ADVISORY SERVICES  DESIGN-BUILD  RESILIENT SOLAR

Services of the New York Power Authority
WORKING WITH CUSTOMERS TO ACHIEVE THEIR ENERGY GOALS

The New York Power Authority’s (NYPA) diverse customer base includes public entities located in New York, including state agencies and authorities, universities, K-12 schools, and cities, towns and villages.

NYPA works with multiple customers implementing clean energy solutions through a structured and streamlined approach. As a public authority, NYPA is uniquely positioned to procure developers on behalf of customers. This, combined with streamlined processes, regulatory and technical expertise, and accessible financing options, provides the highest value to customers. NYPA is prepared and proactive in its efforts to lead New York into a clean and sustainable energy future.
NYPA is a renewable energy leader in the electric utility industry. For more than 30 years, NYPA has facilitated the development of clean energy programs for public sector customers across New York State.

Bolstered by a commitment to develop 125 megawatts (MW) of distributed energy by 2020, NYPA has a Clean Energy Services initiative to assist our customers with the full process of clean energy project development—from scoping, design and purchasing to execution, management and close-out.

The energy services are broken down into three key features:

- **Advisory Services**
- **Design-Build**
- **Resilient Solar**
Clean Energy Services

NYPA provides comprehensive services in a **phased approach**. The distributed energy team manages each project **from inception to completion and provides oversight** during every phase of the process. NYPA ensures the selected developer provides the **best value** for each customer.

NYPA’s Phased Approach

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<td>Request for Proposal (RFP)</td>
<td>Develop, Issue, Evaluate</td>
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<td>Project Management</td>
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Value to Customers

- Help achieve customer, state and local energy goals
- Ease project burden on customers
- Significant regulatory and technical expertise
- Streamline complex processes
  - Feasibility/site selection
  - RFP development & issuance
  - Developer selection & management
- In-depth understanding of solar industry
- Low upfront costs for capital-intensive projects

NYPA offers a broad range of clean and sustainable technologies that substantially benefit customers and support Gov. Andrew M. Cuomo’s Reforming the Energy Vision, which calls for a clean, more resilient, and affordable energy system for all New Yorkers.
Three Key Features

NYPA’s Clean Energy Services assist customers in the design and execution of renewable energy projects. This helps customers save money while achieving their clean energy goals.

1. **Advisory Services**
2. **Design-Build**
3. **Resilient Solar**

Benjamin Cuozzo and Christina Iwaniw, members of NYPA’s business development team, at the Hudson City School District event announcing the solar PV project at the Hudson Junior/Senior High School.
Advisory Services

NYPA acts as a trusted energy advisor for our customers by supplying the expertise and support needed to help implement clean energy projects. Advisory Services provides customers an integrated, streamlined and systematic approach from project inception to completion.

SUBJECT MATTER EXPERTS

NYPA’s Clean Energy Services initiative is comprised of in-house subject matter experts in engineering, financing, procurement and project management. They are dedicated to distributed energy technologies and New York policy requirements.

CUSTOMER OBJECTIVES

During the development phase, NYPA helps customers identify primary goals, and environmental and financial benefits.

PREQUALIFIED DEVELOPERS

NYPA works with clean energy developers to provide the best value to customers through an open solicitation process. We have prequalified developers throughout the state that specialize in many technologies and applications. This prequalified group allows for faster project timelines and developers best-suited for customer projects.
Advisory Services Process

**PROJECT DEVELOPMENT**

- **Site Selection**
  - Technical Analysis: Includes identifying potential interconnection locations and available capacity.
  - Environmental Analysis: Analysis completed of usable space including roof-tops, ground space such as parking lots, open fields and landfills.
  - Financial Analysis: Detailed review of financial aspects including utility bill analysis, value stream and New York State Policy.

- **Customer and NYPA**
  - NYPA Develops a project specific mini-bid and scope of work for the customer.
  - NYPA Procurement issues the solicitation on behalf of the customer.

- **NYPA Team**
  - NYPA Team completes a full evaluation of the responses and conducts developer interviews. NYPA provides a recommendation or vendor award.

- **NYPA**
  - NYPA provides recommendations and proposal to customer.

**DEVELOPER SELECTION**

- **Customer and NYPA**
  - execute an Authorization to Proceed.

- **NYPA**
  - Coordinates project kick-off meeting.

- **NYPA**
  - Leads weekly update meetings. NYPA provides developer oversight/management from award to completion and utility outreach, when needed.

- **Customer Contract**
  - Execution

- **NYPA Project Review**
  - of final design, interconnection incentives, project permitting and construction timeline.

NYPA CLEAN ENERGY SERVICES 5
Advisory Services Overview

NYPA will work with each customer to develop a customized project including cutting-edge technologies such as smart inverters and advanced energy storage solutions.

Clean Energy Services helps customers navigate scoping, design, procurement and implementation of their clean energy projects to maximize economic benefits.

What NYPA Does

- Streamlined program structure
- Solar policy and regulatory oversight
- Standardized contracts and preapproved developers
- Feasibility assessments and conceptual site designs
- Complete economic analysis of tariff rates and utility data
- Development of project scope of work
- Evaluation of proposals
- Specialized procurement administration process

Technologies

- Solar PV
- Wind
- Solar thermal
- Energy storage
- Renewables + storage
- Microgrids
- Load control
- Advanced demand response

Applications

- Resiliency projects
- Rooftop
- Parking canopy
- Elevated racking
- Ground-mounted system

New York State’s Office of General Services Highly Recommends NYPA for Solar Projects:

As an added customer benefit, the state’s Office of General Services, in partnership with NYPA, has issued a first-of-its-kind statewide contract to streamline processes and documents such as Power Purchase Agreements. The goal of the contract is to help accelerate clean energy adoption by agencies, authorities, cities, towns, villages and other public entities.
Case Study – Advisory Services

Hudson City School District

In May 2018, NYPA unveiled its largest-to-date solar array installation at Hudson Junior/Senior High School in Columbia County, enabling the district to lower its energy costs and carbon footprint.

Hudson City School District received advisory assistance from NYPA, including a request for proposal, site analysis, technical support, economic analysis, site surveys and project oversight. The district did not pay any upfront costs. The array will be owned, operated and maintained by the developer and the district will pay a fixed rate for the energy.

The school will be able to monitor the energy production in real-time through an online site that shows the kilowatt hours of energy produced each day, how much was consumed and the percent of energy offset by solar. The school recently began offering an alternative energy class in which it hopes to incorporate their solar array’s real-time data into the curriculum.

1.2 MW ground-mounted system (one of NYPA’s largest solar projects)

- 18-year Power Purchase Agreement
- 3,816 panels – over 5 acres
- Estimated to generate more than 1,519,000 kilowatt hours in year one
- Roughly $67,000 in cost savings per year
- 5,184 MMBtu in annual savings
- Will offset close to 950 tons of CO₂ emissions per year

Sangeeta Ranade, NYPA vice president, Clean Energy Business & Market Development, at the ribbon cutting held at the Hudson Junior/Senior High School for the solar PV project.
NYPA strives to expand the options available to its customers in innovative new renewable energy technologies, which also helps achieve New York’s clean energy goals. As part of these efforts, NYPA offers customers the Design-Build option. This gives public entities with specific capital budgets the opportunity to own their installations. NYPA’s streamlined process reduces barriers for customers and aids in the implementing of distributed energy projects.

NYPA conducted a public solicitation that pre-qualified various distributed energy developers.

There are more than two dozen developers that customers may use for distributed energy projects. Each project is mini-bid among developers who are qualified for specific technologies in all regions of New York.

Enhancing its commitment to develop 125 MW of distributed energy by 2020, this opportunity allows NYPA to provide customers with more flexible service delivery models and expedited implementation services to design, procure and install projects.
Design-Build provides many advantages rarely found in one source. This opportunity stems from NYPA’s history of implementing energy efficiency and distributed energy projects, and is strengthened by its drive to energize New York with low-cost sustainable power, innovative grid solutions and extensive energy services.

Through NYPA’s extensive industry experience and streamlined processes our customers have direct access to:

- Consistency
- Transparency
- Expediency
- Flexibility
- Affordability

24+ Pre-Qualified Developers

Multiple Technologies

- Solar PV
- Solar Thermal
- Wind
- Microgrid Control
- Energy Storage
- Load Control
Resilient Solar

NYPA recognizes the promising growth and potential for resilient solar applications in New York. Resilient Solar allows buildings and other infrastructure to operate even when the grid is down. Though the growth of solar installations has continued exponentially, resilient solar systems are still rare in New York despite the marked benefits. Solar systems are typically configured to shut down during grid interruptions. Resilient Solar functions and provides power during grid outages.

When solar is coupled with technology such as battery storage, it is typically designed to power critical loads and keep elements of the built environment operable during an outage or crisis.

For critical facilities—including hospitals, shelters and police stations, which must remain powered during an emergency for extended periods of time—diesel generators can be paired with solar and batteries to help fuel supplies last significantly longer. Resilient Solar can also function as both a standalone or grid-connected system, providing emergency power plus economic benefits.

NYPA is championing opportunities to improve cost effectiveness through advanced communications and controls that allow Resilient Solar to take advantage of all value streams available. Advanced inverter functions may allow Resilient Solar to capture additional revenue streams by including peak shaving, demand response and ancillary services.

Backup Power
Provides electricity to critical building infrastructure during grid outages

Additional Revenue Streams
Provides economic value

Grid Support
Delivers a variety of beneficial support services to the grid

Fossil Fuel Reduction
Reduces emissions harmful to our health and the environment
Resilient Solar allows buildings and other infrastructure to operate when the grid is down.
NYPA, the State University of New York at New Paltz (SUNY New Paltz), the New York State Energy Research & Development Authority, the Electric Power Research Institute and Central Hudson Gas & Electric have partnered to develop two demonstration projects on the SUNY New Paltz campus under an “integrated grid pilot” initiative. These projects will provide the research partners with an opportunity to study the impacts of Resilient Solar on the campus distribution system, assess the feasibility of a solar/battery microgrid, and evaluate the economic costs and benefits of the projects to learn more about the gaps between theory and practical implementation.

The first project consists of a 117 kilowatt (kW) solar array with smart inverters on the roof of the campus’ Sojourner Truth Library.

The second project is a microgrid comprising a 101 kW solar array connected to a 200 kilowatt hour (kWh) battery and 30 kW three-phase gas generator installed at the campus’ Elting Gymnasium. This microgrid project can power lighting, heating and hot water enabling the gymnasium to operate as a Red Cross emergency shelter during a grid outage. It can also receive signals from the electric utility, serving the campus, to provide ancillary grid services. The system will be one of the first solar + storage microgrid projects in New York to share grid value between the customer and the utility.

Through these projects, SUNY New Paltz will reduce its energy use intensity by 20 percent per Governor Cuomo’s Executive Order 88, which calls for improved energy efficiency in state-owned buildings.

**Savings**
- $25,000 annual utility cost savings from a combination of consumption, demand and capacity charge reductions
- Offsets 130 tons of greenhouse gas emissions per year
Statistics That Show Results

Since the early 1990s, NYPA has completed more than 150 individual renewable energy projects. NYPA’s Clean Energy Services initiative has assessed more than 1,000 project sites, which includes more than 400 individual customers.

Clean Energy Project Pipeline

NYPA’s Clean Energy Services initiative has more than 75 MW of solar PV (several with battery storage) in development.

Examples of NYPA’s clean energy customer projects include:

- New York State Office of Parks, Recreation & Historic Preservations
- City of New York Public Schools
- The State University of New York
- The City of New York
- Metropolitan Transportation Authority
- New York State Department of Corrections & Community Supervision
- Towns and municipalities

NYPA’s Clean Energy Services initiative works with traditional industry technologies and applications including rooftop, ground, carports, pole-mounted systems and canopy structures. Additionally, NYPA has worked with unique opportunities in places such as landfills and brownfields which can host a Community Distributed Generation project for a town or municipality.