

## **De-Carbonization / DER Report for NYSRC Executive Committee Meeting 2/10/2023**

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The February 2023 edition of the De-Carbonization / Distributed Energy Resources (DER) Report includes the following items:

- NERC Reliability Leadership Summit
- NYSERDA – Governor Hochul announces Cap and Invest program to reduce GHG Emissions
- Major Microgrid to begin construction at JFK Airport
- US Department of Energy Microgrid Database
- NYISO Blog: Press Release: Completion of the latest class year Interconnection Study  
Article: Importance of Timing for the CHPE Transmission Project  
Article: Keeping the lights on in California, and what it means for New York
- Snapshot of the NYISO Interconnection Queue: Storage / Solar / Wind / Co-located Storage

### **NERC Reliability Leadership Summit**

The Reliability Issues Steering Committee ([RISC](#)) held its Biennial Reliability Leadership Summit on January 25<sup>th</sup>. Here are links for the [Meeting Summary](#) and [Prep Materials](#). The summit was attended by industry experts, state and federal regulators, leaders from the U.S. and Canadian government as well as more than 250 virtual observers. The summit focused on reliability issues related to energy policy, security, the rapidly evolving resource mix, technology innovation and their impacts on the reliable operation of the bulk power system.

The event featured four panels discussing matters relating to reliability, resilience, security operations and policy. There were several consistent themes throughout the panel discussions, including the need for:

- Greater collaboration, coordination and sharing on two fronts:
  - Sharing best practices between industry, government and policymakers.
  - Closing the regulatory gap between gas and electric industries, and the harmonization of gas system operations with electric reliability and resilience.
- Better understanding of the impacts of generation resource transformation, including the pace of change, the number of inverter-based resources connecting to the grid and extreme weather impacts.
- New and improved methods of measuring resiliency due to the rapidly changing risk profile, which is increasingly challenged by extreme weather.
- Enhanced operational visibility, situational awareness of distributed energy resources and potential standards in this area.
- Greater agility in the NERC standards development and implementation process.
- Keen attention to the constantly evolving security threat environment, including a paradigm shift from prevention to a system of detection, investigation and response as well as a heightened focus on high-priority assets critical to reliability and resilience.

The panelists agreed that NERC is in a unique leadership position in educating policymakers and stakeholders, highlighting reliability issues through its assessments and reports and convening industry, policymakers and stakeholders to discuss solutions at events like the Reliability Leadership Summit.

Jim Robb, NERC's president and CEO, closed the summit by stating that "The goal of the electric system is to strike a balance between reliability and security, access and affordability, safety and the environment. Recent major events highlight the need to regain the balance across all three."

Feedback and observations from the event will be shared in a follow-up RISC report, expected to be published in August.

## **Governor Hochul Unveils Cap-and-Invest Program to Reduce Greenhouse Gas Emissions**

From the [NYSERDA Newsroom Website](#): On January 10<sup>th</sup>, Governor Hochul directed the Department of Environmental Conservation and the New York State Energy Research and Development Authority to advance an economywide Cap-and-Invest Program that establishes a declining cap on greenhouse gas emissions, invests in programs that drive emissions reductions in an equitable manner prioritizing disadvantaged communities, limits costs to economically vulnerable households, and maintains the competitiveness of New York industries. In addition, Governor Hochul will propose legislation to create a universal Climate Action Rebate that is expected to drive more than \$1 billion in future cap-and-invest proceeds to New Yorkers every year.

Beginning immediately, DEC and NYSERDA will design a program that sets an annual cap on the amount of pollution that is permitted to be emitted in New York, as recommended in the recently finalized [Climate Action Council Scoping Plan](#). Every year, the emissions cap will be reduced, setting the State on a trajectory to meet Climate Act requirements of 40 percent in emissions by 2030, and at least 85 percent reduction from 1990 levels by 2050. The program design will prioritize five core principles:

- **Affordability**: A Cap-and-Invest Program to create a universal Climate Action Rebate that is expected to drive more than \$1 billion in future cap-and-invest proceeds to New Yorkers every year. The Climate Action Rebate will be designed to mitigate consumer costs, while preserving crucial funding for consumer-led decarbonization efforts, including energy efficiency measures that reduce energy costs, clean mobility solutions that reduce transportation costs, and other investments that improve air quality and create new job opportunities.
- **Climate Leadership**: To encourage the concept of Carbon Pricing, DEC and NYSERDA are directed to design a program with the capacity to join other current or future programs, which can lower the price of the transition to a greener economy, overall.
- **Creating Jobs and Preserving Competitiveness**: New York's Cap-and-Invest Program will be designed to launch new investment in industries intended to create tens of thousands of good paying jobs in areas of vehicle charging installations and green manufacturing. DEC and NYSERDA to design a cost-mitigation program to ensure New York industries are not put at a competitive disadvantage.
- **Investing in Disadvantaged Communities**: The program will not allow the use of offsets that could allow high-emitting sources to continue to pollute and will instead be designed to ensure pollution burdens are reduced. Between 35 to 40 percent of the benefits of cap-and-invest resources will directly benefit disadvantaged communities, and the program will be designed to ensure pollution burdens are reduced in frontline communities. These investments will fund programs to improve air quality, reduce reliance on polluting power plants, retrofit homes and schools, and decarbonize transportation systems.
- **Funding a Sustainable Future**: Cap-and-Invest will provide funding needed to support achievement of New York's climate goals. From helping business owners electrify operations to funding electric vehicle (EV) chargers and energy efficiency investments that will reduce energy bills.

Large-scale greenhouse gas emitters and distributors of heating and transportation fuels will be required to purchase allowances for the emissions associated with their activities. By applying to each metric ton of carbon emissions, the Cap-and-Invest Program will incentivize consumers, businesses, and other entities to transition to lower-carbon alternatives. Proceeds will support the State's critical investments in climate mitigation, energy efficiency, clean transportation, in addition to funding an annual Climate Action Rebate that will be distributed to all New Yorkers to help mitigate any potential consumer costs associated with the program.

It was noted that New York's electricity system is already part of a regional cap-and-invest style program, as exemplified with the Regional Greenhouse Gas Initiative (RGGI). Since RGGI was established in 2005, the program has helped reduce greenhouse gases from power plants by more than half and raised nearly \$6 billion to support cleaner energy solutions amongst its 12 participating states.

### **Major Microgrid to Begin Construction at JFK Airport**

Multiple articles from [Utility Dive](#), [Microgrid Knowledge Newsletter](#) and [Gothamist](#) describe a large (11.34) MW microgrid project, soon to be underway at JFK airport, which will be built, owned and operated by [AlphaStruxure](#) (link to their [JFK Case Study](#)), a joint venture of Schneider Electric and Carlyle Investment group. The microgrid will be built as part of the airport's \$9.5 billion first phase of New Terminal One. The terminal will encompass about 2.4 million square feet and serve as the largest international terminal within the airport.

The facility is actually four microgrids rolled into one. Each microgrid serves as a power island, and can operate separately or collectively as one microgrid, establishing what the developer is calling a federated microgrid. The configuration illustrates the concept of [Energy Sharing \(as defined in Microgrid Knowledge 10/3/22\)](#), within and between multiple microgrid resources.

When completed, the facility will have:

- 7.66 MW of rooftop solar
- 3.68 MW of fuel cells
- 2 MW / MWh Battery energy storage

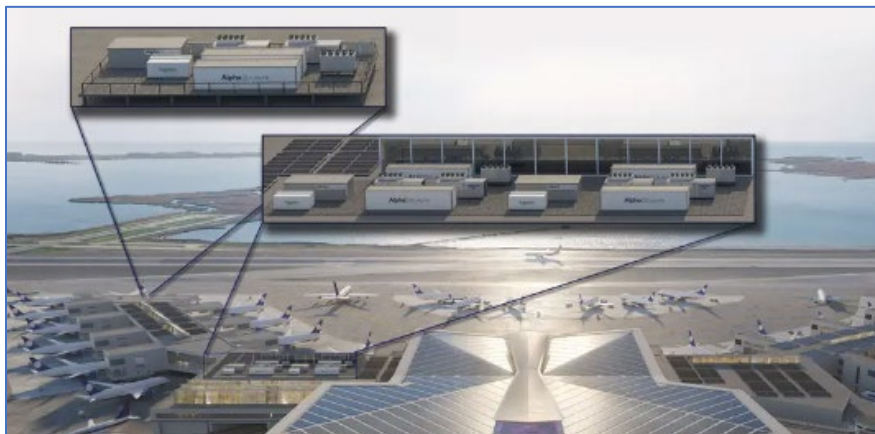


The reliability benefit is intended to avoid events like the [11-hour power outage](#) that shut down Georgia's Hartsfield-Jackson Atlanta International Airport in late 2017.

Under normal conditions, the complex will be conventionally connected with the grid, buying and selling energy and services to the market. But during a power outage, the microgrid will be configured to operate independently of the grid. The intent is to maintain operational capability during a power outage, supporting as much of the facility as possible, up to 23 airport gates and more than 177,000 square feet of dining, retail, lounges and recreational space.

The facility will have 13,000 solar panels on the rooftop, making it the largest rooftop solar array on any US airport and the largest in New York City.

The fuel cells will operate with commercially provided natural gas, but the developer hopes to convert the fuel cell operation to renewable natural gas or green hydrogen in the future.

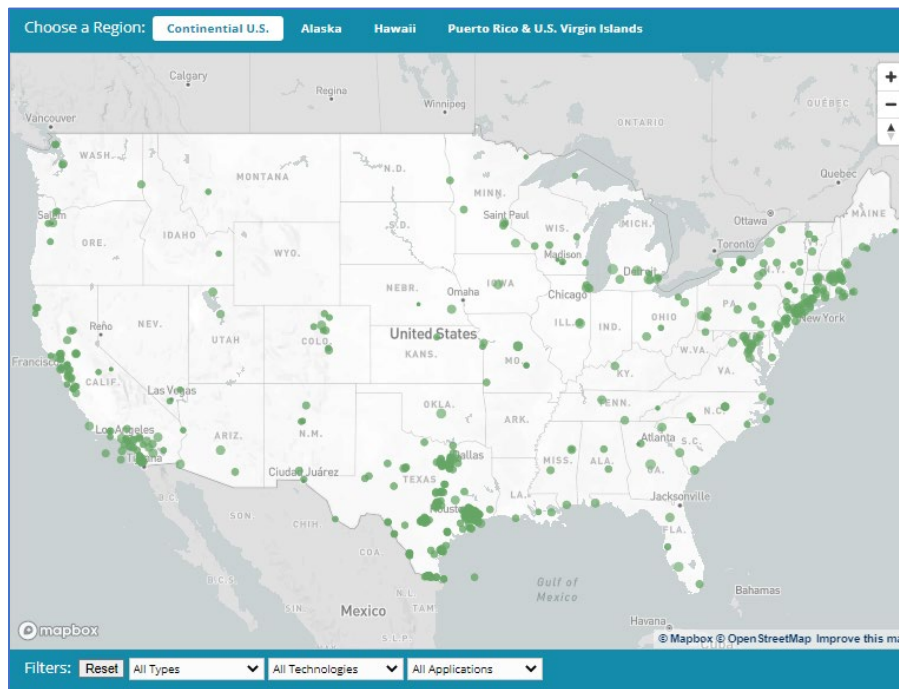


**US Department of Energy Microgrid Database**

There are about 890 microgrids are listed in the [U.S. Department of Energy Database](#), representing a total of approximately 4,260 MW operate in the United States. They are situated mainly in California, Texas and on the East Coast. New York State has 65 microgrids, totaling 658 MW in total capacity. The larger sites in the state are categorized primarily as CHP (Combined Heat & Power), grid connected, and associated with government, hospitals, universities, or large residential complexes.

The database defines a microgrid as a network of distributed energy resources and loads that can disconnect and re-connect to the larger utility grid as a single entity, allowing the connected loads to be served during utility outages. Microgrids can also be found in remote locations where they may not be connected to a larger grid. Some standby/backup generators are configured to connect/disconnect and operate independently from the utility grid during an outage, but these backup generators are not included in the database unless they are part of a microgrid that serves other functions, such as daily power requirements or participation in utility markets.

The map below shows the geographic distribution of microgrids in the USA. The corresponding database can be filtered by state and searched by text field. The entire table can be downloaded to an Excel file. Here is the [Link](#) for filtered list with New York State data, which can also be downloaded to an Excel table.



The database contains the following fields of information:

Organization Name	Total Capacity (kW)	Fuel Cell Capacity (kW)
Project Name	Generation Capacity (kW)	Non-CHP Fuel Cell Capacity (kW)
City	Storage Capacity (kW)	Non-CHP Diesel Capacity (kW)
State	Technologies	Non-CHP Natural Gas Capacity (kW)
Operational Year	Last Verified Date	Non-CHP Biofuel Capacity (kW)
Most Recent Install	CHP Capacity (kW)	Unknown Capacity (kW)
Primary Application	Solar Capacity (kW)	ADV Controls
Grid Connected	Wind Capacity (kW)	
Microgrid Type	Hydro Capacity (kW)	

### **NYISO: Announcements on the Blog Page of the NYISO Website:**

Features from the [NYISO Blog Page](#) include the following:

**Press Release:** On January 13<sup>th</sup>, the New York Independent System Operator (NYISO) [announced the completion of the latest class year Interconnection Study](#). Results include the acceptance of 27 new wind, solar, energy storage and transmission expansion projects totaling 7,452 MW.

The NYISO has also [issued a white paper](#) summarizing the interconnection and class year process. It is intended for media, policymakers and other interested parties. The white paper notes that the number of active projects in the Interconnection Queue has tripled over the last three years. In order to streamline the process, the NYISO has made a significant number of enhancements, including:

- Elimination of certain elements of the SRIS process that were duplicative or unnecessary.
- Enhancements to the interconnection portal application to provide more detailed and timely information regarding the status of each project.
- Development of new study report templates to significantly shorten System Impact Study reports and improving the management of “material modification requests” from developers seeking to change elements of their project in between study stages.

### **Article: Importance of Timing for the CHPE Transmission Project**

This [Article](#) refers to the recently completed [Reliability Needs Assessment \(RNA\)](#) study, which found thinning reliability margins across New York State. Risk factors that could cause near-term reliability challenges include:

- Greater-than-forecasted electricity demand
- Extreme weather such as heatwaves
- Delays in planned transmission and generation projects, most notably the approved Champlain Hudson Power Express project, scheduled to be in service in the spring of 2026
- Potential for additional generator deactivations or unplanned outages

The RNA found that New York City faces the greatest risk, with reliability margins projected to be just 50 MW in 2025, equal to less than 1% of the forecasted New York City peak demand. The risks in New York City are due to limited generation and transmission capability. In the case of generation, retirements of peaker plants pursuant to new emissions rules by the New York State Department of Environmental Conservation (DEC Peaker Rule) will reduce available resources for additional electricity at times of high demand.

A major risk factor identified in the RNA is a delay in the completion of CHPE, a 339-mile underground cable that will deliver 1,250 megawatts (MW) of emissions-free electricity from Hydro-Quebec to New York City. The project is scheduled to come online in mid-2026. As New York State moves to decarbonize the power grid, CHPE will serve as a valuable source of clean energy by bringing electricity directly to New York City.

Even with CHPE scheduled to begin operation in 2026, the margin increases substantially, but narrows again to about 100 MW by 2032 due to increases in demand. Without CHPE, in only a few years margins would be such that there will be more electricity demand on peak days than what the grid can provide, our models showed.

The report continues to stress that some generation affected by the DEC Peaker Rule may need to remain in service until permanent solutions are developed, in order to maintain a reliable grid.



**Article: Keeping the Lights on in California, and What it Means for New York**

This [Article](#) recounts how temperatures and extreme weather such as that which was experienced in California in early September of 2022, can stretch any power grid to its limits. California’s grid operator, the California Independent System Operator (CAISO) recorded record consumer peak demand during the heat wave, issuing several of what it called “Flex Alerts,” urging consumers to set their thermostats to 78-degrees Fahrenheit or higher, avoid using major appliances, and turn off unnecessary lights.

In addition, the CAISO requested the activation of four new, natural-gas generators to provide up to 120 MW to the grid, according to the California Department of Water Resources.

CAISO said the decision to dispatch the fossil-fuel generators was necessary to avoid blackouts. During the same period, CAISO approved extending what are known as “Reliability Must Run” (RMR) contracts through 2023 with four fossil-fuel power plants. RMR contracts require power plants to continue operating to meet capacity needs in return for specified compensation. CAISO had originally approved RMRs for these units in 2019, due to their concerns with projected capacity shortfalls. The extended agreements should address capacity concerns through the entirety of 2023.

In September, the state of California enacted a sweeping plan to achieve a zero-emissions grid by 2045. In New York, the Climate Leadership and Community Protection Act (CLCPA) requires transitioning the electric grid to renewable and zero-emissions resources by 2040.

Like California, New York’s grid also greatly relies on fossil fuel plants. Some of these generators, operate infrequently but are essential for reliability on high demand “peak” days. Known as “Peaker” plants, these units can be important for maintaining reliability and avoiding the kind of situations like California experienced this past summer.

Recent New York regulations require many of the Peaker plants to comply with stricter emissions requirements by the end of 2023 and 2025. Some units are planning to deactivate. Others may make investments to improve the unit’s emissions profile.

The challenge, as much of this generating capacity retires, will be to bring new, cleaner generation capacity on-line, with the operating attributes needed to maintain grid reliability, even on the most stressful, high demand days of the summer. If New York State experiences an imbalance between retirements and new generation coming onto the grid, then the NYISO, like California, may be required to ask generation to remain operational.

**Interconnection Queue: Monthly Snapshot – Storage / Solar / Wind / CSRs (Co-located Storage)**

The intent is to track the growth of Energy Storage, Wind, Solar and Co-Located Storage (Solar and Wind now in separate categories) projects in the NYISO Interconnection Queue, looking to identify trends and patterns by zone and in total for the state. The information was obtained from the [NYISO Interconnection Website](#), based on information published on January 20<sup>th</sup>, and representing the Interconnection Queue as of December 31<sup>st</sup>. Note that 20 projects were added, and 10 were withdrawn during the month of December. Results are tabulated below and shown graphically on the next page.

Total Count of Projects in NYISO Queue by Zone				
Zone	Co-Solar	Storage	Solar	Wind
A	3	10	12	4
B	2	2	14	1
C	5	14	46	9
D	4	3	8	4
E	10	9	39	9
F	6	12	42	
G		20	9	
H		8		
I		3		
J		27		31
K		59	2	29
State	30	167	172	87

Total Project Size (MW) in NYISO Queue by Zone				
Zone	Co-Solar	Storage	Solar	Wind
A	920	839	1,590	618
B	300	320	2,095	200
C	570	1,455	4,766	1,188
D	292	240	1,257	1,151
E	1,210	970	3,651	1,088
F	400	1,809	1,812	
G		2,270	243	
H		2,923		
I		1,000		
J		4,715		34,646
K		5,857	59	28,186
State	3,691	22,398	15,472	67,077

Average Size (MW) of Projects in NYISO Queue by Zone				
Zone	Co-Solar	Storage	Solar	Wind
A	307	84	132	155
B	150	160	150	200
C	114	104	104	132
D	73	80	157	288
E	121	108	94	121
F	67	151	43	
G		114	27	
H		365		
I		333		
J		175		1,118
K		99	29	972
State	123	134	90	771

