYPA is no exception. It is estimated that 30% - 50% of all utility employees will be eligible to retire in the next five years. We need to fill the pipeline with STEM proficient students now to address this challenge. Utility jobs cross a multitude of disciplines: engineers, IT and digital specialists, strategic planning analysts, just to name a few. In the 21st century economy, a strong foundation in STEM is the pathway to success for our industry and future employees.



 QUICK FACT:

In most K–12 systems, math and science subjects are disconnected from other subject matter and the real world, and students often fail to see the connections between what they are studying and STEM career options.³

Spotlight

“I have had a long career at NYPA and will retire soon. My co-workers and I would love to see a system created where we can pass on our knowledge and skills to new hires, just as these things were shared with us when we first joined NYPA.”



JOE ROBERTACCIO
Senior Environmental Engineer
Marcy, NY

Green Classrooms

NYPA is partnering with NYC schools in our Environmental Justice communities to fund the development and delivery of a science curriculum that supports this multifaceted approach to STEM learning. In conjunction with the Brooklyn Borough President's Office, NYPA is providing innovative curriculum support and teacher development to six area schools. The Green Classrooms program utilizes space within each school where students grow "crops". Teachers then connect students' experience in the greenhouse with innovative lessons focused on earth science, climate change, conservation and food production, nutrition and sustainable development.



Community Educator Support

We want the legacy of our STEM efforts to grow year after year. One of the best ways of passing on knowledge is to teach the teachers. That is why we developed programs to support educators at afterschool programs.



Mentorships

The correlation between mentors and future success in the work environment is indisputable. NYPA professionals from a variety of departments volunteer to speak to high school and college students to share personal stories about career possibilities. They also make themselves available as students navigate new challenges. Mentorships are especially important for students from our Environmental Justice communities that may be the first in their families to attend college. Many NYPA professionals come from similar backgrounds and can relate to the students in a unique way. Their experience can help students make a successful transition to college.



After School Programs

Parents view afterschool programs not just as a safe environment for children, they also recognize that programs provide a wide range of activities and enriching learning opportunities for children.

There are distinct differences in afterschool participation and demand across income levels and ethnicity. Participation in and demand for afterschool programs are much higher among children from low income households compared to higher income households. Demand is especially high among African-American and Hispanic children.⁴

In response to this need, NYPA launched several self-sustaining afterschool programs.



QUICK FACT:

60% of college graduates who participated in an internship received at least one job offer, and 83.4% of employers say that their internship program is designed to help their organization recruit entry-level hires.⁵

Energy Education And Weatherization Workshops

NYPA conducts workshops to support low-to-middle income homeowners and renters. Participants learn about simple ways to lower their heating and cooling costs, and change the way they use energy by making low cost improvements to their homes.

These interactive sessions are taught by energy educators from partner organizations such as PUSH Buffalo. After each workshop, NYPA distributes no-cost weatherization kits containing many of the measures discussed during the program.

These workshops are an example of our commitment to reach people where they live. In Hispanic communities, NYPA has also provided Spanish translation support.



QUICK FACT:
Low-income households devote up to three times as much income to energy costs as average households in the same city.⁶



YUBETZY POWELL
Travel Manager
White Plains, NY

“NYPA’s energy education workshops send a strong message to communities where many people are struggling to pay high energy bills. The programs demonstrates that we care about their concerns. These workshops are designed to educate and empower people to make energy decisions that are right for them. By the time the workshop was over, the response was really heartwarming. So many people came up to me to express their gratitude for what NYPA is doing.”



Community Engagement

We support our community partners by attending events sponsored by various organizations in Environmental Justice communities. We use these opportunities to educate the public about the value of clean, renewable energy and how to live a more environmentally responsible and sustainable lifestyle.

Energy Efficiency Refrigerator Replacement

A refrigerator can be one of the most energy-intensive appliances running in a home, and also a large source of electricity waste when not operating efficiently. Replacing old refrigerators helps homeowners save money on their monthly electric bills, and ultimately reduces the amount of energy that a power provider needs to generate.

In 2017, our Environmental Justice staff reached out to the North Country’s Massena Housing Authority to learn more about the financial challenges of running a quality public housing program for low income residents. Together, we decided that a refrigerator replacement program would help relieve financial burden. At no cost to residents, NYPA will replace old and worn refrigerators with energy efficient models. This program will be formally launched next year.



QUICK FACT:
Energy Star-certified refrigerators can operate on less energy than a 60W lightbulb.⁷

Case Study

The Floating Hospital

Over 150 years old, The Floating Hospital family health network is New York City’s largest provider of primary healthcare services to families living in family shelters and domestic violence safe houses.

Families who come to the hospital often receive several services in one day. The waiting times can be long and children get restless. Inside the waiting room is a classroom where educators can offer parents and children an opportunity to learn about different subjects.

NYPA has delivered an energy science curriculum, complete with simple and fun experiments adapted for children from elementary through junior high school. The lessons have been designed to accommodate the short time children may be able to visit the classroom.



“If you look at how homeless youth do in schools, they typically do worse on their standardized tests, and they are less likely to graduate from high school. NYPA’s STEM curriculum opens up new opportunities for these kids, especially when you teach them to learn about science and technology with fun, hands-on activities. It heightens their interest in these fields, and makes them feel a little more confident in their regular classes in school.”



MEGHAN MILLER
Director, Health Education
The Floating Hospital

“When I learned about NYPA’s efforts with Environmental Justice communities, I thought ‘Wow, this would really help our kids!’ NYPA customized a STEM program and teacher training to meet the unique needs of The Floating Hospital. Many homeless children don’t have the chance to get this type of enrichment.”



CYNTHIA DAVIS
Director, Community Outreach
The Floating Hospital



Case Study

Woodside Community Center

The Woodside Community Center is a safe haven for kids and parents in Queens. The Center operates afterschool programs and a summer camp with activities designed to address the individual interests of children. The Center’s innovative programs allow kids to explore numerous activities including sports, computer science, music and world culture. NYPA enhanced these offerings by providing two-day STEM camps.



DIANNE ADLAM
Director
Woodside Houses
Community Center

“Providing a science program exposes the kids to careers and opportunities they probably would have never heard of if they weren’t involved with this program. It is a very unique blessing. Making solar powered cars and talking about alternative energy are things that they may not have been aware of or been exposed to before this program. It is invaluable to get support from groups like NYPA to enrich what we can offer.”



Case Study

Saint Regis Mohawk Tribe: Johnson O'Malley Program

The mission of the Johnson O'Malley (JOM) program is to address the unique cultural needs of American Indian students attending public schools through a supplemental program of services planned, developed and approved by the Local Indian Education Committee.

Earlier this year, students from the St. Regis Mohawk Tribe's JOM program attended a 2-day STEM Camp at NYPA's Visitor's Center located in Massena, New York. Three high schools sent student representatives who performed energy related experiments including creating their own wind turbine. Environmentalists from our Eugene Nicandri Nature Center also took the students on a hike to explore the local ecology.

"During the workshop, students had a chance to speak to NYPA engineers, who shared their career stories. Among them was Akwesasne local, Noah Bero. He dropped in during lunch to talk to the students about his career as an electrical planner. The high schoolers took home a better understanding of engineering and other technical careers that are available at NYPA."



SAMANTHA PHILLIPS
Johnson O'Malley Program Manager
St. Regis Mohawk Tribe



Case Study

United Neighborhood Houses: After School Programs

UNH was founded 100 years ago and its mission is still relevant today. It provides a wide range of human services designed to improve the quality of life, restore dignity and give a voice to those living in low-income, underserved communities.

The UNH has 38 "settlement houses", or community centers, located throughout New York City. NYPA is conducting 5-week energy related afterschool programs for community centers located in Queens, Staten Island, Brooklyn and the Bronx.

The impact of robust afterschool programs may be surprising. Effective afterschool programs can improve classroom behavior,⁸ school attendance, academic aspirations, and reduce the likelihood that a student will drop out of school.⁹

Case Study

Edward R. Murrow High School

Urban farming. The words may seem mutually exclusive, but in Brooklyn, NYPA is partnering with the Brooklyn Borough President’s Office to help K-12 students become “farmer-scientists” in one of the City’s most innovative STEM programs. The Green Classrooms initiative is an immersive learning experience whereby students are growing and harvesting sustainable, organic produce in greenhouses located within their school.

The Greenhouse Classroom in Edward R. Murrow High School is both a science lab and an urban farm that includes hydroponic growing systems, a composting station and an aquaponics system. The greenhouse provides a year-round space to teach students about environmental sciences, climate change, conservation, food production, nutrition and sustainable development. NYPA is supporting six schools by funding a curriculum that fully leverages the learning experience in the green classroom.

Over 200 – 400 plants can be grown in the classroom at any given time, with yields of roughly 2,000 lbs of lettuce, herbs, microgreens, cucumbers, tomatoes, eggplants and squash. The food is used for school snacks, cooking demonstrations, afterschool programs, community donations and student-led farm stands.

The Green Classroom is a vital vehicle to introduce healthy food choices to children who frequently have limited access to affordable and nutritious options.



CARLOS REYES
Assistant Principal
Edward R. Murrow High School

“Green Classroom has always been a dream of mine, and I know this is just the beginning. Next, we want to redesign the adjacent classroom next to the greenhouse science lab to provide space for research and development. In the future, we hope to incorporate solar panels and wind turbines to supply power to the greenhouse. I believe our green classroom will inspire other schools to try this engaging way of learning.”

Case Study

Westside Community Center

The Westside Community Center is located in West Buffalo, NY. Its staff is deeply dedicated to this diverse neighborhood, offering a wide range of services and community outreach to children, adults and seniors. The community center hosted our first Energy Education and Weatherization Workshop for low income homeowners and renters in the region. For participants who often live paycheck to paycheck or on social security, we taught easy and affordable ways to increase the energy efficiency of their homes. This will lead to reduced utility bills, allowing them to spend these savings on other monthly needs.



CASIMIRO D. RODRIGUEZ, SR
President
Hispanic Heritage Council of
Western New York

“NYPA has been going to where the needs are, and where the people live. For NYPA to be able to come to a community like ours and bring a weatherization program is a huge milestone. A lot our residents do not know where to get these services; NYPA is really answering a need for education about energy choices. This is invaluable for homeowners and members of this community.”



Sustainability at NYPA

Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹⁰ This business approach uses a *triple bottom line* accounting framework that balances economic, environmental and social priorities for long-term value creation. More and more companies are embracing sustainability as a competitive business strategy, recognizing that economic growth, environmental stewardship and social equity are interconnected.

As the global economy and population continue to grow, society’s impact on the environment and its use of natural resources is increasing at an unsustainable rate. It is becoming more and more urgent to transition to a renewable-resource based economy.

Clean energy is key to a sustainable future. Our society is energy intensive – we use energy in every aspect of lives – to manufacture products, power buildings, move people and goods, and conduct everyday activities. With the impacts of climate change, the transition from fossil fuels to renewable energy is becoming increasingly critical, and the public and private sectors must act. New York State has taken on the challenge, setting ambitious climate change and renewable energy goals.





NYPA and Sustainability

NYPA is playing an instrumental role in the transition to a clean energy economy in New York. With 70 percent of NYPA's electricity generated from hydroelectric facilities, and with aggressive solar, wind, energy efficiency and transportation electrification programs, the Authority is leading in clean energy. Building on this strong foundation, we are seeking to demonstrate sustainability leadership in every aspect of our business, from building and fleet management, to supply chain and employee engagement.

NYPA is setting targets to drive sustainability performance across its operations, and we are using digital tools to measure, manage and communicate our progress. These tools help us make data driven decisions that optimize resources and reduce costs. And by sharing results real-time, we engage employees and inspire behavior that supports these efforts.

Sustainability is a collaborative process. We work with engineers and scientists to improve operational efficiency, and with volunteers at every site to change workplace practices and promote a culture of sustainability. Sustainability is about all of us, and we depend on the engagement and support of all employees to achieve our goals.



KERRY-JANE KING

Director, Sustainability
White Plains, NY

“We are integrating sustainability into every aspect of our business and embedding it in day-to-day decision making. By taking a comprehensive approach to sustainability management, we are not only doing the right thing but adding value and increasing our competitiveness. As we move forward, we will share what we learn with our customers and local communities to help them achieve their own sustainability goals.”

Current Focus Areas

The recent work of the Sustainability team has focused on improving resource efficiency and reducing greenhouse gas emissions across NYPA facilities, vehicle fleet, supply chain and waste management processes. We are identifying ways to conserve resources and reduce NYPA's environmental footprint while also lowering costs.



“We have the opportunity to be a model—not just in our own industry but in others as well. Generation and transmission are our core business, but other aspects of our business are common to most industries, and we can demonstrate sustainability leadership in those areas as well.”

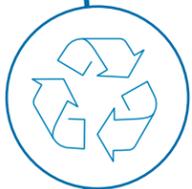
JOSEPH KESSLER
Executive Vice President
and Chief Operating Officer
Niagara, NY



Energy and Carbon Footprint



Supply Chain



Waste Management

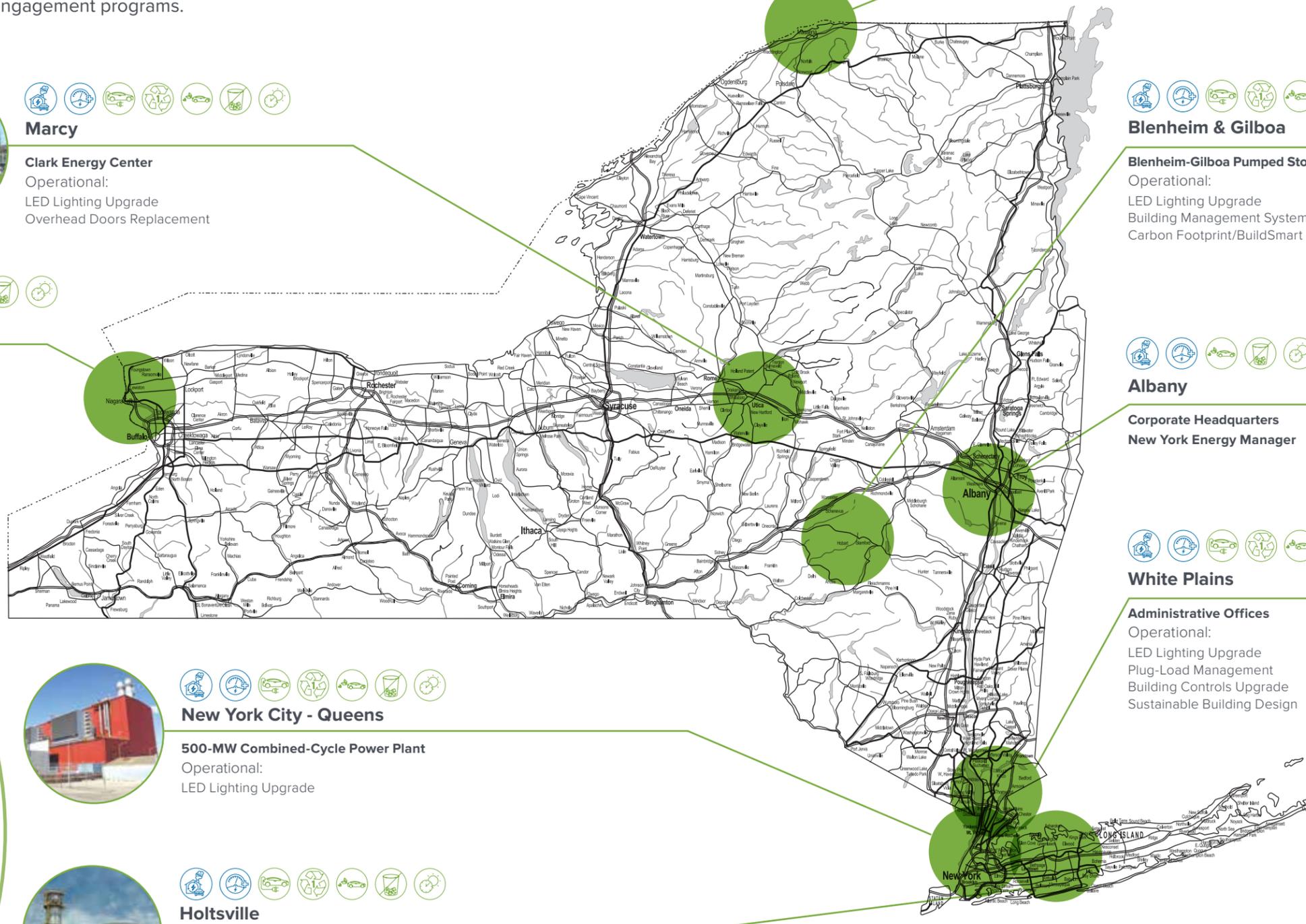


Employee Engagement



Sustainability Programs & Initiatives

We are working with multi-disciplinary teams across NYPA to achieve our sustainability goals through operational and employee engagement programs.



Marcy
Clark Energy Center
 Operational:
 LED Lighting Upgrade
 Overhead Doors Replacement



Lewiston
Niagara Power Project
 Operational:
 LED Lighting Upgrade
 Demand Flow Chiller Optimization
 Water Conservation Measures



New York City - Queens
500-MW Combined-Cycle Power Plant
 Operational:
 LED Lighting Upgrade



Holtville
Richard M. Flynn Power Plant
 Operational:
 Fleet Electrification



Massena
St. Lawrence - FDR Power Project
 Operational:
 LED Lighting Upgrade
 Overhead Doors Replacement
 High-Efficiency Insulation Measures



Blenheim & Gilboa
Blenheim-Gilboa Pumped Storage Power Project
 Operational:
 LED Lighting Upgrade
 Building Management System and Controls Upgrade
 Carbon Footprint/BuildSmart NY Program



Albany
Corporate Headquarters
New York Energy Manager



White Plains
Administrative Offices
 Operational:
 LED Lighting Upgrade
 Plug-Load Management
 Building Controls Upgrade
 Sustainable Building Design

Operational Programs:



Energy and Carbon Footprint



Expanded Submetering

Employee Engagement Initiatives:



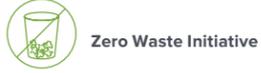
Workplace Charging Program



Refuse Single Use



Green Commute Campaign



Zero Waste Initiative



Daylight Hour & Efficiency Fridays

Our Energy and Carbon Footprint



The Carbon Footprint Program

The Carbon Footprint Program sets reduction targets for energy and greenhouse gas (GHG) emissions across all administrative and support buildings as well as light-duty fleet vehicles. Using New York State’s ambitious BuildSmart NY and Clean Fleets NY programs as critical building blocks, this program expands the scope to include additional buildings and vehicles, and sets reduction targets for greenhouse gases as well as energy.

As a utility, maximizing the value of clean energy resources is a priority for NYPA. This means increasing the efficiency of our buildings and the resilience of building subsystems. We actively seek projects that improve energy performance and minimize operating costs. Our approach is simple:

1. Utilize smart, interval metering to identify low-cost and no-cost energy conservation measures
2. Prioritize upgrades to equipment and building systems nearing end-of-life
3. Expand the scope of ongoing projects to include more efficient components
4. Accelerate planned projects that contribute to energy and carbon reduction goals

Collaboration is key to our success. The multidisciplinary teams we work with know their facilities better than anyone else, and most importantly, how to make them better. Project by project, these engineers, planners and technicians are helping us achieve our energy reduction goals.



PHILIP TOIA
Senior Vice President
Power Supply
Marcy, NY

“By investing in projects that promote sustainability, we get a greater benefit from our assets – we generate and transmit more electricity at lower prices. This is good for New York State as well as our employees because it gives us a competitive advantage.”



GEORGE QUINLAN
Electrical/I&C Superintendent
Gilboa, NY

“We generate most of our revenue from renewable energy sources, and we try to be friendly to the environment and carbon neutral in other ways too. We’re continually looking for ways to achieve more with less and utilize our resources effectively. These programs help guide our efforts.”



TOBY BOGART
Senior Civil/Structural
Engineer
Massena, NY

“What we do on a daily basis to be more sustainable changes how we operate. It reduces maintenance so we can do other things besides replacing light bulbs or fixing things that break down. Now we try to use materials that have more longevity to them.”

QUICK FACT:

Through BSNY, NYPA has reduced source energy consumption by more than 25 million source kBtu, enough energy to power more than 2,500 homes for a year.¹¹



Case Study

Niagara Demand Flow Chiller Optimization Project

Optimize the operational efficiency of the chiller plant that serves the Niagara Power Vista and portions of the Robert Moses Power Plant without sacrificing comfort or critical process temperatures.



Facility Upgrades



Installed variable frequency drives (VFDs) to increase/decrease the speeds of pumps to optimize energy consumption.



Improvements delivered through specialized programming in the building automation system.

Chiller Plant Operational Data



Operates an average of **4,416 hours/year** (May–October)

Produces **1,725,000 tons of cooling**

Project Specifics



Total investment **\$243,037**

Increased overall plant efficiency

Simple payback of **2.34 years**

From **1.16 kW/ton** to **0.645 kW/ton**

Annual savings of **\$103,509**

57% savings in kW/ton



MICHAEL CURCIO
HVAC Engineer
Niagara, NY

“We have used advanced controls and variable frequency drives to increase the efficiency of our HVAC system. The savings achieved in energy, operating costs and maintenance are tremendous. We have multiple opportunities at Niagara to expand this project. We already have the backbone in place with our building automation system, and we can use that to save a significant amount of energy at other chiller plants as well. We are looking forward to sharing the results of this project with colleagues at other sites as well as with our customers.”



JAMES ZEAMES
Senior Electrical Engineer
Niagara, NY

“As part of this project, we are installing a system of variable frequency drives on our HVAC system, which controls the climate at the Power Vista visitor center. We retrieve energy savings through the ability to cycle these drives at different rates according to need. This allows us to make more electricity available to our customers.”



HARRY FRANCOIS
Regional Manager
Western New York
Niagara, NY

“When we conserve energy, we can put more energy into the grid and into the market. In this way, we can increase our revenues, and with that we can help the community, the economy, and also small businesses. We can enhance the lives of a lot of people by doing the kinds of things we’re doing right now.”

Case Study

White Plains Office LED Lighting Retrofit

Upgrade existing lighting throughout interior office spaces and parking garage with high-efficiency LEDs to reduce the building's energy and carbon footprint.



Estimated to reduce WPO energy consumption by **9%**



Average annual reduction in energy use per floor **21,552 kWh**



46% reduction in electricity for lighting



Garage lighting: **78% reduction** in average daily kWh consumption



Projected annual reduction in energy use and costs building-wide **4 MWh**
\$78,407



GEORGE MARRIOTT
Facility Manager
White Plains, NY

“We’ve completed a number of standard lighting retrofits over time, but when we initially considered LEDs, installing all new fixtures increased the overall cost. To meet the goals of Executive Order 88, we selected a more cost-effective option – LED lamps that could be installed in existing fixtures using the same ballast. This reduced the cost of materials and labor, while producing significant energy savings.”



STEPHEN BOSCO
Facility Project Engineer
White Plains, NY

“The trick with many lighting projects is to maintain the quality of light but also reduce energy consumption. The selection process included extensive photometric testing to certify that we weren’t going to shortchange building occupants with a lower quality of light just to save energy and costs. Most occupants didn’t even realize that we had replaced fluorescents with LEDs, and we saved about half the energy for lighting in the building.”

QUICK FACT:

The White Plains Office LED lighting retrofit saves **683,037 kWh annually.**¹²

Spotlight: Plug Load Management Pilot

At our White Plains Office, we launched a pilot program to monitor and schedule plug-loads using Wi-Fi-connected sensors that plug into existing outlets. We installed more than 70 devices and connected them to a variety of appliances, including water coolers, shredders and scrolling monitors. Monitoring device-specific energy loads allows us to identify energy reduction opportunities and manage plug-loads more effectively. Since 2015, the project has reduced electricity consumption from plug loads by 40%, avoiding four tons of CO₂ emissions, which is equivalent to planting 103 trees.

Building Analytics



Through our partnership with New York Energy Manager (NYEM) and by leveraging NYEM's cutting edge energy management platform, we are able to accurately track and manage building energy performance. A combination of real-time interval metering and utility billing data allows us to closely monitor energy consumption and measure progress towards our targets. By integrating data from building-level meters and submeters, NYEM captures energy usage on a granular level, helping facility managers and engineers identify opportunities for efficiency gains.

New York Energy Manager, as well as other digital tools such the Sustainability Dashboard, Strategic Supply Management's software program, and our Sustainability employee engagement platform, are helping us make data-driven decisions that optimize resources and improve performance. By tracking and reporting results real-time, these platforms are also proving to be effective tools for influencing behavior and inspiring change.



Spotlight: Sustainability Dashboard

In partnership with Information Technology, we have developed a dashboard that aggregates energy and emissions data from our buildings and vehicle fleet, as well as solid waste data from our facilities. Through analytics and graphic displays, we are able to effectively manage performance and communicate results. As we move forward and expand our work, we plan to further develop this tool to manage performance in other areas.

 **QUICK FACT:**
During Daylight Hour, employees turned off lights for one hour in day-lit spaces.¹³ NYEM tracked energy reductions real-time. The White Plains Office lighting load went down 30%, saving 380 kWh of electricity and more than 600lbs of CO₂e.¹⁴



BRANDON HARDMAN
Sustainability Project Analyst
White Plains, NY

“Through digitization, we are able to make more impactful decisions, increase operational efficiency, and communicate sustainability performance effectively. Data analytics informs our strategy and drives continuous improvement, maximizing the value of sustainability to the organization”



JOSEPH O'CONNOR
Senior Project Specialist, NYEM
Albany, NY

“Interval data changes the way people are accustomed to thinking about their buildings and energy use. They can now watch how one small action, like fine tuning a piece of equipment or resetting the thermostat, can make an immediate impact. Seeing even small savings is exciting, and it encourages the end user to do more.”

Driving Performance



The transportation sector is the largest emitter of greenhouse gases in New York State and an obvious target for policymakers seeking to address climate change. As an electric utility, it is imperative for us to lead the way in electric vehicle (EV) adoption with our fleet and employees, and provide the infrastructure to support widespread EV use in New York State. As part of the ChargeNY program, NYPA is installing fast charge stations along the Thruway and standard Level 2 charging stations in public locations across the state. At our facilities, we are working with engineering teams to install charging stations for fleet, employee and visitor vehicles in all locations.

As part of our Carbon Footprint Program, NYPA has set a goal to reduce the energy and carbon intensity of our light-duty administrative fleet by 20% by 2020, and will replace 50% of the fleet vehicles with plug-in vehicles by that date in support of the State's Clean Fleets NY initiative. We are also using other options to meet our goal when plug-in vehicles are not feasible, such as hybrid vehicles and rightsizing – selecting more efficient vehicles that are the right size for the job.

Under our Workplace Charging Program, we are encouraging employees to commute in EVs by providing guaranteed access to charging during work hours. The program has expanded significantly this year with the arrival of new EV models on the market.

QUICK FACT:

NYPA's clean, affordable hydropower helps make New York State one of the leading regions in the U.S. for maximizing the economic and environmental benefits of EV adoption.¹⁵

ERIK WALTER
Technician and EV Owner
Niagara, NY

74%
Increase in NYS adoption rates in 2017



32
Different models of EVs and PHEVs



110 MPGe
Average mileage per gallon equivalent



50-70%
Less costly per mile to operate with minimal maintenance¹⁶



BRUCE SHOENER
Director, Fleet Operations
Marcy, NY

“We’re an electric utility, and we should be leading when it comes to electric vehicles. Whether it is full electric vehicles or plug-in hybrids, our goal should be to have the greenest fleet, and we should set the standard for others to follow. Partnering with Sustainability on the installation of electric vehicle infrastructure across NYPA sites is helping us take the next steps in the electrification of NYPA’s fleet and significantly reduce our carbon footprint.”



Spotlight:

Workplace Charging Program for Employee Vehicles

NYPA's Workplace Charging Program is an effective way to encourage employee adoption of EVs. Participants are given guaranteed access to charging while at work, which reduces range anxiety and allows them to reap the benefits of reduced operating and fuel costs. We have held several EV Ride & Drive events at our facilities and continue to provide opportunities for employees to experience new EV models firsthand.

In 2017, participation grew significantly, and there are now EV drivers across our facilities, from New York City to Massena, Niagara and Blenheim-Gilboa. As demand grows, NYPA is continuing to install charging stations at all sites.

Electrical engineers Richard Korenski, Mihaela Atanasiu, James Onesios and Raul Roldan work on EV infrastructure designs.



JOHN MARKOWITZ

Lead Energy Services
Product Development Engineer
and EV Owner
White Plains, NY

"Driving an electric vehicle is transformational. It changes your consciousness about energy and the environment. The car is constantly reporting back to you how efficiently you're driving, braking and accelerating, and as a result, you become more conscious of how energy is being used in your home or your workplace."



SHAUN PRENTICE

Electrical Supervisor
and EV Owner
Massena, NY

"We are in a rural location, and some people are traveling 30-40 miles one way to come to work. That's not uncommon up here. So the Workplace Charging Program is going to be popular. Some employees could use an EV without a doubt, and go back and forth to work without having to pay for all that gas."



JAMES BRIGHT

Energy Efficiency
Project Lead
and EV Owner
Albany, NY

Members of the workplace charging program at the White Plains Office.



Supply Chain and Waste Management



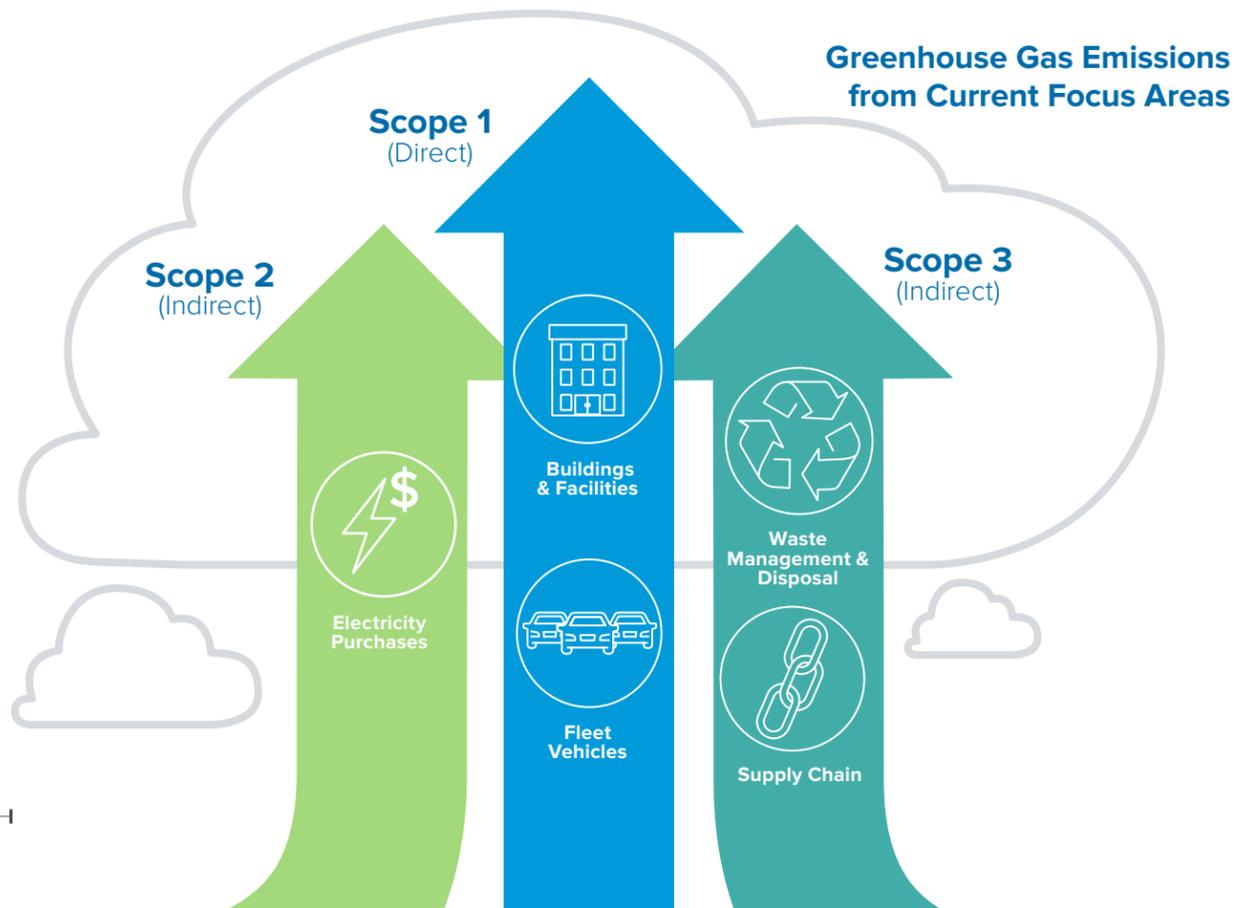
While the Carbon Footprint Program centers on sustainability within NYPA's operations, we also realize that our operations are part of a larger system. We are exploring upstream and downstream management of resources and are working to improve NYPA's environmental and social impacts throughout the value chain. From supplier practices to use of materials and disposal of products, we are taking a lifecycle approach to conserve resources, better manage our Scope 3 greenhouse gas emissions and spur product innovation.

Integrating Sustainability Into Supply Chain Operations



The Sustainability team is partnering with Strategic Supply Management (SSM) to embed sustainability principles into NYPA's procurement processes. Our goal is to leverage NYPA's purchasing power to drive the adoption of sustainable business practices by suppliers.

We are working with SSM staff to establish a supplier performance baseline, identify metrics and set targets for sustainable performance, and establish criteria for vendor and product selection. This process will be managed through SSM's digital platform, which will allow us to efficiently and effectively track performance using data analytics. As part of this effort, we will begin to assess our Scope 3 emissions from the supply chain and to develop a strategy for managing our larger environmental footprint.



JOHN CANALE
Vice President, Strategic Supply Management
White Plains, NY

“We have transitioned to an electronic bidding system and have instituted a cloud-based platform. This is an inherently more sustainable way of managing our purchasing process. The digital platform allows us to ask pertinent sustainability questions of our supply base to evaluate vendor performance. We want to know which suppliers we should continue to do business with, and more importantly, which ones we should not do business with based on sustainability performance.”



DIANE GIL
Senior Director Procurement Governance & Analytics
White Plains, NY

“Our goal is to provide actionable data for sustainable supply chain management. By benchmarking strategic suppliers, we will be able to better understand the maturity of their sustainability programs and provide feedback on their sustainability performance.”

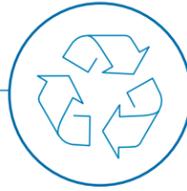


SHUVYA ARAKALI
Sustainability Project Analyst
White Plains, NY

“We are developing a strategy to integrate sustainability criteria into our purchasing and contracting decisions. This strategy can positively impact upstream practices, leading to larger, transformational changes in the supply chain over time. Ultimately, our goal is to create a more resilient, productive and secure supply chain.”

QUICK FACT:
Last year, we reduced our consumption of copy paper by 14,290 pounds, saving about 130,000 gallons of water from paper production.¹⁷

Waste Management—Continuous Improvement



NYPA conducted a waste audit in 2011 at all sites to establish a baseline for waste streams and disposal practices. The results of the audit informed several new employee engagement projects centered on behavior change. This year, we are working with environmental scientists at each facility to conduct another waste audit. Our goal is to identify additional opportunities to reduce waste generation and increase diversion rates. Improving the efficiency and accuracy with which we track and analyze waste data is critical to achieving our waste reduction goals, and our Sustainability Dashboard is proving to be an effective tool for data management and analysis.

JEFFREY PRZEPASNIAK
Planner, Instrumentation & Controls
Niagara, NY



JAMES JOHNSON
Real Time Systems
Engineer
Niagara, NY

Spotlight: Refuse Single-Use Challenge

This week-long challenge mobilizes employees to find alternatives to single-use disposable items, and to document their efforts with photos, journals or video logs. Participants share solutions, and many continue with these efforts at work and at home after the campaign is over.

Case Study

Zero Waste

Building new habits takes practice, so we have designated some internal meetings and events as “Zero Waste”, encouraging employees to bring their own reusable dishes and utensils to save resources. It's catching on, and it is helping us reach our goal to reduce office waste by 10% each year.



JESSICA ABRERA
Marketing & Energy
Forecasting Analyst
White Plains, NY

“I’ve been trying to encourage the adoption of zero-waste practices within my department because I’m passionate about sustainability, and I find that promoting these practices helps me build relationships with fellow employees and a sense of camaraderie.

When I first arrived in the group, I noticed that disposable items were the norm in the department, but a lot of things have changed since then, even extending beyond the department. Now, when we go to the farmer’s market together, we take our reusable bags. When we gather around the water cooler, we bring reusable coffee mugs and water bottles. When there is a NYPA event with food, we bring our own reusable plates, cutlery, and cups. Raising awareness and building relationships can definitely foster change. I hope that all groups and departments at NYPA incorporate sustainability into their work environments.”

QUICK FACT:

Executive Order 4 sets an annual 10% reduction target for office waste and requires the adoption of green product specifications for more than 50 different categories of products and services.¹⁸



PATRICK HOLDEN
Environmental Scientist
Niagara, NY

“Improving NYPA’s waste diversion rates is a complex task, with each site facing unique challenges. Our partnership with Sustainability ensures that a wide range of perspectives are utilized, and these initiatives are more successful as a result.”

Employee Engagement



Improving the sustainability of the organization is a collaborative process. Everyone has a role to play in helping NYPA achieve its goals. We have developed workplace programs and campaigns that support our targets and encourage collaboration across facilities. These initiatives are helping to foster a sense of shared purpose and create a platform for meaningful actions to be recognized and encouraged.

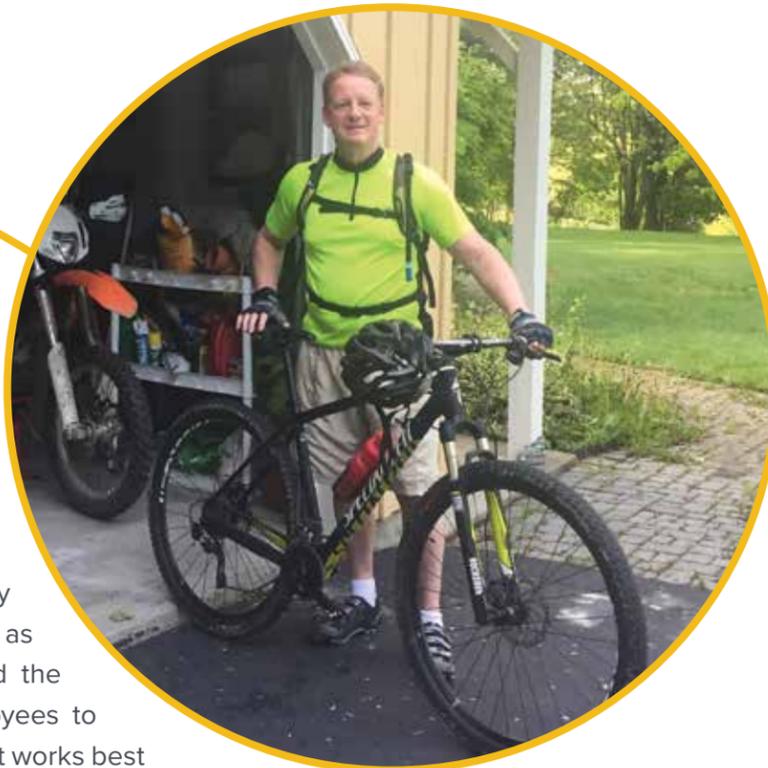


LIELLE BERMAN
Sustainability Project
Coordinator
White Plains, NY

“Everything we care about in our lives connects to sustainability, whether it’s family, health, human rights, food quality, or even our daily commute. The sustainability engagement program provides a forum for employees to inspire and learn from one another. Understanding how our individual actions and choices affect the big picture is key to ensuring prosperity over the long term.”

Spotlight: Green Commute Campaign

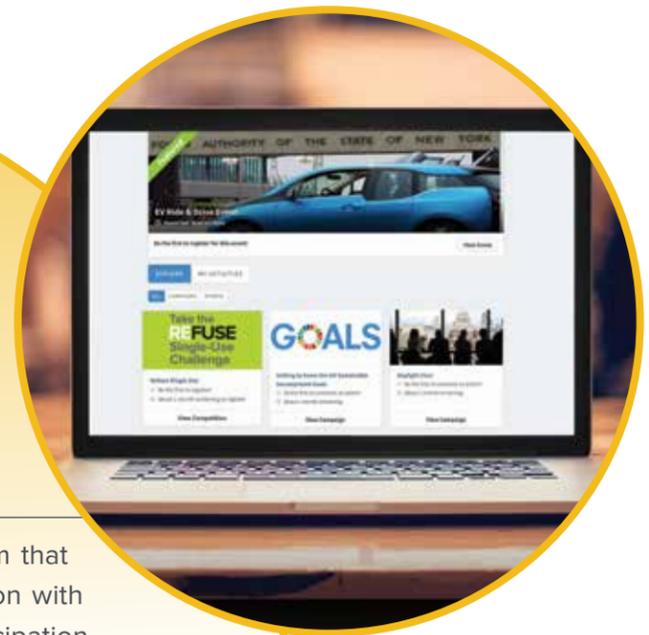
NYPA’s Green Commute Campaign challenges employees throughout the year to find alternatives to commuting in single-occupancy conventional gasoline vehicles. Events such as Green Your Commute Day, Car Free Day, and the Rideshare Social offer opportunities for employees to discover the mode of sustainable commuting that works best for them.



GLENN HAAKE
Special Counsel
Albany, NY

Spotlight: Employee Engagement Platform

NYPA has just launched an interactive software platform that combines dynamic content, social levers and gamification with incentives and rewards to encourage employee participation in sustainability initiatives and campaigns. This employee engagement tool will serve as a resource hub for connecting employees across sites and will facilitate knowledge sharing and collaboration. Data analytics embedded in the platform will allow us to measure the impact of specific campaigns and evaluate their effectiveness in helping us achieve our targets.



Employee Engagement—Workshops and Initiatives



Developing new perspectives is vital to maintaining our ability to make a positive impact. Presentations, workshops and other outreach events help to keep everyone in the company informed about our programs and the issues they address.

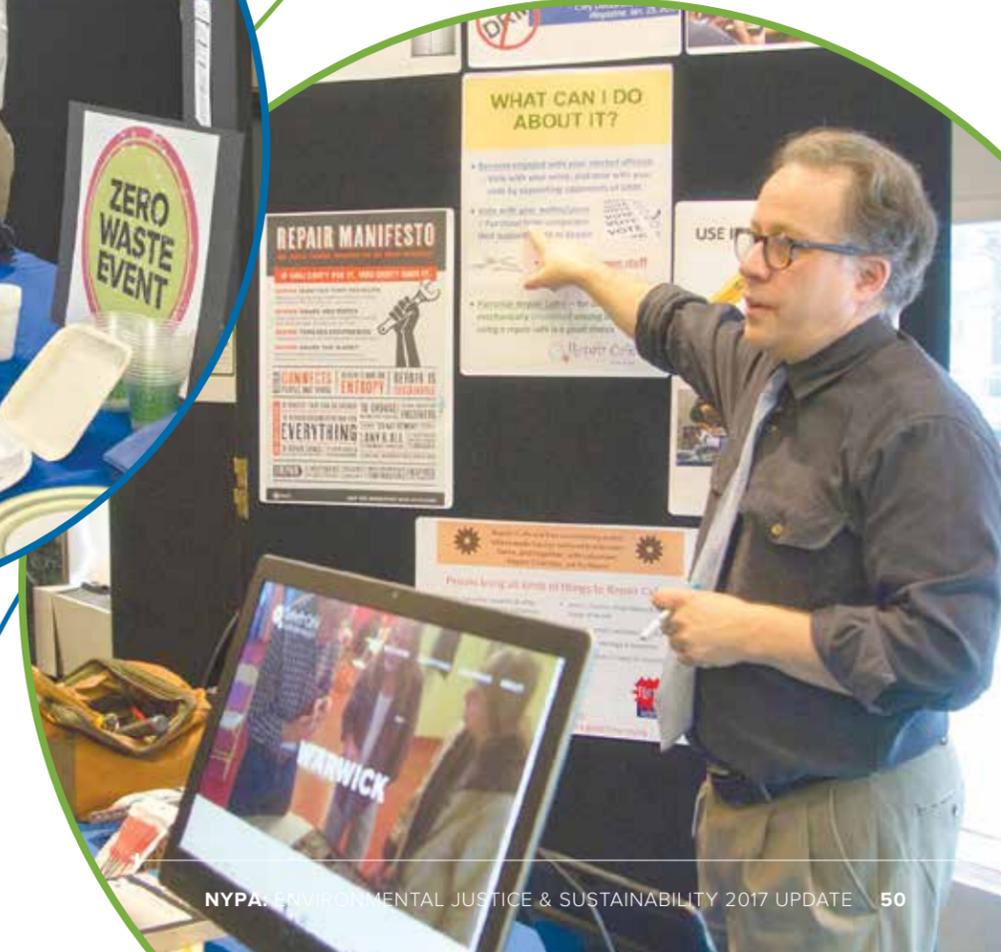
In 2017, the Sustainability team held “tailgates” at our facilities that provided an overview of our programs and highlighted opportunities to get involved. We also hosted a sustainability booth at each facility’s Family Day event, which included interactive games and activities for the family on topics such as waste, recycling, energy efficiency and electric vehicles.

Lunch & Learn events were held throughout the year. Recent topics include residential solar and NYPA’s solar program, energy efficiency in the home, electric vehicles and NYPA’s Carbon Footprint Program. Sustainability also sponsored expo-style events which are designed to take a deeper dive into various sustainability topics and encourage peer-to-peer education. These expos have explored a wide range of subjects, including climate change, food waste and agricultural systems, plastics and the life-cycle of consumer goods.



BEN WONG
Director, Metering
Queens, NY

“It is important that we monitor and cut down our energy consumption. I have three small kids. Every day I teach them how to save electricity, like turning off the lights when you leave the room. We have to save our earth, stop pollution and lower our energy consumption for the future, for the next generation.”



Looking Forward

In relaunching our Environmental Justice program and expanding the breadth and depth of our Sustainability program, our focus is not only on today but more importantly, on our future. The axiom, the future is now, has never been more true, and our planning for 2018 has already begun.

New York and the nation are at an energy policy crossroads, and we are playing a major role in the transformation of the energy ecosystem. NYPA is uniquely positioned to use its technical expertise in energy technology, digitization, renewable energy, and energy efficiency to provide New Yorkers with greater energy security, and a roadmap for how to live more sustainable lives.

Environmental Justice and Sustainability are fundamental to our mission, informing our operations, strategic planning, corporate culture and our programs with underserved communities. The Sustainability program is not only transforming NYPA as a utility, it is also changing employee behavior. Employees are making conscious choices to think and act sustainably in their professional and personal lives.

The Sustainability program is a natural bridge to an enhanced quality of life for our Environmental Justice communities. We are bringing best practices and lessons learned from this program into our Environmental Justice communities creating a win-win for NYPA, the environment and the people of the State of New York.

We will continue to build on our success in 2018. The development of a three-year implementation for each program is currently underway. Both plans will be enterprise-wide and have specific goals, targets and metrics that we will use to continually improve our efforts.

I am proud to say that NYPA's future in Environmental Justice and Sustainability looks bright. It is our goal to be a role model for corporate responsibility in the public and private sector. I look forward to sharing our plans with you next year.



JOHN R. KOELMEL
Chair, NYPA Board of Trustees



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