

# Resource Adequacy for the Energy Transition: States and Industry Discussion New York State

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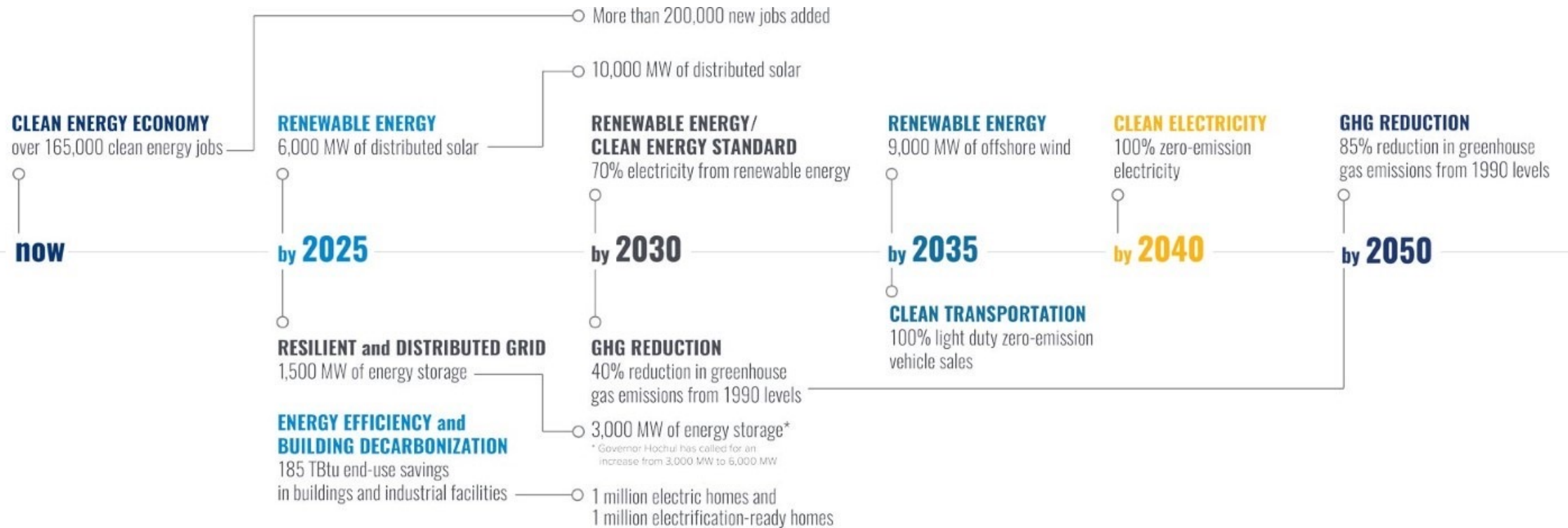
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**NYSERDA**

# Introduction and Background

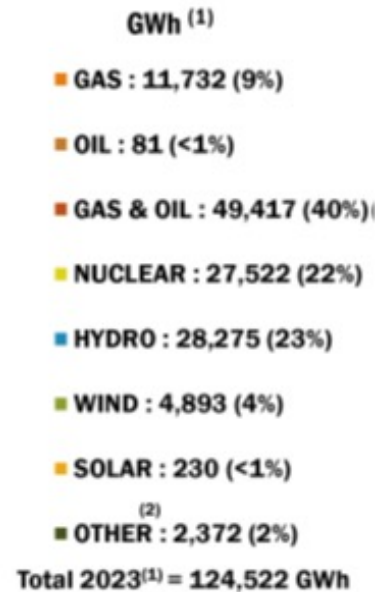
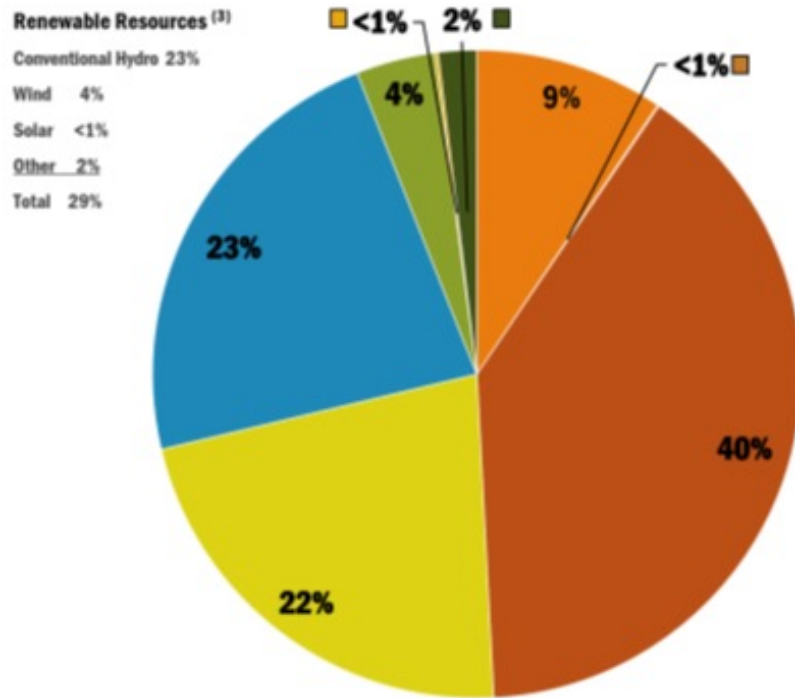
# New York's Nation-Leading Climate Targets



Goal - Minimize impacts on New Yorkers - emphasis on affordability, climate justice, job creation, and grid reliability.

# New York's Electricity Profile

## 2023 NYCA Energy Production by Fuel Type

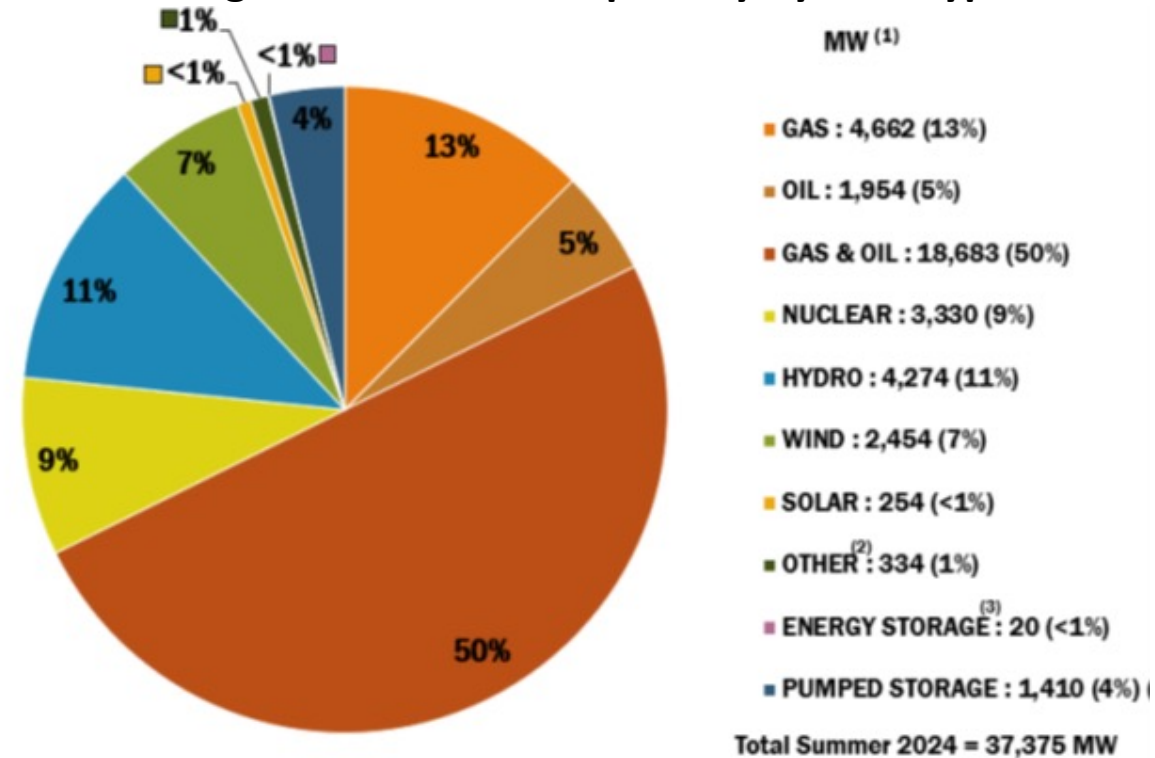


(1) Only includes fuel types with positive net energy and are rounded to the nearest whole GWh

(2) Includes Methane & Refuse

(3) Renewable Resources do not necessarily match the NYS Clean Energy Standard (CES) definition

## 2024 Existing NYCA Summer Capability by Fuel Type



(1) All values are from the Summer Capability column in Table III-2a and are rounded to the nearest whole MW

(2) Includes Methane & Refuse

(3) Energy Storage includes Flywheel and Battery Storage

# Energy Transition and Electricity Load Growth

# New York's Energy Transition Risk

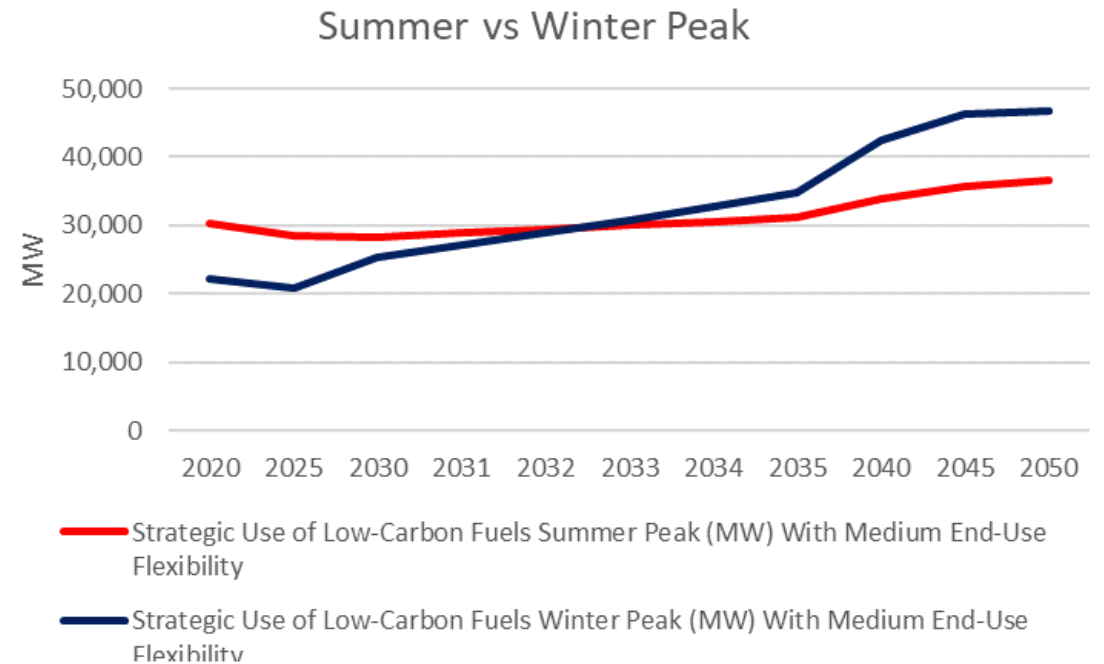
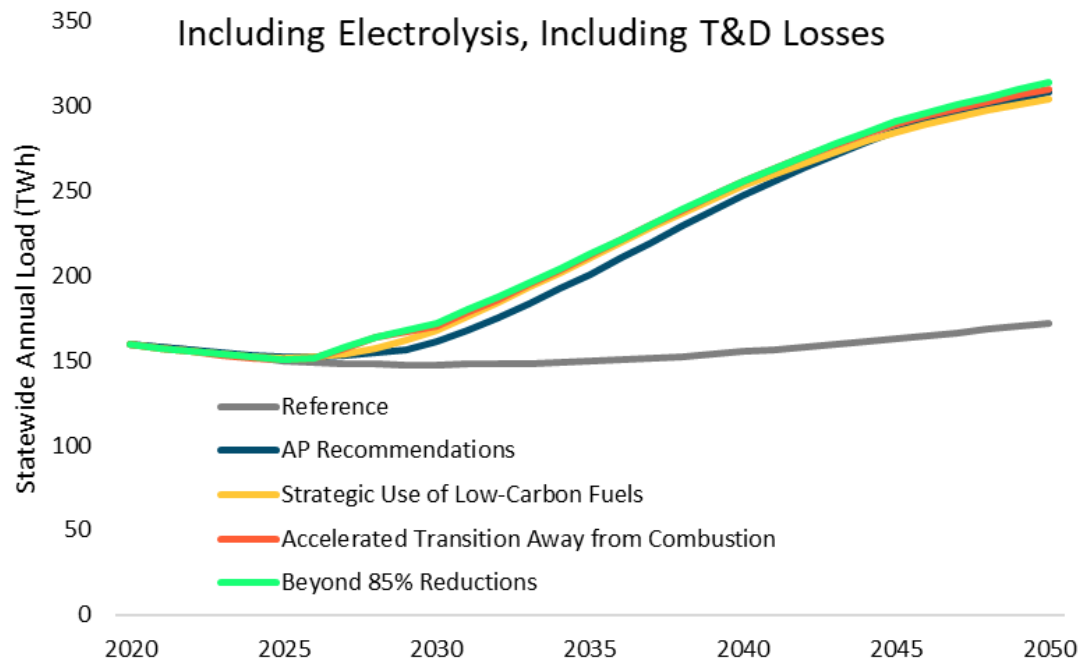
- Qualitative Risk Assessment of the New York State Energy Security Plan
- Electricity System Risk
  - Reliability margins and transmission security margins are expected to shrink, especially under extreme weather conditions, as loads are projected to grow.
- Likelihood – progress already underway and altering New York's energy risk profile
- Driver – Climate Act impacts on generation, transmission, and load components of the bulk electric system – critical to understanding challenges to reliable electric service
  - Policies, economics, and technologies continue to rapidly evolve.
- Requirements of the Climate Act have shifted electricity planning from focused primarily on reliability and cost to now include emissions and equity goals
  - New York is incorporating this energy transition into policymaking and grid planning and “doing it right” with a multi-agency collaborative process that takes into account reliability and resilience concerns.
  - Policy and plans incorporate flexibility up front to push for speedy transition with needed flexibility to retain high reliability standards.

# New York's Energy Transition Risk

- Electrification - Growth of electric demand due to electrification of the energy system – increasing the need for more generation and transmission infrastructure to supply customers reliably.
- Electrification will reduce need for traditional fossil fuels like natural gas and petroleum products.
  - Contraction of the fossil fuel sector (liquid petroleum fuels and natural gas) due to decrease in demand and overall number of market participants.
    - Need to manage industry consolidation and reduced competition, increasing costs
    - Reduced supply chain resilience - need to maintain secure and reliable fuels supply chain for heating and transportation end-use sectors during energy transition.
- Strategies for dealing with “just-in-time” inventories
  - Increased awareness and market coordination
  - Pro-active regulatory relief
  - Consumer watchdog
- Flexibility in meeting energy transition goals to ensure fuel supply reliability.
- Implementation of new energy sources such as renewable natural gas, hydrogen, and other biofuels in end-use sectors (buildings, industrial, transportation).

# NYS Electricity Load Growth Forecast

Electrification leading to significant load growth and a move from a summer to winter peaking state





# Energy Transition Electricity Growth Solutions

- Markets designed to create price signals for retention of resources and resource additions that assist in maintaining reliability.
- New renewable capacity resources coming into service
  - New generators are primarily intermittent and limited duration (solar and wind) so will need more megawatts to replace retiring thermal generation
  - Battery storage resources fill in voids in renewable resources output but extended high-demand periods rapidly deplete storage capabilities.
- Construction of additional transmission facilities
  - Transmission expansion is necessary to maximize access to renewable resources.
- Increased energy efficiency and integration of demand-side resources
- Building electrification roadmap

# Renewable Energy Growth

- New York State Solar Growth
  - 5,576 MW of distributed solar capacity online out of 2025 6,000 MW solar target
  - Over 224k completed projects
- New York Offshore Wind Projects
  - 130 MW South Fork Wind operational (first offshore wind project in NYS)
  - Empire Wind 1 (810 MW) and Sunrise Wind (924 MW) offshore wind projects under contract – largest power generation projects in NYS in over 35 years, set to begin operation in 2026.
  - [10-Point Action Plan for Large-Scale Renewables](#)
  - \$200 million to support offshore wind manufacturing and logistics supply chain
- New York Energy Storage – allows NY's electricity grid to reliably meet peak demands with cleaner energy
  - \$300 million to support 1,2000 MW of energy storage projects across the state
  - Energy Storage Roadmap – path to 6 GW y 2030
- **New York currently has 59% of 2030 energy needs operating or under development/contract towards the 70% renewable electricity goal.**

# Electricity Transmission Growth

- New York is building out the State's transmission infrastructure to support a zero-emission grid.
  - NYSERDA, NYPA, DPS, utilities, NYISO, and private sector supporting major investments to modernize the grid. \$8 billion + investment in grid improvements across NYS.
  - 350 miles of bulk transmission upgrades either come online or are under construction
  - 62 approved transmission projects to support clean energy integration will be in service between 2026-2030
- Champlain Hudson Power Express and Clean Path NY (part of NYSERDA Tier 4) – largest transmission infrastructure development in NYS in the last 50 years are underway.
  - Combined over 500 miles of high voltage direct current line, equivalent to 2,550 MW of new transmission capacity to bring renewable energy from Upstate NY and Quebec to NYC.
  - CHPE expected to start delivering energy in 2026
  - Clean Path NY operational by 2030

# **Electricity Transition Planning Case Study and Climate and Grid Resilience**

# Case Study: New York State “Peaker Rule”

NYS Department of Environmental Conservation (DEC) “Peaker Rule” serves as an example of how the need for transition incorporates reliability requirements.

- NYS DEC regulation to limit NOx emissions from combustion turbines – primarily impacting power generator “peakers” to maintain bulk power system reliability during peak electricity demand.
- Built into the rulemaking are considerations for reliability, ensuring fastest possible transition given constraints:
  - Allows temporary extensions of peakers that exceed emissions limits if they are deemed a “reliability resource” via a number of mechanisms, primarily NYISO evaluation.
  - Allows extensions of up to four years under specified circumstances, with the longest circumstance contingent on resources being selected and in process of deployment.

1,500 MW scheduled to shut down by 2025. 1,000 MW retired by May 2023.

# Case Study: New York State “Peaker Rule”

New York Independent System Operator (NYISO) declaration of potential NYC reliability need for summer 2025

- While resources needed to maintain reliability are in the construction queue, deployment of envisioned resources has a mismatch with original Peaker Rule closure timeline
- Deployment of CHPE is projected to address 2025 deficit, but is not due until 2026
- Projections of peak day demand under expected weather conditions and forecasted economic and policy demand increases, NYC zone may have reliability margin deficit as much as 446 MW for 9 hours on peak day; Extreme heat can exacerbate this issue
- These findings led to the activation of Peaker Rule’s built in grid reliability provisions, envisioned and included to prevent unforeseen circumstances and allow flexibility.
  - **Short-Term Solution:** November 2023 – NYISO announced postponement of the retirement of 590 MW natural gas fired generation to maintain reliable power supply. Source: NYISO Short-Term Assessment of Reliability (STAR) Report
  - **Long-Term Solution:** Champlain Hudson Power Express (CHPE) transmission line from Quebec to New York City. (Scheduled to come online in spring 2026).

# Climate Change and Grid Resilience

## Impacts of Climate Change on the New York Energy System (December 2023)

- As the impacts of climate change intensify, important for energy system planners to account for the effects of warming and more severe storms.
- Long-term modeling to understand how changing weather would alter energy consumption and generation under three different climate futures and two distinct infrastructure and policy pathways.
  - Heating and cooling demand, transmission ampacity, thermal generator output, solar output.
  - Integration Analysis modeling toolkit to examine a Reference case and a Climate Act compliant decarbonization scenario.

# Climate Change and Grid Resilience

## New York State Climate Impacts Assessment

- Climate change is affecting New York State now and projected to continue to change and affect every region of the State.
- Impacts, including rising sea levels in NYS, will be substantial with the frequency and intensity of extreme events projected to increase.
- Climate hazards can be compounded causing more serious impacts and marginalized communities are more vulnerable to impacts.
- Critical infrastructure is vulnerable to climate-related impacts. Designing and planning for new infrastructure and upgrading existing infrastructure to incorporate climate projections can build in climate resilience and improve reliability.
- Including equity in adaptation and resilience actions to GHG reduction strategies is crucial for success.



# Climate Change and Grid Resilience

- Utility Climate Vulnerability Studies – requirement for utilities in New York State to submit a Climate Change Resilience Plans to New York State Department of Public Service (November 2023)
- New York's Grid of the Future – Unlock innovation and investment to deploy flexible resources like distributed energy resources (DERs) and virtual power plants (VPPs) to achieve clean energy goals at a manageable cost and at the highest level of reliability.
  - New York Grid Flexibility Potential Study
  - Funding for demonstrations of interoperability of grid-edge devices and reliability of load flexibility
  - Utility Distributed System Implementation Plan
  - Grid of the Future Plan – assess the current structure of New York's electric system and industry, develop vision for 2030, 2040 and develop a grid evolution roadmap.



# Questions?

## Contact:

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# Appendix and Reference Slides

# **Identified Risk Mitigation Measures (New York State Energy Security Plan)**

# Identified Risk Mitigation Measures

- Continue to invest in NY-Sun Residential and Commercial incentives, particularly the Affordable Solar Residential Onsite Incentive.
- Continue to invest in shared renewables projects where traditional solar infrastructure is not feasible, like in non-residential and multi-unit housing.
- Investigate supporting development of zero-emission microgrids and district clean energy systems.
- Incentivize Community Choice Aggregation (CCA) Program where feasible to allow for more effective clean energy adoption among municipalities.
- Continue to invest in the Solar Energy Equity Framework (SEEF) program to transition primary education facilities toward solar consumption/generation sources.
- Continue to invest and plan for offshore wind developments.
- Continue to support the NYPA BuildSmart program to understand changing state energy needs.
- Identify electricity transmission and distribution line upgrades and developments that will effectively support shifting energy demand without compromising energy reliability.

# Identified Risk Mitigation Measures

- Continue to support the Retrofit NY initiative to improve affordable housing energy efficiency standards. Utilize the Integrated Physical Needs Assessment to approach efficiency programs.
- Support and utilize NY Green Bank funding and partnerships to promote energy reliability projects that compliment electrification and clean energy developments.
- Further support Property Assessed Clean Energy financing for stakeholders to transition to clean energy sources.
- Continue to support the Clean Energy Communities and the Community Energy Engagement programs to provide technical assistance for localities to effectively switch over to clean energy sources.
- Continue to support the Clean Green Campuses program to incentivize effective clean energy transitions in college campuses and surrounding communities.
- Support further development of energy partnerships, technology research, and business models prioritizing a reliable energy transition.
- Utilize the Clean Energy Business Incubator Program to support clean energy developers.



# Identified Risk Mitigation Measures

- Support energy storage technology programs and resources. This includes the NY Battery and Energy Storage Technology Consortium (NY-BEST). This includes reducing the barriers to distribute energy storage technology by reducing financing costs and maximizing tariffs. NYSERDA participates in the Inter-Agency Fire Safety Working Group.
- Utilize NYPA's Low-Cost Power for Regional Economic Development program to minimize potential transitional costs in the Niagara Region and counties near the St. Lawrence Power Project.
- Continue to support and monitor Clean Energy Fund (CEF) Agriculture initiatives, including Clean Energy for Agriculture Task Force (CEATF) proposed initiatives.
- Monitor, contribute to, and fulfill CEF initiative portfolios and obligations surrounding clean energy investments across sectors.
- Monitor the effectiveness of the current Value Stack, Value of Distributed Energy Resources (VDER), and explore updates as warranted to incentivize reliable electricity service transitions.
- Explore opportunities to use existing clean energy training programs to meet local and state employment needs, especially in replacement of the existing energy workforce and in support of Disadvantaged communities. Existing programs include Clean Climate Careers, Solar Ready Vets, and the Community Greenworks Initiative.

# Identified Risk Mitigation Measures

- Renew city-based competitions, like the Five Cities Energy Plan, to incent widespread emissions reduction and energy efficiency upgrades in major NY metropolitan areas.
- Update or evaluate the effectiveness of electric vehicle (EV) incentives, such as the Drive Clean Rebate Program and NYS Truck Voucher Program to incentivize the uptake of EVs.
- Continue to invest in efficient alternatives to liquid fuel-powered transportation methods. This includes incentivizing efficient public transportation, energy capture, and transitions to electric buses.
- Use the Clean Energy Communities Program's Clean Fleets toolkit to support local vehicle electrification.
- New York Cap and Invest (NYCI): Explore the feasibility of a market-based emissions reduction program to lower transportation emissions.
- Assess the viability of capacitor banks along transmission systems to increase the capacity of transmission lines.
- Evaluate and monitor existing and updated Distributed System Implementation Plans (DSIPs) to assess obligations to maintain power reliability, security, and resilience under a transitioning power system.
- Explore the continued use of the Autonomous Grids – Identification, Learning, and Estimation (AGILE) for opportunities to address grid vulnerabilities with a focus on energy efficiency and clean energy reliability.