New York ISO
Independent System Operator

NPCC 2023 Interim
New York Area
Review of Resource Adequacy

Prepared by the NYISO for the NPCC covering the New York Control Area for the Study Period 2024-2026

Final

NPCC RCC Approved December 5, 2023

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Executive Summary

The New York Independent System Operator, Inc. (NYISO) conducts an annual Area Review of Resource Adequacy of New York's Bulk Power System (BPS) as required by the Northeast Power Coordinating Council (NPCC). As described in the NPCC's Directory 1 (R4 and R5), a Comprehensive Review of Resource Adequacy is required every three years and analyzes a time period of five years. In the two interim years between comprehensive reviews, each Planning Coordinator conducts an Annual Interim Review of Resource Adequacy that will cover, at a minimum, the remaining years of the five-year period studied in the Comprehensive Review of Resource Adequacy.

The purpose of this assessment is to demonstrate the NYISO's conformance with the applicable NPCC resource adequacy planning criteria.

The *2021 Comprehensive Review of Resource Adequacy* (2021 Comprehensive Review) covered the five-year study period of 2022-2026. This *2023 Interim Review of Resource Adequacy* (2023 Interim Review) report provides the second interim assessment of the NYISO's *2021 Comprehensive Review* covering the remaining three years of the study period (i.e., from 2024 through 2026), and it is based on the NYISO's 2023 reliability planning models.

This report demonstrates that New York State will meet the NPCC resource adequacy criterion that the probability of an unplanned disconnection of firm load due to resource deficiencies (i.e., Loss of Load Expectation, LOLE) shall be, on average, no more than one occurrence in ten years (0.1 days per year) for the baseline system covering the study period from 2024 to 2026.

The NYISO's *2023 Q2 Short-Term Assessment of Reliability* (STAR),[1] published on July 14, 2023, identified an actionable Near-Term Reliability Need beginning in summer 2025 within New York City, which will be addressed under the NYISO's Short-Term Reliability Process. This reliability need is based on a deficient transmission security margin (not on resource adequacy deficiencies) that accounts for expected generator availability, transmission limitations, and updated demand forecasts using data published in the *2023 Load & Capacity Data Report* (Gold Book). Specifically, the New York City locality is deficient by as much as 446 MW for a duration of nine hours on the peak summer day under expected weather conditions, after accounting for forecasted economic growth and policy-driven increases in demand for electricity. On August 4, 2023, the NYISO solicited solutions.[2]

[1] NYISO's 2023 Q2 STAR Report, available at: https://www.nyiso.com/documents/20142/16004172/2023-Q2-STAR-Report-Final.pdf

[2] 2023 Q2 STAR Solution Solicitation Notice, available at: https://www.nyiso.com/documents/20142/15930765/STRP-Q2-2023-Solicitation-Letter-Draft-vFinal.pdf

Introduction

The *2023 Interim Review* provides the second (of two) updates to the *2021 Comprehensive Review.* The *2021 Comprehensive Review* was based on the NYISO's 2021 reliability planning MARS models assumptions (such as information from the *2021 Load & Capacity Data Report* or *Gold Book*) and was approved by NPCC RCC on November 30, 2021. Since the approval of the *2021 NPCC Comprehensive Review*, the NYISO has conducted additional resource adequacy assessments as part of the current 2022-2023 cycle of the Reliability Planning Process (RPP) and as a part of the quarterly Short-Term Reliability Process (STRP).

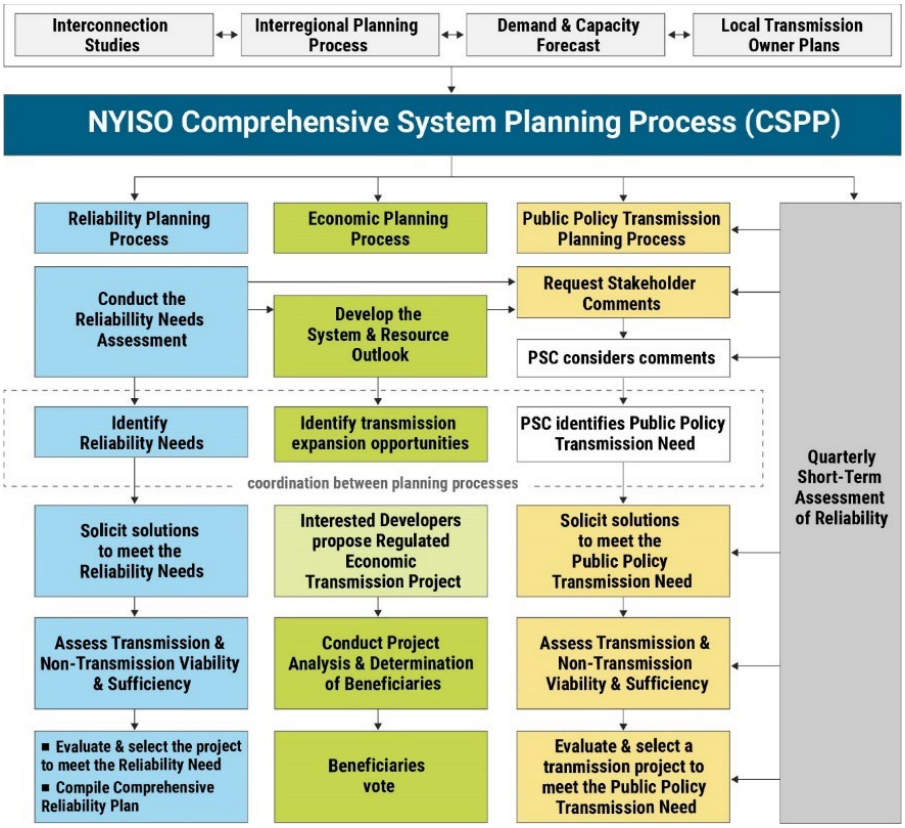
The NYISO also provides support to the New York State Reliability Council (NYSRC) in conducting an annual Installed Reserve Margin (IRM) study. This study determines the IRM for the upcoming Capability Year (May 1 through April 30). The IRM is used to quantify the capacity required to meet the Northeast Power Coordinating Council (NPCC) and NYSRC's resource adequacy criterion of "one day in ten years." The current IRM for the 2023-2024 capability year is 20% of the forecasted NYCA peak load. Additionally, the NYISO performs an annual study to identify the minimum Locational Minimum Installed Capacity Requirements (LCRs) for the upcoming capability year.

The major assumptions of this *2023 Interim Review* are consistent with the NYISO's 2023 reliability planning MARS models and inclusion rules application.

A visual depiction of the NYISO's Comprehensive System Planning Process is in Figure 1 below. The NYISO's Comprehensive Reliability Planning Process[3] includes biennial reliability planning reports focused on identifying and resolving Bulk Power Transmission Facilities (BPTF) reliability needs with longer lead times through the Reliability Needs Assessment (RNA) and the Comprehensive Reliability Plan (CRP). Reliability Needs Assessment (RNA) evaluates the reliability of the New York bulk electric grid considering forecasts of peak power demand, planned upgrades to the transmission system, and changes to the generation mix over the next ten years. The Short-Term Reliability Process (STRP) uses quarterly Short-Term Assessment of Reliability (STAR) studies to assess the reliability impacts of generator deactivations on the BPTF and non-BPTF (local), in coordination with the Responsible Transmission Owner(s). The STAR is also used by the NYISO, in coordination with the Responsible Transmission Owner(s), to assess the reliability impacts on the BPTF of system changes that are not related to a generator deactivation.

[3] Details of each process are in Attachment Y of the NYISO's Open Access Transmission Tariff and the applicable planning manual, which are available at: https://www.nyiso.com/manuals-tech-bulletins-user-guides.

Figure 1: NYISO's Comprehensive System Planning Process



Major Assumption and Changes

Demand Model

The 2023 Gold Book[4] provides an in-depth review of the load forecast and changing resource mix. The baseline forecasts, which report the expected NYCA load, include the projected impacts of energy efficiency programs, building codes and appliance standards, distributed energy resources, Behind-The-Meter (BTM) energy storage, BTM solar photovoltaic (PV) power, electric vehicle usage, and electrification of space heating and other end uses. The baseline forecasts also incorporate projected load increases from existing and future large load projects interconnecting to the transmission system.

Baseline energy and coincident peak demand increases significantly throughout the forecast period, driven largely by large load project growth in the early forecast years, and electrification of space heating, non-weather sensitive appliances, and electric vehicle charging in the outer forecast years. Increases in growth rates relative to the *2022 Gold Book* are primarily attributed to increased large load projects and EV charging impacts, including greater coincidence with periods of peak electric demand.

Over the course of the forecast horizon, significant load-reducing impacts occur due to energy

[4] NYISO's 2023 Load and Capacity Data (Gold Book), available at: https://www.nyiso.com/documents/20142/2226333/2023-Gold-Book-Public.pdf

efficiency initiatives and the growth of distributed BTM energy resources, such as solar PV. These impacts result primarily from New York State's energy policies and programs, including the 2019 Climate Leadership and Community Protection Act (CLCPA), the 2020 Accelerated Renewable Energy Growth and Community Benefit Act, the Clean Energy Standard, the Clean Energy Fund, the NY-SUN initiative, the energy storage initiative, and other PSC programs.

The baseline peak load forecast represents an annual average growth rate of 0.16% over the horizon of the Gold Book's five-year forecast. This compares to a growth rate of -0.30% from the 2022 Interim Review (based on the 2022 Gold Book forecast). The increasing summer peak during the outer years of the forecast is primarily attributed to electric vehicle charging during the system peak hour and electrification of non-weather-sensitive appliances. The higher forecasted growth in energy usage can be attributed primarily to the increasing impacts of electric vehicle usage, space heating electrification, and electrification of other end uses.

The load model in the NYISO's GE-MARS planning model consists of historical load shapes and Load Forecast Uncertainty (LFU). The NYISO uses three historical load shapes (8,760 hourly MW) in the GE-MARS model in seven different load levels using a normal distribution. The load shapes are adjusted on a seasonal (summer and winter) basis to meet peak forecasts while maintaining the energy target. LFU is applied to every hour of these historical shapes and each hour of the seven load levels is run through the GE-MARS model for each replication for resource availability evaluations. The historical shapes used in the past (2002, 2006, and 2007) were replaced by 2013, 2017, and 2018 starting with the 2022 reliability planning processes, based on detailed analysis performed by the NYISO.[5]

The BTM Solar PV forecast is discretely modeled with hourly production data by zone, while expected gross peak values are modeled. Historical load shapes are adjusted accordingly on both on-peak and off-peak hours.

The high load scenario reflects the 2023 Gold Book Higher Demand Policy Scenario forecast with energy efficiency impacts backed down to baseline forecast levels.

Figure 2 below shows a comparison of the baseline summer peak demand and **Figure 4** compare the baseline from the *2022 Interim Review* and high load peak demand forecasts.

Figure 3 details the amounts and direction of forecasted impacts on the baseline demand at the time of summer peak from energy efficiency and codes and standards (EE), BTM Solar PV, BTM energy storage, electric vehicles, building electrification and BTM non-solar Distributed Generation (DG) represented in

[5] Additional details are included in the March 24, 2022 LFTF/TPAS/ESPWG presentations, which are available at: https://www.nyiso.com/documents/20142/29418084/07%20LFU%20Phase%202_Recommendation.pdf and https://www.nyiso.com/documents/20142/29418084/08%20MARS_PlanningModel-NewLoadShapes.pdf.

the baseline forecast.

Figure 2: Comparison of Baseline Summer Peak Demand Forecasts

Study Year	Baseline Forecast (MW)		Delta *(current - past)*
	2022 Interim Review	2023 Interim Review	
2024	31,778	32,280	502
2025	31,505	32,390	885
2026	31,339	32,440	1,101

Figure 3: 2023 Gold Book - Summary of NYCA Baseline Summer Coincident Peak Demand Forecasts – MW

Year	(a) Econometric Peak Demand	(b) (-) EE and C&S	(c) = a - b End-Use Peak Demand	(d) (-) Solar PV, BTM	(e) (-) Non-Solar DG, BTM	(f) (-) BTM Storage Peak Reductions	(g) (+) EV Peak Demand	(h) (+) Building Electrification	(i) (+) Large Load Projects	(j) = c-d-e-f+g+h+i Baseline Summer Peak Forecast
2024	34,145	806	33,339	1,133	367	351	176	99	517	32,280
2025	34,509	1,279	33,230	1,165	376	453	257	133	764	32,390
2026	34,795	1,760	33,035	1,190	387	557	364	171	1,004	32,440

Figure 4: Comparison of High Load Summer Peak Demand Forecasts

Study Year	2023 Interim Review (MW) Load Forecasts		Delta *(High-Base)*
	Baseline load	High Load	
Summer			
2024	32,280	32,714	434
2025	32,390	33,071	681
2026	32,440	33,390	950
Winter			
2024	24,530	25,656	1,126
2025	25,100	27,104	2,004
2026	25,700	28,749	3,049

Study Year	High Load Forecast (MW)		Delta *(current vs past)*
	2022 Interim Review	2023 Interim Review	
Summer			
2024	32,849	32,714	-135
2025	32,854	33,071	217
2026	32,946	33,390	444
Winter			
2024	25,315	25,656	341
2025	25,845	27,104	1,259
2026	26,480	28,749	2,269

Resources

For this review, resource assumptions are based upon the 2023 summer capability of generation resources in the New York as reported in the *2023 Gold Book*. Resources values in Figure 5 include resources electrically internal to New York, additions, re-ratings, proposed deactivations, purchases, sales, UCAP Deliverability Rights (UDRs) with firm capacity, and Special Case Resources (which are a demand-response capacity market program).

A key part of the NYISO's reliability process is to apply conservative inclusion rules so that only those projects that have a high level of certainty of being completed are planned for, based on review of their regulatory, financial, and construction status. This often results in only limited amounts of generation and transmission projects being included in the base case. It is important to note that the NYISO Interconnection Queue contains an unprecedented number of proposed projects in various stages of development. Tables IV and VII from the NYISO's Gold Book contain proposed generation and transmission projects that are in a more advanced stages of the interconnection process—of which only a few have achieved sufficient milestones to be included in this plan.

The *2023 Interim Review* assumes:

- A total of 1,963 MW (summer capability) of proposed generation projects, mainly wind and solar (as shown in Figure 6). The *2022 Interim Review* assumed 2,132 MW.
- A total of 483 MW (summer capability) of proposed generation deactivations, as shown in Figure 7 (e.g., retirement, mothball, or ICAP-Ineligible Forced Outage (IIFO) or proposed to retire or mothball), as compared with 929 MW assumed for the *2022 Interim Review*. An additional 757 MW are operationally impacted by the Peaker Rule[6] promulgated by the New York State Department of Environmental Conversation (DEC) (as shown in Figure 8). Some of the units are assumed out of service only in the May-September ozone season consistent with their submitted compliance plans. The Peaker Rule impacts were also reflected in the *2022 Interim Review* models.

The NYSRC annually sets the IRM for the NYCA for the upcoming capability year. The current IRM[7] is set at 20% of the forecasted NYCA peak load for the 2023 – 2024 Capability Year (May 1, 2023, through April 30, 2024). The IRM meets NPCC's and NYSRC's resource adequacy criterion to plan for a LOLE of no greater than 0.1 event-days/year.

It should be noted that a new Capacity Accreditation method will apply to resources starting May 1, 2024, to value resources in the NYISO's Capacity Market based upon their marginal reliability impact on the system's ability to meet NYSRC's resource adequacy requirements. For this new methodology, the NYISO will be using the MARS models, which is also used to establish the IRM. As a result, the methodology will incorporate resource characteristics, such as, but not limited to, fuel source, availability, and energy duration limitations.

Additionally, the NYISO sets the LCRs for three New York localities. The LCRs for the 2023-2024 capability year are: 81.7% for Zone J, 105.2% for Zone K, and 85.4% for Zones G through J.[8] Based on the calculated LCRs, the NYISO establishes statewide and Locational Installed Capacity (ICAP) requirements for the Load Serving Entities. Figure 5 shows a comparison between the total capacity resources between this interim review and the most recent NYISO MARS planning models, which was also used for the 2022 interim review. Figure 6, Figure 7 and Figure 8 list the resource additions and removals assumed in the NYISO planning models.

[6] In 2020, the New York State Department of Environmental Conservation adopted a regulation to limit nitrogen oxides (NOx) emissions from simple-cycle combustion turbines ("Peaking Units") (referred to as the "Peaker Rule"). The Peaker Rule required all impacted plant owners to file compliance plans by March 2, 2020. The NYISO considered the affected generators' compliance plans in the development of the 2020 Reliability Needs Assessment Base Case, on which this Interim Review is also based.
[7] All values in the IRM calculation are based upon full installed capacity values of resources.
[8] https://www.nyiso.com/documents/20142/35886565/2023-LCR-Report.pdf

Figure 5: Comparison of Total Resource Assumptions (Summer MW Ratings)

Study Year	Capacity Resources (MW)*		Delta
	2022 Interim Review	2023 Interim Review	
2024	40,897	40,696	-201
2025	40,273	40,809	536
2026	41,977	42,206	229

* NYCA total capacity include resources electrically internal to NYCA, additions, reratings, and proposed deactivations (including proposed retirements, mothballs, and peaker rule impacts). Capacity values reflect the lesser of Capacity Resource Interconnection Service (CRIS) and Dependable Maximum Net Capability (DMNC) summer MW values from the Gold Book. NYCA resources include Special Resource Resources (SCRs) and also the net purchases and sales from the Gold Book. Net purchases and sales (transactions) include the election of Unforced Capacity Deliverability Rights (UDRs), External CRIS Rights, Existing Transmission Capacity for Native Load (ETCNL) elections, estimated First Come First Serve Rights (FCFSR), and grandfathered exports. Starting 2026, the proposed 1250 MW HVDC from Hydro Quebec into New York City is included in the summer calculation.

Figure 6: Generation Additions Assumed in this 2023 Interim Review

QUEUE POS.	OWNER / OPERATOR	STATION UNIT	ZONE	Proposed Date	SUMMER (MW)	UNIT TYPE
Large Gens						
396	Baron Winds, LLC	Baron Winds	C	Dec-24	117.0	Wind Turbines
495	Mohawk Solar LLC	Mohawk Solar	F	Apr-25	90.5	Solar
0505	Ball Hill Wind Energy, LLC	Ball Hill Wind	A	Jul-23	100.0	Wind Turbines
0531	Invenergy Wind Development LLC	Number 3 Wind Energy	E	Mar-23	103.9	Wind Turbines
0579	Bluestone Wind, LLC	Bluestone Wind	E	May-23	111.8	Wind Turbines
0612	South Fork Wind, LLC	South Fork Wind Farm	K	Aug-23	96.0	Wind Turbines
0617	Watkins Glen Energy Center, LLC	Watkins Glen Solar	C	Nov-24	50.0	Solar
0618	High River Energy Center, LLC	High River Solar	F	Apr-24	90.0	Solar
0619	East Point Energy Center, LLC	East Point Solar	F	Dec-23	50.0	Solar
629	Silver Lake Solar, LLC	Silver Lake Solar	C	Nov-24	24.9	Solar
0637	Flint Mine Solar LLC	Flint Mine Solar	G	Oct-24	100.0	Solar
0695	South Fork Wind, LLC	South Fork Wind Farm II	K	Aug-23	40.0	Wind Turbines
706	High Brigde Wind, LLC	High Brigde Wind	E	Nov-23	100.8	Wind Turbines
0720	Trelina Solar Energy Center, LLC	Trelina Solar Energy Center	C	Dec-24	79.8	Solar
0721	Excelsior Energy Center, LLC	Excelsior Energy Center	A	Feb-25	280.0	Solar
				LG	1,434.7	

Notes:
Small Gens with **Capacity Resources Interconnection Services (CRIS)** (or projected to obtain it) via Expedited Deliverability Study (EDS) or Class Year (CY) studies (only projects with CRIS rights these are in the MARS model)
included starting 2023 Reliability Planning Models, starting 2023 Q3 STAR
included starting 2022 RPP
also included in 2021 Reliability Planning Models, starting 2021 Q3 STAR
also included in the 2020 RPP
also included starting 2018 RPP Base Cases

QUEUE POS.	OWNER / OPERATOR	STATION UNIT	ZONE	Proposed Date (M-YY)	SUMMER (MW)	UNIT TYPE
Small Gens						
545	Sky High Solar LLC	Sky High Solar	C	Jun-23	20.0	Solar
564	Rock District Solar, LLC	Rock District Solar	F	Jul-24	20.0	Solar
565	Tayandenega Solar, LLC	Tayandenega Solar	F	Jun-24	20.0	Solar
570	Hecate Energy, LLC	Albany County	F	Mar-23	20.0	Solar
572	Hecate Energy Greene 1 LLC	Greene County 1	G	Jan-23	20.0	Solar
573	Hecate Energy Greene 2 LLC	Greene County 2	G	Mar-23	10.0	Solar
581	SED NY Holdings LLC	Hills Solar	E	Aug-23	20.0	Solar
584	SunEast Dog Corners Solar LLC	Dog Corners Solar	C	Apr-24	20.0	Solar
586	SunEast Watkins Road Solar LLC	Watkins Rd Solar	E	Jun-23	20.0	Solar
590	Duke Energy Renewables Solar, LLC	Scipio Solar	C	Dec-24	18.0	Solar
591	SunEast Highview Solar LLC	Highview Solar	C	Dec-24	20.0	Solar
592	SunEast 2021 Acqusition LLC	Niagara Solar	B	Jun-25	20.0	Solar
598	Hecate Energy, LLC	Albany County II	F	Mar-23	20.0	Solar
638	Pattersonville Solar Facility, LLC	Pattersonville	F	Oct-23	20.0	Solar
666	Martin Rd Solar LLC	Martin Rd Solar	A	Sep-23	20.0	Solar
667	Bakerstand Solar LLC	Bakerstand Solar	A	Oct-23	20.0	Solar
670	SunEast Skyline Solar LLC	Skyline Solar	E	Jul-23	20.0	Solar
730	Darby Solar, LLC	Darby Solar	F	Apr-23	20.0	Solar
734	ELP Ticonderoga Solar, LLC	ELP Ticonderoga Solar	F	Aug-24	20.0	Solar
735	ELP Stillwater Solar LLC	ELP Stillwater Solar	F	Oct-23	20.0	Solar
759	KCE NY 6, LLC	KCE NY 6	A	Jan-23	20.0	Energy Storage
807	SunEast Hilltop Solar LLC	Hilltop Solar	F	Jul-23	20.0	Solar
848	SunEast Fairway Solar LLC	Fairway Solar	E	Mar-25	20.0	Solar
855	Bald Mountain Solar LLC	NY 13 Solar	F	Nov-23	20.0	Solar
828	SunEast Valley Solar LLC	Valley Solar	C	Nov-24	20.0	Solar
832	Granada Solar, LLC	CS Hawthorn Solar	F	Feb-24	20.0	Solar
833	Dolan Solar, LLC	Dolan Solar	F	Sep-23	20.0	Solar
				SG	**528.0**	
				LG+SG	**1,962.7**	

Notes:
Small Gens with **Capacity Resources Interconnection Services (CRIS)** (or projected to obtain it) via Expedited Deliverability Study (EDS) or Class Year (CY) studies (only projects with CRIS rights these are in the MARS model)
included starting 2023 Reliability Planning Models, starting 2023 Q3 STAR
included starting 2022 RPP
also included in 2021 Reliability Planning Models, starting 2021 Q3 STAR
also included in the 2020 RPP
also included starting 2018 RPP Base Cases

Figure 7: Generation Deactivations Assumed in the NYISO's 2022 Reliability Needs Assessment (RNA) and this 2023 Interim Review

TABLE IV-5: Notices of Proposed Deactivations[1] as of March 15, 2023						
OWNER / OPERATOR	STATION UNIT	ZONE	DATE [2]	SUMMER CRIS (MW)	SUMMER CAPABILITY (MW)	Notes
Consolidated Edison Co. of NY, Inc.	74 St. GT 1	J	05/01/2023	19.0	18.5	3
Consolidated Edison Co. of NY, Inc.	74 St. GT 2	J	05/01/2023	20.1	19.3	3
Astoria Generating Company, L.P.	Astoria GT 01	J	05/01/2023	15.7	13.4	3
NRG Power Marketing LLC	Astoria GT 2-1	J	05/01/2023	41.2	34.9	3
NRG Power Marketing LLC	Astoria GT 2-2	J	05/01/2023	42.4	34.3	3
NRG Power Marketing LLC	Astoria GT 2-3	J	05/01/2023	41.2	36.3	3
NRG Power Marketing LLC	Astoria GT 2-4	J	05/01/2023	41.0	32.5	3
NRG Power Marketing LLC	Astoria GT 3-1	J	05/01/2023	41.2	34.6	3
NRG Power Marketing LLC	Astoria GT 3-2	J	05/01/2023	43.5	35.7	3
NRG Power Marketing LLC	Astoria GT 3-3	J	05/01/2023	43.0	33.9	3
NRG Power Marketing LLC	Astoria GT 3-4	J	05/01/2023	43.0	34.9	3
NRG Power Marketing LLC	Astoria GT 4-1	J	05/01/2023	42.6	33.6	3
NRG Power Marketing LLC	Astoria GT 4-2	J	05/01/2023	41.4	34.3	3
NRG Power Marketing LLC	Astoria GT 4-3	J	05/01/2023	41.1	35.4	3
NRG Power Marketing LLC	Astoria GT 4-4	J	05/01/2023	42.8	35.2	3
Helix Ravenswood, LLC	Ravenswood 10	J	05/01/2023	21.2	16.1	3
			Total	**580.4**	**482.9**	

1. Units listed in Table IV-5 have provided a notice to the NYSPSC and/or have a completed Generator Deactivation Notice with the NYISO.

2. This date refers to the proposed generator deactivation date stated in the generator deactivation notice.

3. This unit has also submitted a Peaker Rule compliance plan to the DEC.

Figure 8: Peaker Rule Compliance

TABLE IV-6: Proposed Status Change to Comply with DEC Peaker Rule [1]						
OWNER / OPERATOR	STATION UNIT	ZONE	DATE	SUMMER CRIS (MW)	SUMMER CAPABILITY (MW)	Notes
Central Hudson Gas & Elec. Corp.	Coxsackie GT	G	05/01/2023	21.6	19.0	2
Central Hudson Gas & Elec. Corp.	South Cairo	G	05/01/2023	19.8	18.7	2
National Grid	Northport GT	K	05/01/2023	13.8	8.3	2
National Grid	Port Jefferson GT 01	K	05/01/2023	14.1	13.0	2
National Grid	Shoreham 1	K	05/01/2023	48.9	41.3	2, 4
National Grid	Shoreham 2	K	05/01/2023	18.5	16.5	2, 4
National Grid	Glenwood GT 03	K	05/01/2023	54.7	49.9	2, 4
Consolidated Edison Co. of NY, Inc.	59 St. GT 1	J	05/01/2025	15.4	13.1	2
NRG Power Marketing, LLC	Arthur Kill GT 1	J	05/01/2025	16.5	12.3	2
Astoria Generating Company, L.P.	Gowanus 2-1 through 2-8	J	05/01/2025	152.8	142.1	3
Astoria Generating Company, L.P.	Gowanus 3-1 through 3-8	J	05/01/2025	146.8	136.9	3
Astoria Generating Company, L.P.	Narrows 1-1 through 2-8	J	05/01/2025	309.1	285.9	3
			Total	**832.0**	**757.0**	

1. Units listed have not provided a notice to the NYSPSC or completed a Generator Deactivation Notice with the NYISO.

2. These units have indicated they will be out of service as noted in their compliance plans in response to the DEC Peaker Rule.

3. These units have indicated they will be out of service during the ozone season (May through September) in their compliance plans in response to the DEC Peaker Rule.

4. Long Island Power Authority (LIPA) has submitted notifications to the DEC per Part 227-3 of the Peaker Rule, stating that these units are needed for reliability allowing these units to continue operating until at least May 1, 2025.

Transmission

Transmission will play a key role in moving power from the renewable resources to the load centers.

Planned transmission projects are included in the base case if (1) the project was selected by the NYISO as a regulated transmission solution or (2) the project has completed necessary interconnection studies and siting applications and is making significant progress in construction, project financing, and/or regulatory approvals. [9] Planned additions to the New York transmission system include the following (included in the 2022 RNA and the subsequent 2023 STAR base cases), some of which are shown on the Figure 9:

- **December 2023: LS Power and New York Power Authority (NYPA) Segment A, AC Transmission joint project** was selected by the NYISO Board of Directors in April 2019. The project includes a new double-circuit 345 kV line between Edic and New Scotland substations, two new 345 kV substations at Princetown and Gordon Road (near Rotterdam), two new 345 kV lines between Princetown to Gordon Road substations, and retirement of the existing Porter to Rotterdam 230 kV lines. The planned in-service date is December 2023.
- **December 2023: New York Transco Segment B, AC Transmission project** was selected by the NYISO Board of Directors in April 2019. The project includes a new double-circuit 345/115 kV line from a new Knickerbocker 345 kV switching station to the existing Pleasant Valley substation, 50% series compensation on the Knickerbocker to Pleasant Valley 345 kV line, and retirement of 115 kV lines between Greenbush and Pleasant Valley substations. These projects target completion of the majority of the components by December 2023.
- **December 2025: NYPA/National Grid's Northern New York Priority Transmission Project** is expected to increase the capacity of transmission lines in northern New York, where significant wind and hydro capacity exists and constraints on existing lines contribute to curtailment of these resources. The planned in-service date is December 2025.
- **May 2026: Champlain Hudson Power Express (CHPE)** 1,250 MW HVDC project from Quebec to Astoria Annex 345 kV in New York City (Zone J), awarded under NYSERDA's Tier 4 REC program. The facility is expected to provide capacity in the summer but not in the winter. The planned in-service date is spring 2026.
- **Transmission Owner Local Transmission Plans (LTPs)** that meet the inclusion rules:
  - **Summer 2023:**
    - Orange & Rockland: Lovett 345/138 kV substation.
    - Con Edison: A new (2nd) 345/138 kV PAR controlled 138 kV Rainey – Corona feeder.
    - Short-Term Reliability Process solution for addressing the 2023 Short-Term Reliability Need identified in the 2020 Quarter 3 STAR. The solution changed the planned operating status of existing series reactors, starting in summer

[9] NYISO Reliability Planning Process Manual, Section 3.2, dated December 12, 2019.

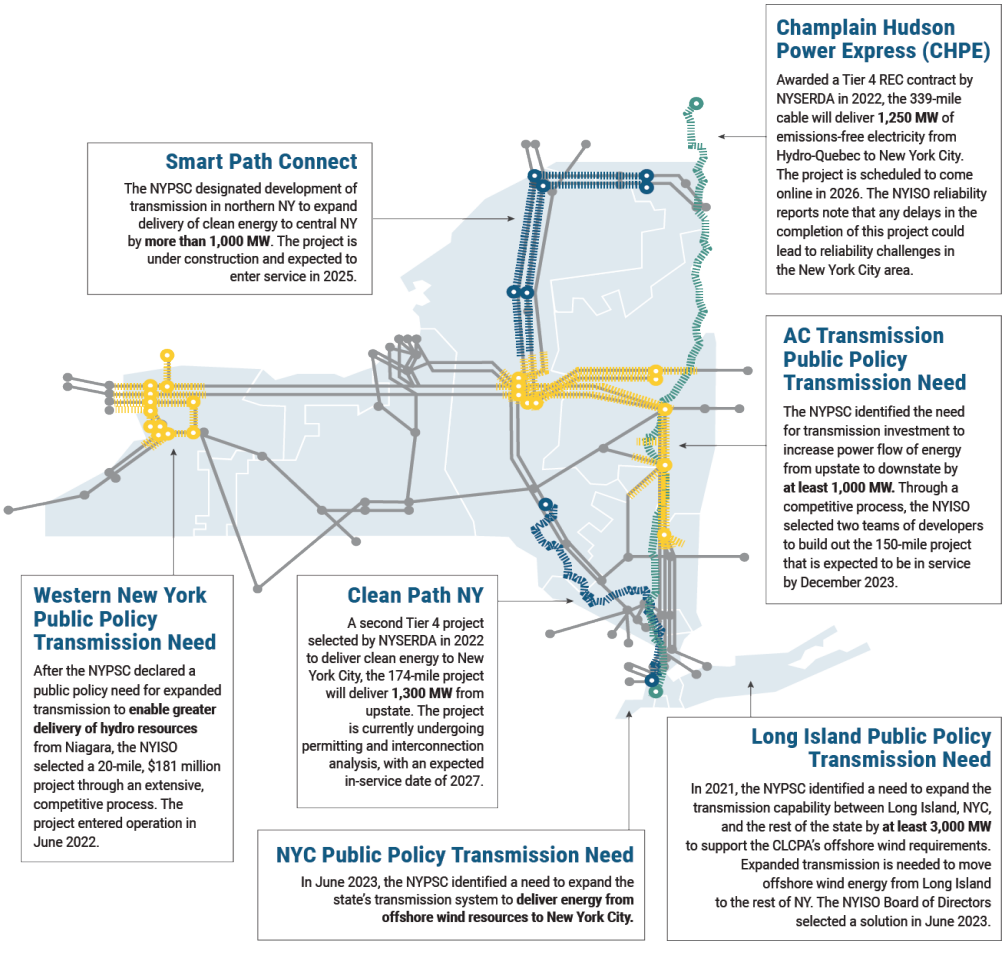
2023:

- In-service, starting summer 2025: series reactors on the following Con Edison 345 kV cables: 71, 72, M51, M52.
- Bypass, starting summer 2025: series reactors on the following Con Edison 345 kV cables: 41, 42, Y49.

- **Summer 2025:**
  - Con Edison: A new (3rd) 345/138 kV PAR controlled 138 kV Gowanus – Greenwood feeder.
  - Con Edison: A new 345/138 kV PAR controlled 138 kV Goethals – Fox Hills feeder.

The NYISO continues to track other transmission projects that are in conceptual and engineering stages of development, some of which are shown in the Figure 9 below, as well as in the 2023 Gold Book.

Figure 9: Public Policy Planning Major Projects



Source: NYISO's 2023 Power Trends

Figure 10: Transmission Additions Assumed in the NYISO's 2022 RNA and this 2023 Interim Review *(Other than LTPs)*

S.	OWNER / OPERATOR	STATION UNIT	ZONE	Proposed Date (M-YY)	SUMMER (MW)	TYPE	Interconnection Status
Proposed Transmission (nonLTP)							
0543	National Grid, NY Transco, O&R, ConEdison	ACPPTPP Segment B Knickerbocker-Pleasant Valley 345 kV	F,G	12/2023	*n/a*	AC Transmission	TIP Interconnection Agreement completed
0556	LS Power, National Grid, NYPA	ACPPTPP Segment A Edic - New Scotland 345kV	E, F	12/2023	*n/a*	AC Transmission	
0631	CHPE LLC	NS Power Express	J	05/2026	1000	DC Transmission	CY21 completed
0887	CHPE LLC	CH Uprate			+250		
631/887 ESUF	NYPA	Astoria Annex - Rainey 345 kV	J	12/2026	n/a	AC Transmission Undergroubd Cable	CY 2021 Q631/887 Elective SUF
1125	NYPA, National Grid	Northern New York Priority Transmission Project	D, E	winter 2025	n/a	AC Transmission	TIP Facility Study completed

Notes:
included starting 2022 RPP
also included in the 2020 RPP

Gas Infrastructure

New York's reliance on natural gas as the primary fuel for electric generation justifies continued vigilance regarding the status of the natural gas system. The NYISO is actively involved in natural gas/electric coordination efforts with New York State and federal regulators, pipeline owners, generator owners, local distribution companies, and neighboring Independent System Operators and Regional Transmission Operators.

The NYISO's efforts with respect to gas supply assurance focus on: (1) improving communication and coordination between the gas and electric sectors; (2) annual, weekly and, when conditions warrant, *ad hoc* generator surveys of fuel supplies to enhance awareness in the control room and provide electric system reliability benefits; and (3) addressing the electric system reliability impact of the sudden catastrophic loss of gas.

In addition, the NYSRC has a minimum oil-burn requirement rule for New York City and Long Island that is intended to maintain electric system reliability in the event of gas supply interruptions: the two areas have a loss of gas supply dual-fuel requirement and certain combined cycle gas units participate in the "Minimum Oil Burn" program. While oil accounts for a relatively small percentage of the total energy production in New York, it is often called upon to fuel generation during critical periods, such as when severe cold weather limits access to natural gas.

Extreme Weather

The dangers of severe weather impacting the grid have been exemplified around the country in the past year, with Texas experiencing a brutal polar vortex in February and California facing problems from extreme heat last summer. New York is not immune from such extreme weather, which could lead to greater electrical demand and more forced generator outages than currently accounted for in the baseline forecasts. Prior to each summer and winter, the NYISO presents a capacity assessment to gauge the margins available for the upcoming season in consideration of such plausible system conditions.[10]

The NYSRC has established goals for 2023 and beyond to identify the needed actions to preserve New York reliability for extreme weather events and other extreme system conditions. The NYISO supports refining the reliability rules and models to better represent fuel shortage conditions, as well as to allow for planning for sudden loss of fuel (e.g., wind) and designing the system for the peak load conditions from extreme weather such as heat waves (e.g., 90/10 forecast). Additionally, the NYISO is working toward exploring ways to reflect potential winter peak and cold snaps gas shortages in the resource adequacy models used for both planning and capacity markets evaluations, and how to account for growing forecast uncertainty in the future years due to electrification.

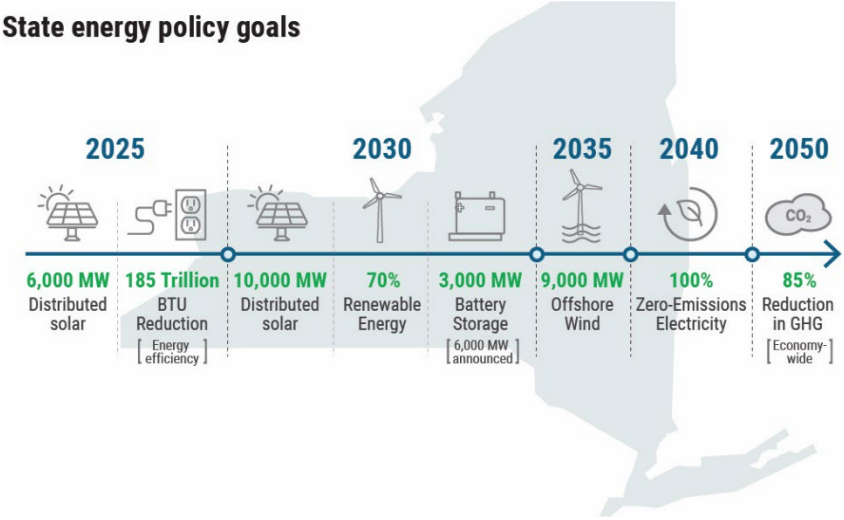
Environmental Initiatives and Other Regulatory Activities

New York's climate goals continue to impact the electric system in profound ways. State and local requirements have created what are arguably the most aggressive energy and environmental policies in the nation. The question of how to maintain system reliability on the road to meeting the state's decarbonization goals has become a central issue in planning for the system.

[10] https://www.nyiso.com/documents/20142/20968296/2021%20Summer%20Capacity%20Assessment%20-%20Updated%20Version.pdf

The CLCPA targets include:

- 185 trillion BTU reduction (energy efficiency) by 2025
- 6,000 MW of distributed solar PV by 2025
- 10,000 MW distributed solar by 2030
- 3,000 MW of energy storage by 2030
- 70% renewable energy by 2030
- 9,000 MW of offshore wind by 2035
- 100% zero-emissions electricity by 2040
- 85% reduction in Greenhouse Gas Emissions by 2050



Additional details on the CLCPA can be found at https://climate.ny.gov/ and here www.nyserda.ny.gov.

At the end of 2022, the New York's Climate Action Council approved the Final Scoping Plan outlining recommendations for the State to achieve the emissions reductions called for by the CLCPA. The plan lays out programs and regulatory initiatives to decarbonize the economy through electrification of the building and transportation sectors, creating significant but uncertain implications for the future demand for electricity. As an overarching recommendation, the Final Scoping Plan called for development of a New York Cap-and-Invest program to price greenhouse gas emissions into nearly all sectors of New York's economy. DEC and NYSERDA are in the process of developing three regulations this year: the Cap-and-Invest, Mandatory Reporting, and Auction Rules. Together the regulations will put a statewide limit on greenhouse gas emissions and auction allowances to the market, enforcing the statewide limit and generating revenues to support clean energy and consumer rebate programs.

Figure 11 summarizes key environmental regulations and energy policies that the NYISO considers in planning for the system.

Figure 11: Summary Table of Key Environmental Regulations and Energy Policies

Public Policy Initiative	Policy Goal	Policy Implications
Climate Leadership and Community Protection Act (CLCPA)	Overarching goal to reduce New York's greenhouse gas emissions by 40% of 1990 levels by 2030 and 85% by 2050. Includes many power sector targets including: 10,000 MW of distributed solar installed by 2030; 3,000 MW of storage installed by 2030, with an announced goal of 6,000 MW by 2030; 70% of load supplied by renewable resources by 2030; 9,000 MW of offshore wind installed by 2035; and 100% of load supplied by zero-emissions resources by 2040. Formation of the Climate Action Council to develop a Final Scoping Plan to inform regulations and programs to achieve CLCPA economy-wide decarbonization goals. Environmental Justice and Just Transition policy goals.	Transformation of the economy to one powered primarily by electricity as a form of overall emissions reduction. A central pillar in this approach is the power grid, necessitating examination of market structures, planning processes, flexible load, and investment in bulk power system infrastructure. Electrification of building and transportation sectors will increase load substantially and impact when it is in most demand. Identification of future generation resources with potential to achieve policy goals while maintaining electric system reliability will be necessary. Modeling platforms and metrics need to be updated and improved to capture more dynamic, weather dependent systems.
"Peaker Rule:" Ozone Season Oxides of Nitrogen (NOx) Emission Limits for Simple Cycle and Regenerative Combustion Turbines	Reduce ozone-precursor nitrogen oxide emissions associated with New York State-based peaking unit generation during the May-September ozone season. Compliance obligations phased in between May 2023 and May 2025. To aid system planners, generators submit compliance plans to the DEC outlining the compliance approach for each unit before the initial compliance date. For units identified as needed for reliability, the rule allows for several years of extended operations.	DEC rule impacts approximately 3,300 MW of peaking unit capacity in New York State, primarily in New York City and Long Island. The NYISO analyzes compliance plans through its Reliability Planning Process (RPP) to determine whether the plans trigger reliability needs that must be addressed with solutions to maintain system reliability.
New York Power Authority Small Gas Power Plant Phase Out	Advance decarbonization date of seven NYPA small natural gas plants to 2030.	Impacts 517 MW nameplate capacity in New York City and Long Island. Requires plan to phase out production of electricity from fossil fuels, considering clean replacement resources and impacts on emissions and system reliability.
Clean Energy Standard (CES)	Predated by the Renewable Portfolio Standard, and now aligned with the CLCPA targets, the CES requires utilities procure Renewable Energy Credits (RECs) and Zero Emission Credits (ZECs) from eligible generators to support clean electricity content requirements. NYSERDA administers the CES through regular REC solicitation and tracking initiatives while the PSC provides oversite to these programs.	Eligible renewable resources are supported through various Tiers.: Tier 1 RECs support new renewable resources, Tier 2 supports pre-2015 resources, Tier 4 supports development of transmission to deliver RECS into New York City, and offshore wind RECs (ORECs) to support the state's offshore wind targets. ZECs support upstate nuclear generators. RECs and ZECs represent the environmental attributes associated with one MWh of eligible generation.
NYS Accelerated Renewable Energy Growth and Community Benefit Act (AREA)	Provides for an accelerated path for the permitting and construction of renewable energy projects, calls for a comprehensive study to identify cost-effective electric system upgrades, and to file the study with the New York State Public Service Commission. Allows the PSC to designate priority transmission projects. NYSERDA administers a Build Ready program which supports development of brownfield and other industrial sites.	Establishes new transmission investment priorities to facilitate the achievement of state policies, including through the use of NYISO's Public Policy Planning Process. The PSC oversees a coordinated planning process among the utilities to identify local transmission and distribution upgrades throughout the state. Following this process $4.2B+ in local transmission and distribution upgrades and
New York City Residual Oil Elimination	Eliminate combustion of fuel oil numbers 6 and 4 in New York City by 2020 and 2025, respectively. Rule allows additional compliance pathway allowing for direct conversion directly to fuel oil number 2 by 2023.	The rule impacts 2,946 MW of generation in New York City Affected generators have taken steps to convert their facilities to comply with the law.
New York City Local Law 97	Requires greenhouse gas emissions from covered buildings be reduced by 40% by 2030 and 80% by 2050. Compliance under the program begins in 2024,	Mandate applies to any building in NYC larger than 25,000 square feet; the law was updated in 2020 to include buildings in which up to 35% of units are rent regulated, starting in 2026. Officials estimate the law would apply to roughly 40,000 of the city's more than one million buildings, representing nearly 60% of in-city building area. Emissions reduction strategies will be driven by electrification which increase demand for clean electricity.
Proposed Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants	The federal Environmental Protection Agency (EPA) has proposed regulations to reduce carbon dioxide emissions from new and existing fossil fuel-fired generation.	Requires states submit plans limiting CO_2 emissions from affected existing generators. For large, frequently operated existing CC, and coal units operating into the 2040's, 90% emission reductions are required during the 2030's. Generators may retire or limit operations to be categorized to receive less stringent requirements.

Results

General Electric's Multi-Area Reliability Simulation (GE-MARS) is the computer software program used for probabilistic analysis by the NYISO.

LOLE is generally defined as the expected (weighted average) number of days in a given period (e.g., one study year) when for at least one hour from that day the hourly demand is projected to exceed the zonal resources (event day). Within a day, if the zonal demand exceeds the resources in at least one hour of that day, this will be counted as one event day. The criterion is that the LOLE cannot exceed one event-day in 10 years, or LOLE < 0.1 days/year. LOLE accounts for events but does not account for the magnitude (MW) or duration (hours) of the deficit. Therefore, two additional reliability indices are added for information purposes: loss of load hours (LOLH) described in hours per year and expected unserved energy (EUE) described in MWh per year.[11]

LOLH is generally defined as the expected number of hours per period (e.g., one study year) when a system's hourly demand is projected to exceed the zonal resources (event hour). Within an hour, if the zonal demand exceeds the resources, this will be counted as one event hour.

EUE, also referred to as loss of energy expectation (LOEE), is generally defined as the expected energy (MWh) per period (e.g., one study year) when the summation of the system's hourly demand is projected to exceed the zonal resources. Within an hour, if the zonal demand exceeds the resources, this deficit will be counted toward the system's EUE.

While the resource adequacy reliability criterion of 0.1 days/year established by the NPCC and the NYSRC is compared with the loss of load expectation (LOLE in days/year) calculation, currently there is no criterion for determining a reliable system based on the LOLH and EUE reliability indices.

Figure 12 summarizes the NYCA LOLE results by comparing the 2021 Comprehensive and the *2022 Interim Review* results with this *2023 Interim Review* for the base case (baseline demand) and the high demand forecast case results. **NYCA LOLE is below its 0.1 event-days/year criterion throughout the 2024-2026 study period; therefore, this 2023 Interim Review finds that the NYCA, as planned, complies with the NPCC resource adequacy criterion under the Base Case (baseline) forecasted system demand in normal weather.** Risk factors such as delayed implementation of projects in the plan, higher load forecast, additional generator deactivations, unplanned outages, and extreme weather could potentially lead to deficiencies in reliable electric service in the coming years.

Scenarios such as the High Demand Forecast, are simulated for information only and for identification

[11] NYSRC's "Resource Adequacy Metrics and their Application," available at https://www.nysrc.org/PDF/Reports/Resource%20Adequacy%20Metric%20Report%20Final%204-20-2020[6431].pdf.

of future, potential risks.

Figure 12: NYCA LOLE Results (event-day/year): Comparison with the Prior Studies

	NYCA LOLE Baseline Demand Forecast			NYCA LOLE High Demand Forecast		
Study Year	2021 Comprehensive	2022 Interim Review	2023 Interim Review	2021 Comprehensive	2022 Interim Review	2023 Interim Review
2024	0.041	0.018	0.025	0.097	0.039	0.033
2025	0.044	0.024	0.034	0.147	0.068	0.053
2026	0.046	0.004	0.018	0.175	0.027	0.037

Figure 13 table below summarizes the baseline demand forecast, projected resources and the NYCA LOLE results for the remaining study period of this assessment. The LOLE is below its 0.1 event-days/year criterion. The NYCA LOLE decreased in 2026 mainly due to the inclusion of the 1,250 MW proposed HVDC line from Hydro Quebec into New York City, having a targeted in-service date of May 2026.

Figure 13: Summary of 2023 Interim Review NYCA LOLE Results, Load, and Resources

Baseline Load, Resources Totals, and LOLE Results			
	2024	2025	2026
Baseline Load Forecast (MW)	32,280	32,390	32,440
Projected Resources (MW)	40,696	40,809	42,206
Projected Resources/Baseline Load Ratio*	126.1%	126.0%	130.1%
LOLE Results (event-days/year)	0.025	0.034	0.018

Note: * 2023-2024 Capability Year IRM is 20%. The IRM is established each year for the upcoming Capability Year with 2024-2025 IRM in progress.

While there currently is no reliability criteria for the LOLH and EUE reliability indices, the table below provides a summary of the results, for information purposes.

Figure 14: Summary of NYCA LOLH (event-hour/year) and EUE (MWh/year) Results

Reliability Indices			
Study Year	LOLE (days/year)	LOLH (hours/year)	EUE (MWh/year)
2024	0.025	0.059	22.2
2025	0.034	0.089	45.6
2026	0.018	0.039	12.8

While this 2023 Interim Review finds that the NYCA, as planned, complies with the NPCC resource adequacy criterion as discussed above, the NYISO's 2023 Q2 STAR,[12] published on July 14, 2023, identified an actionable Near-Term Reliability Need beginning in summer 2025 within New York City. This reliability need is based on a deficient transmission security margin that accounts for expected generator availability, transmission limitations, and updated demand forecasts using data published in the 2023 Load & Capacity Data Report. This need will be addressed under the NYISO's STRP.

In addition to the studies and reviews detailed herein, the NYSRC, in collaboration with the NYISO, annually establishes an IRM for the following Capability Year. The IRM established for the 2023-2024 Capability Year is 20% of the forecasted load. The process that will establish the IRM for the 2024-2025 capability year is targeted to conclude in December 2023.

Conclusion

This *2023 Interim Review* finds that the NYCA will comply with the NPCC resource adequacy criterion under the Base Case (baseline) peak demand forecast. The NYCA LOLE baseline results from this Interim Review are higher when compared with the 2022 Interim Review results. The difference is mainly due to a higher forecast and less available resources.

Comparing the Interim Review's LOLE results for the baseline from study year 2022 to study year 2023, the higher NYCA LOLE is due to, among other things, the impacts of planned generator deactivations in response to the impacts of the DEC's Peaker Rule beginning in 2023. However, the drop in the LOLE in 2026 is primarily due to the inclusion of the proposed 1,250 MW (summer) HVDC from Hydro Quebec into New York City (for winter it was assumed at zero MW).

The NYISO continuously plans its system to address potential reliability needs through its biennial Reliability Planning Process (RPP) and its Short-Term Reliability Process (STRP), which includes an assessment of changes on a quarterly basis for, among other things, generators seeking to deactivate. The RPP evaluates changes to the system from year 4 to year 10 of the ten-year study period, and the STRP evaluates year 1 through year 5 from the Short-Term Assessment of Reliability (STAR) Start Date, with a focus on short-term reliability needs arising in years 1 through 3 of the study period. In the event that there is a need, the NYISO will seek market-based and regulated solutions to address the need through the RPP or STRP, depending on the nature of the need. As a last resort to a need identified through the STRP, the NYISO may enter into Reliability Must Run agreements with specific generators to continue to operate until market-based projects or permanent transmission solutions are built. Moreover, the NYISO continuously monitors all planned projects and any changes to the New York State transmission system

[12] NYISO's 2023 Q2 STAR Report, available at https://www.nyiso.com/documents/20142/16004172/2023-Q2-STAR-Report-Final.pdf.

and may request solutions outside of its normal planning cycles if there appears to be an imminent threat to the reliability of the bulk power transmission system arising from causes other than deactivating generation.

The wholesale electricity markets administered by the NYISO are also an important tool to mitigate these risks. These markets are designed, and continue to evolve and adapt, to send appropriate price signals for new market entry and retention of resources that assist in maintaining reliability. The potential risks may be resolved by new capacity resources coming into service, construction of additional transmission facilities, and/or increased energy efficiency, integration of distributed energy resources, and growth in demand response participation. The NYISO will continue to monitor these and other developments to determine whether changing system resources and conditions could impact the reliability of the New York Bulk Power System.