# Advanced Technologies Working Group 2025 Annual Report

Respectfully submitted by the Joint Utilities of New York,

- Central Hudson Gas & Electric Corp. (Central Hudson)
- Consolidated Edison Company of New York, Inc. (Con Edison)
- Niagara Mohawk Power Corporation d/b/a National Grid (National Grid)
- New York State Electric & Gas Corporation (NYSEG)
- Orange & Rockland Utilities, Inc. (Orange & Rockland)
- Rochester Gas and Electric Corporation (RG&E)

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# 1 INTRODUCTION

## 1.1 Background

On January 20, 2022, the New York Public Service Commission (PSC or Commission) issued its Order on Power Grid Study Recommendations,[1] directing the Joint Utilities (JU) and New York Department of Public Service Staff to establish a working group to evaluate, test, and accelerate the deployment of advanced transmission and distribution (T&D) technologies. In response to the Order, the Advanced Technologies Working Group (ATWG)[2] was organized to serve in the designated capacity.

On January 19, 2024, the Commission issued an ATWG Procedures Order[3] directing the JU to implement modifications to the ATWG's processes designed to "enhance its transparency and improve information flow between technology innovators and utilities."[4] The Commission directed the ATWG to file by January 31 of each year beginning in 2025, an annual report summarizing its activities and a calendar of major ATWG activities scheduled for the following year. The Annual Report set forth herein provides the information required by the ATWG Procedures Order, including a summary of the ATWG's efforts over the past year and a program calendar of anticipated ATWG activities in 2026.

**Acknowledgments**

The JU developed this report in consultation with multiple organizations, including:

- New York Department of Public Service (NY DPS);
- New York Independent System Operator (NYISO);
- New York State Energy Research and Development Authority (NYSERDA),
- New York Power Authority (NYPA);
- Long Island Power Authority (LIPA); and
- Electric Power Research Institute (EPRI)

1. Cases 20-E-0197 et al., *Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act* (Transmission Planning Proceeding), Order on Power Grid Study Recommendations (issued January 20, 2022) (Order on Power Grid Study Recommendations).
2. ATWG membership includes representatives from New York's investor-owned utilities, power authorities, the New York ISO, NYSERDA, and the Department of Public Service, as specified in the ATWG's *Research and Development Plan for Advanced Transmission and Distribution Technologies*, Revised March 21, 2024, at. 4.
3. Transmission Planning Proceeding*, Order Establishing Procedures for the Advanced Transmission Technologies Working Group* (issued January 19, 2024) (ATWG Procedures Order).
4. *Id.,* p. 12.

## 1.2 ATWG Objectives

The ATWG works to help ensure that the T&D systems in New York can support achievement of the Climate Leadership and Community Protection Act (CLCPA)[5] goals through the following objectives:

- Close Alignment with the Coordinated Grid Planning Process (CGPP): Provide JU planners with the best available information to help them evaluate advanced technologies as potential solutions to grid needs.
- Streamlined Technology Assessment: Focus on mapping clearly defined grid challenges to the capabilities of emerging and underutilized technologies.
- Targeted Stakeholder Engagement**:** Facilitate an ongoing dialog between the JU and the technology development community in New York.

## 1.3 How We Work

The ATWG has representation from three sectors:

- New York State entities, including the NY DPS and NYSERDA
- Investor-owned utilities (i.e., JU)
- Power Authorities and Grid Operators (LIPA/PSEG Long Island, NYPA, and NYISO)

The ATWG representatives meet monthly and may hold additional meetings as needed. The ATWG hosts multiple stakeholder engagement sessions each year and meets with technology developers and vendors to discuss advanced technologies. The Program Calendar section of this Annual Report provides details on non-routine meetings and activities.

The ATWG creates subgroups as necessary to focus attention on various technology areas. The ATWG has established task forces for Dynamic Line Rating (DLR) technologies, energy storage for T&D applications, and Power Flow Control (PFC) technologies. The ATWG may elect to establish a task force to explore a specific type of barrier, technology, or research and development (R&D) question. Task forces set their meeting cadences, which have ranged from bi-weekly to monthly, or longer, depending on activities.

## 1.4 Grid-Enhancing Technologies

There continues to be strong and growing interest in grid-enhancing technologies (GETs) as utilities work to modernize the electric T&D system, address aging infrastructure, and accommodate increasing levels of renewable generation and electrification-driven load growth. Technologies commonly classified as GETs include DLR, advanced PFC, grid-forming inverters, and a range of

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5. Climate Leadership and Community Protection Act (CLCPA), *available at* https://www.nysenate.gov/legislation/bills/2019/s6599

grid monitoring, sensing, and analytical tools that can improve visibility into system conditions and optimize power flows on existing assets. When deployed independently or in combination with traditional T&D investments, GETs can increase the utilization of existing infrastructure, enhance system reliability and resilience, reduce congestion, and, in certain applications, defer or complement conventional capital upgrades needed to support clean energy objectives.

Utilities in the United States and internationally are increasingly moving beyond pilot-scale demonstrations toward more targeted deployments of GETs, generating valuable operational experience and data on performance, costs, and use cases. These efforts are helping to clarify where GETs can provide the greatest value and how they can be integrated into utility planning and operations. The ATWG's program areas remain aligned with supporting the evaluation and potential deployment of GETs in New York State. The ATWG will continue to track industry developments and lessons learned from other regions to inform discussions and support the broader consideration and utilization of GETs in New York.

## 1.5 Coordination with the CGPP

Supporting the CGPP is a core objective of the ATWG. In 2025, the ATWG developed a set of screening criteria to support JU planning engineers in evaluating select advanced technologies as potential solutions to grid needs identified through the CGPP. As part of its ongoing coordination with the CGPP, and as additional information and experience become available, the ATWG intends to further develop planning guides and screening criteria for other advanced technologies in support of New York State's clean energy and system planning objectives.

While the first CGPP cycle is expected to conclude in the first half of 2026, additional opportunities remain for the ATWG to support the CGPP in future planning cycles. One key area identified for potential support relates to the development of inputs for the capacity expansion models used in the initial stage of the CGPP, which informs the rest of the planning process. These models require a wide range of region-specific inputs reflecting grid topology, load characteristics, asset types, cost assumptions, and use cases, including those related to system reliability, renewable integration, and demand management. Developing and refining these inputs can be resource-intensive and may create practical constraints for CGPP planners. In this context, the ATWG may have a role to play in coordinating with the utilities and, where appropriate, their partners. The ATWG can help clarify modeling assumptions, constraints, and performance characteristics for certain advanced technologies—such as long-duration energy storage and dispatchable emissions-free resources (DEFRs)—to facilitate their consideration as additional options within the CGPP modeling framework.

# 2 PROGRAM AREAS

Consistent with the ATWG Procedures Order, the ATWG has made substantial progress in evaluating DLR, PFC, and energy storage technologies for T&D applications. In alignment with that Order, the ATWG has also broadened its scope to assess additional technologies, including advanced conductors and grid stability solutions. Table 1 summarizes a subset of initiatives that are currently underway, fall within the ATWG's scope, and are of sufficient scale or maturity to warrant reporting at this time. These efforts are led by the JU, NYISO, NYPA, and NYSERDA in partnership with the product-development community.

*Table 1. Projects Underway by Program Area*

| Dynamic Line Ratings | Energy Storage for T&D | Power Flow Control | Advanced Conductors | Grid Stability | Total |
|---|---|---|---|---|---|
| 5 | 11 | 4 | 5 | 11 | 36 |

Since the last Annual Report, the JU have advanced their understanding of DLR, PFC, and T&D energy storage on multiple fronts, most notably through the real performance data collected from existing pilots and demos, and in their efforts to identify opportunities to utilize the technologies as cost-effective solutions in the first cycle of the CGPP. The Screening Guide used for the first cycle of CGPP was primarily utilized in Stage 3 (Local Solution Development), as detailed further in Section 3.

The lessons learned from the first cycle of the CGPP will inform the ATWG's priorities moving forward. At the same time, additional work is necessary to thoroughly evaluate new technology areas – such as grid stability – before they can be fully considered as potential alternative solutions in the next cycle of the CGPP. With that in mind, the ATWG will proceed through its evaluation process to focus on prioritizing vetted and mature technologies that are ready for deployment.

## 2.1 Dynamic Line Ratings

### 2.1.1 Accomplishments to Date

Central Hudson, Con Edison, Orange & Rockland, National Grid, NYPA, and NYSEG/RG&E have active studies, pilots, or demos of DLR to evaluate its capabilities for integration into their respective energy management systems (EMS). Some utilities included DLR as a component to some of their local transmission solutions for consideration within the Stage 5 Capacity Expansion modeling in the first cycle of CGPP. The milestones and insights gained from these collective efforts will be leveraged to enhance future transmission operations.

*Central Hudson*

Central Hudson is conducting a pilot project to evaluate DLR technology on a 69 kV transmission line. This initiative involves the installation of sensors to measure conductor temperature and current, along with a weather station that tracks ambient conditions such as temperature, wind speed, solar radiation, and wind orientation. Using this data, Central Hudson calculates dynamic ratings to compare against traditional static and ambient-adjusted ratings. The project, which began with installation in December 2024, will run through December 2026, enabling Central Hudson to assess sensor accuracy and determine the potential benefits of DLR for its transmission system.

*Con Edison and Orange & Rockland*

Con Edison and Orange & Rockland are partnering with EPRI to evaluate how multiple DLR vendors perform on one of Con Edison's transmission lines. This evaluation was designed to also understand the conditions where differing Ambient Adjusted Ratings (AAR) and DLR technologies provide the best benefit (balance between accuracy, ampacity, complexity). This includes investigating the forecasting uncertainty in 3-day and 10-day forecasts of AAR and DLR. Con Edison has found that potential DLR vendors typically do not have a separate product for AAR, and that they utilize technology without the wind speed component of the DLR product for AAR. To comply with the Federal Energy Regulatory Commission (FERC's) Order No. 881, Con Edison will utilize their EMS which has integrated components, while continuing to evaluate the DLR vendors as an enhancement to AAR. Con Edison completed the first DLR installation in September 2025 for an Extra-High Voltage (EHV) feeder and will collect data through 2026. Based on each vendor's performance, Con Edison and Orange & Rockland will potentially recommend further deployments across their respective service territories.

*National Grid*

In August 2024, National Grid launched the largest U.S. deployment of DLR technology, installing LineVision's patented LineRate™ software and advanced sensor platform on four 115 kV transmission lines near Buffalo, New York. This milestone project builds upon a successful pilot and delivers real-time, condition-based ratings that may enable additional transmission capacity and improve grid resilience. Data from 2025 shows dynamic ratings exceeded traditional static limits approximately 0-15% of the time.

*NYPA*

NYPA R&D, Advanced Grid Innovation Laboratory for Energy (AGILe), WindSim Power, and Right Analytics collaborated on a project to assess the economic values of DLR operations in Northern New York. The project aimed to perform a comprehensive economic assessment of DLR operations on the transmission lines in the Moses-Plattsburgh corridor by conducting production cost simulations using GE MAPS. Two sets of simulations were run for this purpose: (i) a Base Case and (ii) a Project Case, to thoroughly investigate the potential economic benefits of implementing DLR in this region.

*NYSEG/RG&E*

NYSEG, in partnership with NYSERDA, launched a DLR pilot in January 2023 to evaluate technologies that can increase transmission capacity, reduce congestion, and support New York's clean energy goals. The project targeted four 230 kV transmission lines serving wind generation in the western part of New York due to their operational constraints. The LineVision deployment was completed in June 2023, installing light detection and ranging (LiDAR)-powered sensors on two lines to monitor line sag in real time. Initial results indicate an average 20% gain above seasonal ratings approximately 90% of the time, while the remaining 10% of DLR values fell below static ratings, providing a safety margin during adverse conditions. A second solution using WindSim technology planned to install Vaisala weather stations on additional 230 kV lines in the same area to feed computational fluid dynamics (CFD) based DLR calculations. However, WindSim ceased operations in early 2025 before any data could be collected. NYSEG intends to move the LineVision DLR solution into production in 2026, at which point twelve months of operational DLR data will be analyzed against both seasonal and AAR to quantify the incremental benefit of DLR over AAR and determine the cost-effectiveness of the additional capacity. This evaluation will inform broader adoption strategies while considering reliability, weather impacts, and vendor stability.

### 2.1.2 Challenges Identified

While there are encouraging signs of progress advancing DLR in New York, additional real-world data, engineering analysis, and scrutiny has uncovered challenges and limitations of the technology for long-term transmission planning, like the CGPP. The Joint Utilities emphasize that the challenges and limitations discussed herein should not be interpreted as insurmountable. Rather, they are a reflection of the typical solution development process which judges each alternative based on a variety of factors relevant to the project as they become available. The challenges and limitations can be categorized into:

- Potential shortcomings in the processes that could identify DLR as a solution
- Geographical applicability
- Resolving external dependencies
- The potential mismatch between use case and number of opportunities to deploy

*Item 1: Process Improvements*

DLR can be considered in Stage 3 of the CGPP as part of solution development, but future improvements to the process might consider how DLR can be further integrated into the capacity expansion modeling. In Cycle 2 of CGPP, the Joint Utilities will be including the Stage 1 Capacity Expansion Model with tranches of conceptual "headroom projects." There may be opportunities within this stage to incorporate DLR projects.

*Item 2: Geographical Applicability*

While the JU are making collective progress, some utilities have more DLR development than others due to the geography of each service territory. For example, National Grid and NYSEG/RG&E are the furthest along in DLR evaluation and deployments, as they have the greatest share of overhead transmission line miles with renewable generation, making their systems ideal candidates for DLR development at scale. Additionally, the ability of DLR to increase system capacity is highly dependent on the local geography and typical weather conditions surrounding the line (wind speed, wind direction, vegetation cover, valleys, etc.) While data suggests that DLR typically provides a net increase in capacity, there are instances where line ratings are decreased below the original static rating.

*Item 3: External Dependencies*

Uncertainty remains as to what sort of formal guidance FERC may issue on DLR following FERC Order No. 881 establishing AAR.  Studies may also be needed to determine the incremental benefit of DLR over AAR and to evaluate economic justification. Additionally, the necessary readiness to implement extends beyond the JU. NYISO is primarily focused on enabling AAR in compliance with FERC Order No. 881 and has requested an extension to implement AAR from the original deadline of July 2025 to December 2028. Any statewide deployments of DLR will need to be coordinated with future FERC orders and related efforts by NYISO. Ultimately, for deregulated markets like New York, the Independent System Operator (ISO) needs to be ready to operationalize its use and have an economic or regulatory mechanism for requesting additional transmission capacity from the local utility.

*Item 4: Lack of Opportunities to Deploy Aligned with Use Case*

DLR can only be applied as a planning solution under specific conditions. It is most effective when overloads are relatively modest – typically no more than 30%, and ideally less than 10% – and when feasibility evaluations confirm its value. Based on experience from deployments to date, DLR is particularly useful in scenarios where renewable generation grows faster than traditional transmission development, creating congestion and curtailment risks. DLR is highly line-specific and better suited for specific, actionable near-term operational challenges where traditional solutions are not yet available or not economically justified. Long-term expansion planning typically addresses severe overloads (+100%) over a 10–15-year horizon. In these cases, lines must be rebuilt due to large overloads, and they are generally sized with sufficient margin, reducing the need for DLR in the long term. While opportunities for DLR in long-term planning are limited, it may provide meaningful benefits in select situations where projected overloads are modest and increasing system capacity for future renewable generation is possible. The Joint Utilities plan to deploy DLR in long-term planning when these criteria are met and will continue to use DLR to relieve near-term needs as applicable.

### 2.1.3 Recommended Next Steps

- The JU will continue preparing their respective EMS to implement AAR once NYISO operationalizes AAR in compliance with FERC Order No. 881. Implementation of AAR will enable certain benefits like those provided by DLR, while also advancing the operational capabilities needed to support future DLR deployment.
- The JU will simultaneously continue to evaluate different vendors and approaches to implementing DLR. This will enable the JU to be ready to deploy DLR should generation capacity additions begin to outpace the transmission system build-out.
- The JU will incorporate a more robust screening criteria developed in collaboration with Siemens and NYSERDA through an ongoing potential study, as well as lessons learned from the in-flight pilots and demos, to identify additional opportunities in Cycle 2 of CGPP.

## 2.2 Energy Storage for Transmission and Distribution

### 2.2.1 Accomplishments to Date

Central Hudson, Con Edison, National Grid, NYSEG/RG&E, NYSERDA, and Orange & Rockland have active studies, pilots, or demos related to energy storage for T&D applications to evaluate its capabilities. The milestones and insights gained from these collective efforts will be leveraged to enhance future transmission operations.

*Central Hudson*

Together with NYSERDA, NYPA's AGILe, and EPRI, Central Hudson is completing an analysis of energy storage use cases in the Westerlo Loop area in the northern portion of the territory. This region has seen high penetration of distributed energy resources (DER), leading to increased interest in energy storage solutions to alleviate system constraints. The project aims to explore how the location and size of energy storage can impact the ability to accommodate more exporting generation. By analyzing the performance of proposed energy storage solutions within a transmission and distribution setup, the study seeks to provide Central Hudson with a comprehensive understanding of the technical and economic feasibility of energy storage for resolving current and future constraints.

*Con Edison*

Con Edison, in partnership with EPRI, is advancing fire prevention and mitigation strategies for battery energy storage systems (BESS) to better guide stakeholders and communities in responding to potential system failures. Beginning in early 2025 and continuing through early 2027, the initiative focuses on understanding how failures driven by short circuits, overcharging, overheating, or mechanical stress can lead to fires, explosions, and harmful emissions. The project aims to assess associated public health and environmental risks, clarify the scientific understanding of chemical emission behavior during BESS events, and identify suitable modeling tools for predicting plume dispersion in dense urban settings. These findings have already informed improvements to

Con Edison's design standards, emergency procedures, and overall safety practices and will continue to do so.

Also, beginning in late 2025, Con Edison commenced a "Battery Energy Storage and Grid Forming Inverter based Microgrids for Resiliency" project - another collaboration between Con Edison and EPRI. The project is designed to analyze and demonstrate the feasibility of utility-designed and operated microgrids in Con Edison's service territory leveraging grid-forming inverter technology. The project's objectives include:

- Improving reliability and resiliency of electric supply during major weather events and service interruptions.
- Enabling strategic islanding of microgrids to protect the grid and maintain service for customers.
- Conducting detailed analysis of power quality, stability, and protection to ensure safe and effective microgrid operation.
- Leveraging Distributed Energy Resource Management Systems (DERMS) and Advanced Metering Infrastructure (AMI) systems for coordinated microgrid control and load shedding.

This project provides new learning by demonstrating an end-to-end analysis process, identifying gaps in implementation, and developing strategies for future deployments. The project's tasks include data collection, feasibility and viability analysis, model development, steady-state and transient analysis, protection strategy, grounding evaluation, and power quality assessment. The findings will inform best practices for integrating utility-owned microgrids into the broader grid for enhanced resiliency.

*National Grid*

In 2018, National Grid commissioned and interconnected the East Pulaski Energy Storage System (ESS) to relieve local thermal constraints. This project began bidding into the NYISO Energy Storage Resource Market in March 2024, and in September 2025 tested the appropriate communications with the NYISO to enter the ESS into the Regulation market.

National Grid is currently in the process of developing three locations for mobile battery energy storage projects. These projects were approved as part of a list of urgent upgrade projects in the Commission's Proactive Planning Proceeding.[6] The projects provide a bridge-to-wires alternative to faster support transport electrification load growth, alleviate constraints, and serve as a long-term resilience option that provides interim solutions as well as alleviating immediate constraints while a long-term substation solution is developed. National Grid issued a Request for Proposal (RFP) in December 2025 and expects to further engage mobile battery storage vendors in the first half of 2026.

6. Case 24-E-0364, *In the Matter of Proactive Planning for Upgraded Electric Grid Infrastructure* (Proactive Planning Proceeding).

*NYSEG / RG&E*

NYSEG is in the early project development stage of installing two BESS systems at company-owned locations at the Stephentown and Wales Center substations. These projects will provide load relief to the substation transformers through peak shaving as well as secondary benefits such as increased hosting capacity and the potential to provide a microgrid to back up feeders.

NYSEG is also in the conceptual stage of evaluating a 10 MWh (1 MW / 10 hours) Long Duration Energy Storage (LDES) system. This initiative would allow NYSEG to test alternative energy storage technology (i.e., non-lithium-ion) capable of addressing system needs where peak-shaving and microgrids can improve reliability when longer storage durations are required.

NYSEG and RG&E are in the early conceptual stages of evaluating Mobile Battery Energy Storage System (MBESS) use cases and applications. The study focuses on using MBESS to provide a flexible, temporary solution to address near-term capacity constraints and support reliability while permanent infrastructure upgrades, that often take three to seven years, are completed.

*NYSERDA*

NYSERDA issued a series of challenges through 2024 that have been defined in collaboration with the JU and NYSERDA internal teams. Each round presented an opportunity to improve performance and validate value propositions for the electric power delivery system as it evolves with increasing renewable penetration. The projects also help establish a pathway for products and services to gain market entry by addressing existing technical and economic barriers. The NYSERDA Program Opportunity Notice (PON) 4393 focused on product development and demonstration projects defined by National Grid and Con Edison that improve the resiliency, reliability and overall performance of the power grid in support of achieving New York States goals from the CLCPA. In 2025, Con Edison, in collaboration with NYSERDA, kicked off two projects that were awarded under PON 4393.

The first, ‘DC-CONNECT: Direct Current Control of Next-geN Energy Conversion Technologies’, aims to address the challenges of integrating DERs into Con Edison’s grid by deploying an advanced utility controller solution that facilitates dynamic load capacity management, reliable operation during contingencies, and seamless communication between utility and customer controllers. This project is supported by Con Edison, NYSERDA, NineDot Energy, and SMPNET. The utility controller can optimize power routing across multiple feeders, enhance voltage regulation, and ensure coordination with upstream grid components, with emphasis on enabling Con Edison to increase DER hosting capacity, mitigate feeder overloads, and enhance overall grid resilience.

The project may involve the implementation of additional substation-level computing hardware and BESS, paired with Omega Suite for millisecond-level dispatch and optimization of power flows. By facilitating seamless communication between inverters, energy storage, and Con Edison’s Supervisory Control and Data Acquisition (SCADA) systems, the solution improves grid stability and reduces the physical and regulatory footprint.

The second project is the “Utility Controller for Multi-Terminal DC-Tied Interconnections”. Here, Con Edison is testing a Utility Controller for a DC-Tied Energy Storage System. This project is supported by Con Edison, NYSERDA, S&C Electric, and EPRI. The utility controller will simultaneously monitor and command multiple inverters to provide dynamic control of the feeders connected to the inverters, including power sharing between feeders, volt-var management, and increasing overall grid resiliency.

The GridMaster® microgrid control system being tested in this project from S&C Electric is a commercial product used extensively in military and utility microgrids for asset management, energy reliability, and contingency handling. It supports the Distributed Network Protocol 3 (DNP3) communication protocol and allows for intuitive custom programming. Use of a stand-alone Utility Controller solution that is not tied to a particular inverter or battery manufacturer gives Con Edison flexibility in future deployments of similar systems since the basic functionality can be easily replicated.

*Orange & Rockland*

Orange and Rockland has achieved full enrollment in its REV Demonstration ISBM Virtual Power Plant (VPP) project. It was dispatched during the summer 2025 season (May - August) with 345 residential customers enrolled with solar-plus-storage systems installed with permission to operate. During 39 dispatch events in summer 2025, a total of 49.5 MW / 99 MWh were delivered by the solar-plus-storage systems. Each event averaged 1.3 MW / 2.6 MWh. This data was recorded in a performance dashboard. Orange & Rockland filed the finalized project implementation plan in 2020 and completed all customer acquisition and testing activities in Q1 2025 (as COVID-19 and associated battery supply chain issues had caused delays). Based on DPS Staff’s agreement that it would be beneficial for the three-year demonstration period to begin after full enrollment and testing had been completed, the demonstration period was changed to 2021-2023 to 2025-2027. This project will ultimately help demonstrate the potential for energy storage, when paired with solar, to be aggregated into a VPP.

Orange & Rockland is in the planning stage of installing a 1 MWh (100 kW/10 hours) LDES system at a company-owned location in Port Jervis, New York. The LDES will be third-party owned and operated, supplying Orange & Rockland’s environmental remediation equipment located on-site. Orange & Rockland was designated as a sub-recipient of a Department of Energy (DOE) grant for this project at a location where LDES can help demonstrate the continuous operation of critical equipment from stored solar PV energy. This project is also intended to demonstrate how non-lithium-based storage works in the field. The LDES technology is a carbon-based aqueous supercapacitor. The potential benefits are that it can significantly lower fire risk in the materials themselves, while the materials are also sourced in an environmentally friendly way and are significantly less expensive than lithium-ion battery raw materials. For these reasons, this technology is uniquely positioned to deliver energy well beyond the 4-6 hours range that lithium-ion storage is best suited for from a financial standpoint. The project team is preparing permitting documents and is working with local elected officials to get the system installed and operational.

### 2.2.2 Challenges Identified

*Item 1: Community Engagement*

As with any project, ultimately, the success of an energy storage project depends on the level of acceptance of the host community. New York State, and NYSERDA specifically, has prioritized education and engagement with communities evaluating energy storage. This practice is encouraging and can be built upon by the JU as they advance opportunities for energy storage. Part of the challenge stems from concerns with fire safety, which is why some utilities are putting emphasis on this aspect of battery storage deployments or evaluating non-lithium-based battery chemistries to help alleviate those concerns.

Energy storage asset management requires coordinated activities to realize value from deployment. Since National Grid supports over 75 MWh of storage capacity in New York, it is actively investigating how energy storage health management can play a greater role in energy system optimization, including how energy storage systems (ESS) can support operational flexibility, enhance integration of renewable distributed generation, and reduce customer costs and constraints, while enhancing safety and reliability. Battery data analytics tools can quantify the impacts of operational choices and ESS usage on asset health and performance. The same battery science-informed analytics tools, when deployed in a SOC 2 compliant on-premises software package, can also provide accurate forward-looking power and energy estimates in real-time to support reliable operation of ESS assets.[7]

*Item 2: Regulatory Landscape*

Utility ownership of energy storage has demonstrated benefits and continues to be a tool available to the JU for specific cases approved by the Commission. As outlined in the section above (section 2.2.1), multiple utilities have approved energy storage applications throughout the state. Continued regulatory support through the state energy storage proceeding will help support the JU’s ability to plan, site, and deploy storage as a grid resource within traditional T&D planning frameworks.

Currently, the Commission is evaluating the JU 2024 study of non-market T&D energy storage which outlines a proposed framework, use cases and planning criteria for T&D-oriented storage deployments.[8] With approval, guidance, and support from the Commission, the JU may have an opportunity to advance additional beneficial storage projects.

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7. SOC 2, or System and Organization Controls 2, is a framework developed by the American Institute of Certified Public Accountants (AICPA) that ensures organizations manage data securely.
8. *See* Case 18-E-0130, *In the Matter of Energy Storage Deployment,* Joint Utilities’ Study of Non-Market Transmission and Distribution Energy Storage Use Cases and Related Process Proposals (filed October 29, 2024).

### 2.2.3 Recommended Next Steps

- Coordinate with NYSERDA and host communities to support education and engagement when evaluating energy storage.
- Continue to implement and prioritize the principles of New York State's fire code related to energy storage, including monitoring asset health management by collecting BESS information. Collect on-premises data to monitor asset health and performance.
- Continue to partner and deploy on-premises software solutions to provide real-time insights into the ESS asset's energy availability.
- Continue to collect performance data from energy storage demonstration projects used for VPPs or LDES to inform future deployments.

## 2.3 Power Flow Control Technologies

### 2.3.1 Accomplishments to Date

Central Hudson, National Grid, NYSEG/RG&E, and NYPA have active studies, pilots, or demonstration projects related to PFC to evaluate its capabilities. The milestones and insights gained from these collective efforts will be leveraged to enhance future transmission operations.

*Central Hudson*

Following an initial pilot project deployed in 2019, in 2024 Central Hudson moved forward with a large-scale installation of fifteen modular Static Synchronous Series Compensators (SmartValves) on the 345 kV Leeds-Hurley Avenue circuit. This project allows Central Hudson to control power flows in real-time by pulling power onto the Leeds-Hurley Avenue circuit and ultimately unlocking 185 MW of transfer capacity. The solution can also provide dynamic services such as improved voltage stability and transient stability, and can be scaled up with additional SmartValves in the future if the need arises. Central Hudson continues to collaborate with the provider, Smart Wires, to refine operational and maintenance protocols and procedures.

*National Grid*

Completing their evaluation, National Grid has begun a program deployment of Switched Source's Phase Equalizer (Phase-EQ) units, as part of the National Grid 2025 rate plan.[9] The program will look to deploy the Phase-EQ units broadly across the service territory on circuits with load imbalances and high neutral current. National Grid continues to assist its New England affiliates in monitoring and evaluating their first unit after a successful December commissioning in Massachusetts.

9. Cases 24-E-0322 et al., *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service*, Order Adopting Terms of Joint Proposal and Establishing Rate Plans (issued August 14, 2025).

*NYSEG/RG&E*

NYSEG transmission lines in Steuben and Allegany Counties face potential overload risks under certain contingency conditions and high wind generation scenarios. To address this constraint, a SmartValve will be installed on the NYSEG-owned section of the line. This technology was selected for its ability to prevent overloads by dynamically adjusting line impedance and thus redirecting power flow off overloaded lines and onto underutilized ones. The SmartValve unlocks additional network capacity and enhances system flexibility. Project development began in Fall 2023 and has successfully completed conceptual engineering and environmental studies to support detailed design. Both detailed design and SmartValve procurement are scheduled throughout 2026 and into 2027, with construction tentatively planned to begin in Q1 2028.

*NYPA*

NYPA, EPRI, Hydro Quebec, and Vermont Electric Power Company (VELCO) are currently collaborating on a project to address interregional congestion, grid flexibility, and the economic and environmental impact of power flow constraints across regions. The project aims to identify constraints limiting power flow, evaluate GETs for improved transmission capacity, and reduce curtailment while enhancing cost savings. The approach involves using the Power System Optimizer (PSO) for simulation and modeling to conduct scenario analysis. Additionally, the project includes assessing technologies such as APFC, DLR, and advanced conductors for congestion relief. A data-driven analysis is also being conducted to study production cost savings and improvements in system reliability.

### 2.3.2 Challenges Identified

PFC technology demonstrates significant potential to improve power flow efficiency and reduce renewable curtailment, but several challenges remain.

*Item 1: Selecting Deployment Location*

Optimal selection and placement of PFCs are difficult to determine due to system complexity and region-specific impacts. This becomes more evident when PFC is intended to control the flow close to the tie lines between two neighboring regions.

*Item 2: Uncertainty Regarding Benefits*

Uncertainty regarding the ultimate outcomes complicates investment decisions, as deployment costs and resolution of any hardware or operational issues must be balanced against production cost savings, reliability improvements, and environmental benefits.

*Item 3: Analytical Challenges*

High modeling and data requirements introduce analytical challenges, requiring detailed simulations and scenario analyses to accurately quantify system-wide impacts.

*Item 4: Limited Choice of Vendors*

There are a limited number of vendors that offer this technology within the required timeframe and which meet the specific requirements of certain utility projects.

### 2.3.3 Recommended Next Steps

- Refine siting and control strategies for PFCs using advanced power system simulations to assess system interactions, operational limits, and coordination with existing transmission assets.
- Evaluate operational integration and control impacts of PFCs including impacts on protection schemes, dispatch practices, and interregional power transfers under a range of operating scenarios.
- Quantify long-term economic and reliability benefits of PFC deployment through production cost modeling and reliability assessments to support broader adoption and regulatory approval.
- Prioritize pilot and scaled deployments of PFCs at congestion points identified in prior network studies to validate real-world performance and renewables curtailment reduction benefits.
- Continue to refine Operational and Maintenance protocols related to this technology. This includes correcting any component issues that arise as well as developing long-term predictive maintenance protocols.

## 2.4 Advanced Conductors

### 2.4.1 Accomplishments to Date

Central Hudson and National Grid have active studies, pilots, or demos related to advanced conductors to evaluate their capabilities. The milestones and insights gained from these collective efforts will be leveraged to enhance future transmission operations.

*Central Hudson*

Central Hudson has shifted from using aluminum conductor steel-reinforced (ACSR) to aluminum conductor steel supported (ACSS) conductors as the standard solution for future rebuilds and new transmission lines. ACSS conductor can be operated at a higher operating temperature, therefore increasing capacity rating of the line at a lower cost compared to ACSR.

*National Grid*

In 2006, National Grid energized a 350-meter, 34.5 kV high temperature superconducting (HTS) cable system between its Riverside and Menands substations in Albany, New York. This project marked the first in-grid application of “second generation” HTS wire, featuring new materials designed for improved cost-effectiveness and performance. The installation also achieved the first-ever HTS cable splice and integrated three-phase terminations within a utility grid. The Albany cable system was designed to carry 800 amperes at 34.5 kV, demonstrating the potential for HTS technology to enhance grid efficiency and reliability.

National Grid has standardized the use of ACSS conductors for all new line construction and full line rebuilds. ACSS offers increased capacity at a lower cost compared to traditional conductor types. Recently, National Grid completed a nine-mile new line construction project in Northern New York utilizing ACSS conductor. Over the next five years, National Grid plans to install hundreds more miles of ACSS.

National Grid is continuing to work with VEIR to design and deploy superconducting transmission lines in Amsterdam, New York. As part of a NYSERDA grant, VEIR will be looking to complete a technical study and demonstrate their proposed technology on an un-energized pilot at a decommissioned substation, including liquid nitrogen delivery systems, nitrogen-cooled conductors, and evaporative cooling units before expanding into the electric T&D system. Recently, VEIR has changed their technology from an overhead- to underground-based solution due to line cooling. Engineering and design work continues on the line in Amsterdam as of 2026. Lessons learned so far relate to the volume of nitrogen required for both overhead- and underground-based solutions. As of 2026, a NYSERDA GETS PON letter of support has been provided for a potential energized pilot following the Amsterdam demonstration.

In addition, National Grid is piloting a carbon-core advanced conductor from TS Conductor for sub-transmission rebuilds that require additional capacity.

### 2.4.2 Challenges Identified

*Item 1: Maintaining Standards*

Utilities must identify a limited set of standard conductor sizes that can meet long-term system needs while reducing the diversity of hardware that must be stocked, while simultaneously integrating new design and construction standards—such as those specific to ACSS—into existing engineering, procurement, and construction practices.

### 2.4.3 Recommended Next Steps

- Develop a list of conductors that will meet the JU’s physical and electrical design requirements.
- Develop new standards related to ACSS design, installation, and operation that ensure successful deployment of the conductor on overhead line projects.
- Evaluate lessons learned from constructing and executing the demonstration projects.

# 2.5 Grid Stability

## 2.5.1 Accomplishments to Date

Con Edison, National Grid, NYPA, NYSERDA, and multiple other utilities have active studies, pilots, or demos related to grid stability technologies to evaluate their capabilities. The milestones and insights gained from these collective efforts will be leveraged to enhance future transmission operations.

*Con Edison*

Con Edison is conducting a one-year collaborative study with EPRI titled "Grid Forming Inverter and Energy Storage–Based Microgrids for Resiliency," running from January 2026 to January 2027, to evaluate the feasibility and viability of utility-designed and utility-operated microgrids within its service territory. The project focuses on integrating battery energy storage and grid-forming inverter technologies to enhance system resiliency, with success metrics including the identification and verification of at least one feasible microgrid configuration, quantifiable improvements in reliability and resiliency (such as reduced outage duration and improved load-coverage probability), alignment of microgrid operations with DERMS/AMI processes, and delivery of actionable recommendations and validated models for future deployments. If successful, the findings will be incorporated into Con Edison's planning and operational procedures, inform future microgrid installations, and be shared—where non-proprietary—with the broader industry through EPRI programs.

*National Grid*

In 2017, National Grid worked with Utilidata to deploy AdaptiVolt, a Volt/VAR Optimization (VVO) technology, in Clifton Park, New York. By reducing the voltage on the distribution circuit, VVO technology can reduce customer electricity demand. The National Grid project was designed to reduce demand by up to 3%.

In January 2025, National Grid completed a NYSERDA PON 4393: JU Challenge VVO-Smart Inverter project.  This project identified the impact and potential benefits of integrating VVO with Smart Inverters. The project concluded that independent smart inverter volt/var controls are harmonious with primary voltage Volt VAR Optimization schemes and this harmony can be achieved without requiring any integrated VVO – Inverter controls.[10]

National Grid continues to evaluate LiDAR to produce high-resolution 3D models that capture the real-world locations, dimensions, and shapes of trees, wires, poles, structures, buildings, and terrain, including their spatial relationships and clearances. LiDAR is an active laser profiling

10. *See* Matter 10-00779, *In the Matter of Electric Research & Development Plans for all Electric Companies*, Niagara Mohawk Power Corporation Electric Research and Development Plan for the Period January 2024 through December 2028 (filed March 19, 2025).

technique widely used along transmission rights-of-way for line inspection, vegetation management, and corridor mapping. While remote sensing and mapping have been used in the utility sector since the 1990s, recent advances have improved LiDAR accuracy, lowered costs, and strengthened integration with geographic information systems (GIS). Historically, National Grid has deployed LiDAR sensors from helicopters and is now exploring fixed-wing aircraft to test use cases such as vegetation management, GIS data capture, and engineering and design. To advance these capabilities, National Grid submitted a proposal to NYSERDA PON 5848 to demonstrate this grid-enhancing technology in collaboration with a technical partner.

*NYPA*

National Grid and NYPA partnered again with Quanta Technology to advance their study of the New York power system by utilizing electromagnetic transient (EMT) simulation at NYPA’s Advanced Grid Innovation Laboratory for Energy (AGILe). This new project aims to model a section of the National Grid service territory with high penetrations of inverter-based resources (IBRs) and examine their effects on grid stability and protection. Key developments include converting grid models into Power Systems Computer Aided Design (PSCAD) simulation software via automated scripts, performing conversion validation, and investigating the implementation and testing of protective relaying functions including traveling wave protection. The EMT model, now in its final stages, will enable the team to evaluate and enhance protective relaying techniques to address the challenges posed by IBRs on the New York power system.

NYPA, NYISO, NYSERDA, iZY Solutions, and Right Analytics are collaborating on a project to address the integration of IBRs such as wind and solar into the grid, which is essential for achieving state sustainability goals but can also increase grid vulnerability to disturbances. To identify specific risks related to IBR stability and system integration, impedance-scanning methods are considered effective. However, NYISO requires a custom-made tool for their studies, as existing tools do not meet their specific needs. The project approach involves developing and implementing an impedance-based scanning tool, along with methodologies and guidelines, to help operators understand and evaluate the impact of integrating IBRs on power system stability. The work will include (1) the development of methodologies and guidelines, (2) the creation of a scanning tool compatible with PSCAD, and (3) a use case demonstration of the tool and guidelines for NYISO.

NYPA, Clarkson University, NYSERDA, and Intelligent NRG Solutions LLC are collaborating on a project to address New York State's CLCPA target of developing 9 GW of offshore wind (OSW) by 2035. This project focuses on investigating the potential operating challenges of a meshed High Voltage Direct Current (HVDC) system during faults and Temporary Overvoltages (TOV). The approach involves developing a modeling solution for the proposed meshed HVDC system specific to New York State. The collaborators will determine the stability of both the onshore power system and the meshed offshore wind power system under various grid conditions. Additionally, they will examine the protection impacts within the meshed network while ensuring compliance with NERC standards.

NYPA, Binghamton University, and NYSERDA are collaborating on a project to support New York State's transition from a synchronous generator-dominated grid to a mix of synchronous generators (SGs) and inverters as the state achieves its CLCPA goals. The focus of this project is to develop a comprehensive library of IBR plants and transmission grid models representing the New York State grid as it will be in 2035, for system planning purposes. The approach begins with building a set of validated IBR plant models in PSS/e and Julia. Subsequently, IEEE and New York State grid models with varying levels of IBR penetration will be prepared in both PSS/e and Julia. Contingency cases with different power flow conditions will then be run, followed by a transient stability analysis based on results from selected contingency cases.

Clarkson University and NYPA collaborated on a project to address New York State's CLCPA target of developing 9 GW of offshore wind by 2035. The project focused on potential operating challenges related to fault performance, temporary over-voltages, system protection, and power quality issues. The approach involved developing real-time models and conducting studies on the performance of offshore wind farms and their interactions with each other and the New York State grid. Additionally, electromagnetic transient wind farm models were created and interconnected with the real-time simulation models in AGILe to achieve comprehensive analysis and insights.

*NYSERDA*

NYSERDA is working with Reactive Technologies (RT), NYISO, and NYPA on a multi-year demonstration to deploy RT's GridMetrix technology to directly measure power system inertia on the New York electric grid. The project was initiated through a NYSERDA Future Grid Challenge award, which funded the initial installation of real-time inertia measurement devices across multiple locations on the system. The primary objective is to provide continuous, system-level visibility into grid inertia to support reliable operations and planning as renewable penetration increases. The project is currently focused on validating the operational value of real-time inertia data, with next steps expected to include evaluation of a viable deployment and identification of additional funding to complete and scale the demonstration.

*Multiple Utilities*

NYPA, GE Vernova, NYSERDA, NYISO, National Grid, PSEG-LI, Con Edison, and NYSEG/RG&E are collaborating on a project to investigate the stability risks of IBRs on grid reliability concerning the interconnection of wind and solar projects. Given that these risks are complex and difficult to measure, the project requires sophisticated EMT modeling to capture detailed equipment behavior. The initiative involves performing statewide EMT simulations across New York under scenarios of high IBR penetration to identify potential stability risks and to test possible mitigation strategies for the identified risks.

### 2.5.2 Challenges Identified

*Item 1: Increased IBR Penetration*

In systems with a high penetration of IBRs like solar and wind, the grid can become more vulnerable during disturbances, faults, or unusual voltage conditions, making it more challenging to maintain stable operations. Protection, control, and coordination challenges arise as the grid transitions from synchronous generation to inverter-dominated resources, impacting relaying performance, fault response, and system protection schemes.

*Item 2: Limitations of Existing Tools and Models*

Limitations of existing tools and models hinder accurate assessment of IBR-driven phenomena, requiring custom-developed impedance scanning tools and high-fidelity EMT and real-time simulation capabilities. Modeling complexity and the associated validation burden at scale present significant challenges, as statewide studies require detailed, validated models for IBRs, HVDC systems, and offshore wind resources across multiple platforms and operating scenarios.

### 2.5.3 Recommended Next Steps

- Develop and deploy high-fidelity simulation and modeling tools including EMT models, and impedance-scanning tools to assess IBR impacts under a range of operating conditions.
- Pilot advanced protection and control strategies for grids with high IBR penetration, focusing on fault response, temporary overvoltages, and system stability in both onshore and offshore networks.
- Expand validated IBR and HVDC model libraries in PSS/e and other platforms to support statewide planning, scenario analysis, and contingency studies for 2035 grid conditions.
- Quantify operational, reliability, and economic benefits of proposed integration strategies to inform NYISO, utilities, and regulators for broader adoption and policy support.

# 3 COORDINATION WITH CGPP

### 3.1.1 Accomplishments to Date

As part of its coordination with the CGPP, the ATWG developed a Screening Guide and associated framework to evaluate advanced technologies as alternatives to traditional transmission and distribution solutions. This initiative focused on three priority technologies identified by the Commission – DLR, Energy Storage for T&D, and PFC – and provided planners with practical guidance on their applicability for resolving grid needs.

The ATWG established a framework for evaluating each advanced technology which included criteria such as capacity increase, availability (describes the window of availability and/or effectiveness of the solution), as well as power flow modeling and cost assumptions for each technology type. To aid in the evaluation of grid needs against this framework, the Screening Guide suggests factors for characterizing grid needs including severity, duration, and frequency, enabling more meaningful comparisons between advanced technologies and conventional infrastructure.

In support of the framework, the group compiled cost and performance benchmarks and documented active projects across New York, including National Grid's operational deployment of LineVision's DLR system, Con Edison's multi-vendor DLR demonstration with EPRI, and Central Hudson's installation of SmartValve technology. The previously developed Unified Planning Guidelines (UPG) for energy storage was also leveraged in the development of the screening guide. To inform CGPP Cycle 2, the ATWG initiated a statewide DLR Potential Study. These accomplishments represent significant progress toward integrating innovative, cost-effective solutions that enhance system flexibility into the CGPP.

Certain utilities have included DLR and PFC as a component of some of their local transmission solutions as part of the project portfolio included in CGPP Cycle 1 capacity expansion modeling. Projects identified as part of the least cost plan to deliver New York State's objectives will be included in the CGPP Cycle 1 report.

### 3.1.2 Lessons Learned from First Cycle

*Magnitude of system needs*

CGPP involves planning for a large-scale transformation of the generation buildout in the state of New York, which results in significant overloads to transmission infrastructure in many cases. By their nature, many of the advanced technologies that have been considered to date are not able to provide the capacity increases that are needed to alleviate these significant overloads. Furthermore, if a traditional solution (e.g., a new line) is deemed necessary, it is typically right-sized to provide margin over the expected loading, eliminating the need to pair it with an advanced technology solution. This challenge does not apply to advanced conductors, which can be right-sized to alleviate larger overloads.

In instances of relatively smaller (e.g., 0-10%) overloads, an advanced technology solution can be more cost-effective than a traditional solution. However, there are some economic considerations which have not been fully accounted for in CGPP Cycle 1. Cycle 1 based solution development on static power flow models. However, it is likely that a small overload observed in a single time-slice power flow model may not represent an overload that occurs for a long duration. When observed over the course of an entire year, the constraint may occur infrequently and cause minimal resource curtailment. In these situations, resources may be more efficiently allocated elsewhere.

There is a dual challenge facing many types of advanced technologies in CGPP. On one hand, advanced technologies usually are not best suited for fully resolving severe constraints in long-term planning. On the other hand, mild constraints provide uncertain economic value without the benefit of 8760-hour production cost modeling.

A Call for Advanced Technology Concept Papers and vendor engagement process that incorporates these lessons learned may result in proposals that can address certain aspects of CGPP Cycle 2 – whether they are modeling needs or grid needs identified during the process – so that the JU are best positioned to propose cost efficient solutions. The JU maintain a focus on technologies that can be deployed (e.g., mature, cost-efficient, etc.) within CGPP's established timelines to successfully support CGPP objectives.

### 3.1.3 Next Steps and Opportunities for Cycle 2

- Progress proposed portfolios, with any advanced technologies, through the final stages of CGPP cycle 1, including Stage 5 capacity expansion modeling and development of the Cycle 1 report.
- To the extent possible, leverage production cost modeling (PCM), which is required in Cycle 2, to identify the most suitable applications of advanced technologies. PCM can provide more information regarding the duration over which a constraint occurs, which is key for determining applicability for advanced technologies such as DLR and storage.
- Continue to focus the ATWG's purpose on deliverables that will support CGPP, including evaluating whether aspects of the Commission's November 2025 Order Modifying CGPP[11] may be addressable.
- Energy Storage for T&D Applications: work collaboratively with CGPP modeling teams to ensure that energy storage modeling assumptions are accurate in both capacity expansion and production cost models. For example, long-duration energy storage must be able to charge and discharge over multi-day periods.
- DLR and PFC: work collaboratively with CGPP team to analyze Cycle 2 results as they become available and select the best use-cases for DLR and PFC.

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11. Transmission Planning Proceeding, Order Modifying Coordinated Grid Planning Process (issued November 13, 2025).

# 4 PROGRAM CALENDAR

While the ATWG maintains a quarterly cadence, the content and format of each quarter's activities will adapt to the progress of CGPP. During some quarters, the ATWG may host an interactive session like a virtual webinar, while in others the group may share updates through other platforms such as the ATWG website.[12] Regularly scheduled activities include:

- Annual Report and related Stakeholder Webinar
- Call for Advanced Technology Concept Papers
- Quarterly Stakeholder Updates (format may vary)

The ATWG representatives meet monthly and may hold additional meetings as needed. Task Forces and subcommittees set their respective meeting cadences which have ranged from bi-weekly to monthly or longer depending on activities.

## 4.1 Annual Report and related Stakeholder Webinar

Consistent with the Commission's orders, the ATWG will file by January 31 of each year an Annual Report summarizing the ATWG's activities for the prior year. Following the filing, the ATWG will host a Stakeholder Webinar during the first quarter of the year to present a summary of the Annual Report and to invite questions and comments from the stakeholder community.

## 4.2 Call for Advanced Technology Concept Papers

The ATWG issued its first Call for Advanced Technology Concept Papers (Call for Papers) in Q2 2024 and its second in Q4 2025. These solicitations are designed to maintain a pipeline of potential technologies and solutions to support electric T&D systems and help New York meet its clean energy goals. The ATWG plans to tailor the Call for Papers to address priority needs, technologies, and topics identified through the CGPP as well as past solicitations. Table 2 below summarizes the objectives and requirements for submissions.

12. Advanced Technologies Working Group, Joint Utilities of New York, *available at* https://jointutilitiesofny.org/advanced-technologies-working-group

*Table 2. Summary of the Scope and Submission Requirements included in the Call for Advanced Technology Concept Papers.*

| Call for Concept Papers Scope | Concept Paper Submission Requirements |
|---|---|
| This call is specifically targeted towards:<br>• Technologies with the potential to enhance transmission grid performance broadly.<br>• Technologies that can alleviate or address large-scale grid needs arising from substantial capacity additions.<br>• Technologies that can be paired with traditional grid solutions to flexibly and incrementally add system capacity.<br>• Technologies with a demonstrable deployment record and real operating data.<br>• Technologies for which a reasonable amount of cost data exists. | • A detailed description of the technology or solution, including potential use cases and grid services that the technology may support.<br>• Specific examples of where the technology or solution has been deployed.<br>• An outline or preliminary plan for implementing the technology or solution within the New York electricity grid.<br>• To the extent possible, provide cost data that can facilitate comparisons with existing and alternative solutions.<br>• Specific benefits that the technology supports, either directly or indirectly.<br>• A description of how the technology is typically represented in commercially available power system tools. |

In response to the 2025 Call for Papers, the ATWG received six Concept Papers covering a range of technologies, as summarized in Table 3. In January 2026, the ATWG hosted an interactive webinar to share an update on the working group's evaluation of these concept papers, which is available on the ATWG website for stakeholders to access.

*Table 3. 2025 Concept Paper Submissions.*

| Group | Concept Paper Title |
|---|---|
| CTC Global | 1. Affordably & Rapidly Increasing Transmission Capacity with Aluminum Conductor Composite Core (ACCC) Conductors |
| Pitch Aeronautics | 2. Weather-Based Dynamic Line Ratings |
| Standard Potential | 3. Responsible Grid Program |
| GE Vernova Advanced Research (VAR) | 4. Distributed AI Inference (DAI2) For New York State Grid Optimization<br>5. HVDC Transmission Access Point<br>6. Thermal Energy Storage (TES) Integration with Gas Turbine (GT) Power Generation to Increase Grid Flexibility and Stability, and Lower Gas Turbine (GT) Emissions |

## 4.3 Quarterly Stakeholder Updates

Quarterly touchpoints allow the ATWG to engage the technology stakeholder community at regular intervals throughout the year. The content and format of these updates will depend and adapt based on the evolving needs of the CGPP. As a result, some quarters may feature interactive sessions like virtual webinars, while in other quarters the group may share updates through other platforms such as the ATWG website. These updates may include policy and regulatory initiatives, program developments, insights from ongoing R&D activities, and announcements such as Calls for Papers or the results of recent solicitations. In this way, the quarterly updates remain dynamic and responsive to ongoing project cycles and serve as a medium for program feedback from stakeholders and an opportunity for questions.

# 5 BUDGET AND FUNDING

## 5.1 Ongoing Program Support

The ATWG requires funding to support activities related to studies and analyses. NYSERDA has provided this funding to date. The ATWG will continue to seek NYSERDA funding, and also seek opportunities to collaborate with other funding entities such as the United States Department of Energy, technology vendors, or host utilities.

## 5.2 Study and Demonstration Project Funding

From time to time, the ATWG may identify a study or demonstration project that would help address one or more barriers to deploying advanced technologies. Table 4 details the $17.7 million in funding that NYSERDA has estimated for studies and demonstration projects as of the date of this report. Of this amount, NYSERDA has committed $2.5 million for studies and $15.2 million for demonstration projects, with an initial budget of $2 million for studies and $15 million for demos funded through the first round of the Clean Energy Fund (CEF), which concluded in 2025. Any additional funding requests from the ATWG will be pursued under the second round of the CEF, which is authorized for the 2026-2030 period.

*Table 4. ATWG Activities and Budget Approved to Date.*

| Activity Type | Budget | Activities | Preliminary Budget Allocation | Preliminary Budget Allocation Total |
|---|---|---|---|---|
| Studies and Analysis | $2.5 million (NYSERDA) | T&D Energy Storage Potential Study (completed) | $0.5M | $2.5 million |
| | | Energy Storage Deep Dive (Con Edison) (completed) | $0.5M | |
| | | Energy Storage Deep Dive (Central Hudson) (in progress) | $0.5M | |
| | | DLR Potential Study (in progress) | $0.5M | |
| | | Advanced Conductor Potential Study (new) | $0.5M | |
| Demonstration Projects | $15.2 million (NYSERDA) | Grid Inertia Measurement Demonstration Project | $4.0M | $15.2 million |
| | | DLR Demonstration Projects | $5.0M | |
| | | PFC Demonstration Project | $0.5M | |
| | | Advanced Conductor Demonstration Projects | $5.7M | |