New York ISO
Independent System Operator

NPCC 2025 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 2026-2029

Approved by the NPCC RCC on December 1, 2025

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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 *2024 Comprehensive Review of Resource Adequacy* (2024 Comprehensive Review) covered the five-year study period of 2025-2029. This *2025 Interim Review of Resource Adequacy* (2025 Interim Review) report provides the first of two interim assessments of the NYISO's *2024 Comprehensive Review* covering the remaining three years of the study period (i.e., from 2026 through 2029), and it is based on the NYISO's 2025 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 2026 to 2029.

Introduction

The *2025 Interim Review* provides the first of two updates to the *2024 Comprehensive Review.* The *2024 Comprehensive Review* was based on the NYISO's 2024 reliability planning MARS models assumptions (such as information from the *2024 Load & Capacity Data Report* or *Gold Book*) and was approved by NPCC RCC on December 3, 2024. Since the approval of the *2024 NPCC Comprehensive Review*, the NYISO has conducted additional resource adequacy assessments as part of the current 2024-2025 cycle of the Reliability Planning Process (RPP)[1] 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 2025-2026 capability year is 24.4% 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.

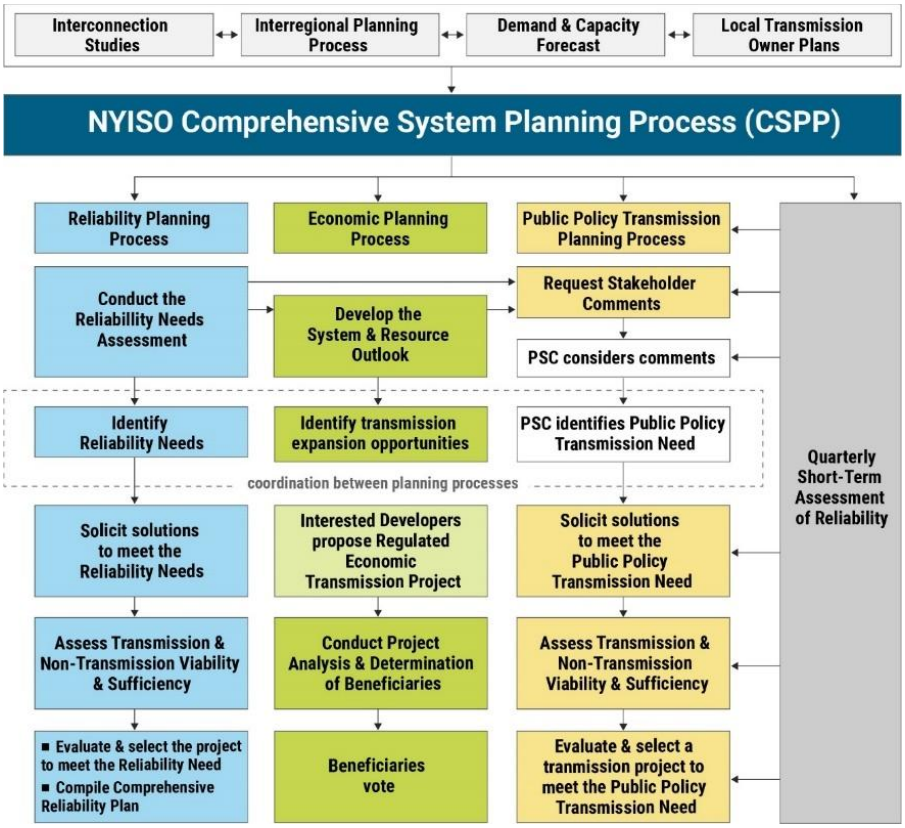
The major assumptions of this *2025 Interim Review* are consistent with the NYISO's 2025 reliability planning MARS models and inclusion rules application.

A visual depiction of the NYISO's Comprehensive System Planning Process is in Figure 1 below. The NYISO's Comprehensive Reliability Planning Process[2] includes biennial reliability planning reports focused on identifying and resolving Bulk Power Transmission Facilities (BPTF) reliability needs in years 4 through 10 of the planning horizon 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) for the year 1 through 5 of the study period, 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 resulting from system changes that are not related to a generator deactivation.

[1] NYISO's 2024 Reliability Needs Assessment ("RNA"), *available at* https://www.nyiso.com/documents/20142/2248793/2024-RNA-Report.pdf/0fe6fd1e-0f28-0332-3e80-28bea71a2344.

[2] 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: [

Figure 1: NYISO's Comprehensive System Planning Process



Major Assumption and Changes

Demand Model

The 2025 Gold Book[3] 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 *2024 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 efficiency initiatives and the growth of distributed BTM energy resources, such as solar PV. These impacts

[3] NYISO's 2025 Load and Capacity Data (Gold Book), available at: [link]

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 five-year annual average energy (+1.4%) and summer peak demand (+0.9%) growth rates are higher than last year (the 2024 forecasted values: five-year annual average energy (+0.8%) and the summer peak demand (+0.5%) growth rates). Increases in growth rates relative to the prior forecast are primarily attributed to the significant impacts of interconnecting large load projects. Baseline energy and coincident peak demand increase significantly throughout the 30-year 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.

The load model that the NYISO uses in the planning model for General Electric's Multi-Area Reliability Simulation (GE-MARS) 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 MARS model are 2013, 2017, and 2018, chosen based on detailed analysis of about 20 years of data, performed by the NYISO.[4]

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 2025 Gold Book Higher Demand Scenario forecast with energy efficiency impacts backed down to baseline forecast levels.

Figure 2 below shows a comparison of the baseline summer and winter peak demand forecast used in the 2025 Interim Review and the 2024 Comprehensive Review.

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 the baseline forecast.

[4] Additional details are included in the March 24, 2022 LFTF/TPAS/ESPWG presentations, which are available at [link]: 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.

Figure 2: Comparison of Baseline Summer and Winter Peak Demand Forecasts

Summer Baseline Forecast (MW)			
Study Year	2024 Compr. Review	2025 Interim Review	Delta *(current - past)*
2026	31,900	31,990	*90*
2027	32,110	32,280	*170*
2028	32,130	32,410	*280*
2029	32,340	32,620	*280*

Winter Baseline Forecast (MW)			
Study Year	2024 Compr. Review	2025 Interim Review	Delta *(current - past)*
2025-26	24,210	24,200	*-10*
2026-27	24,730	24,920	*190*
2027-28	25,270	25,330	*60*
2028-29	25,760	25,850	*90*

Figure 3: 2025 Gold Book - Summary of NYCA Baseline Summer Coincident Peak Demand Forecasts – MW

Summary of NYCA Baseline Summer Coincident Peak Demand Forecasts - MW

Year	(a) Econometric Peak Demand	(b) (-) EE and C&S	(c) (-) Solar PV, BTM	(d) (-) Non-Solar DG, BTM	(e) (-) BTM Storage Peak Reductions	(f) (+) EV Peak Demand	(g) (+) Building Electrification	(h) (+) Large Load Projects	(i) =a-b-c-d-e+f+g+h Baseline Summer Peak Forecast	(j) Forecast Prior to Large Load Growth
2026	33,640	729	1,657	354	281	270	78	1,023	31,990	31,433
2027	33,965	1,108	1,688	356	347	354	131	1,329	32,280	31,417
2028	34,175	1,481	1,683	365	412	489	187	1,500	32,410	31,376
2029	34,367	1,851	1,655	372	468	629	252	1,718	32,620	31,368

Summary of NYCA Baseline Winter Coincident Peak Demand Forecasts - MW

Year	(a) Econometric Peak Demand	(b) (-) EE and C&S	(c) (-) Solar PV, BTM	(d) (-) Non-Solar DG, BTM	(e) (-) BTM Storage Peak Reductions	(f) (+) EV Peak Demand	(g) (+) Building Electrification	(h) (+) Large Load Projects	(i) =a-b-c-d-e+f+g+h Baseline Winter Peak Forecast	(j) Forecast Prior to Large Load Growth
2025-26	24,011	249	0	342	224	405	121	478	24,200	24,200
2026-27	24,182	590	0	354	281	508	360	1,095	24,920	24,303
2027-28	24,266	880	0	356	347	635	665	1,347	25,330	24,461
2028-29	24,387	1,164	0	365	412	823	1,014	1,567	25,850	24,761

Error! Not a valid bookmark self-reference. below compares the baseline with the high demand forecasts for summer and winter.

Figure 4: Comparison of High Demand vs Baseline Summer Peak Demand Forecasts

2025 Demand Forecasts (MW)			
Study Year	**Baseline Demand**	**High Demand**	***Delta (High-Base)***
Summer			
2026	31,990	32,590	*600*
2027	32,280	33,450	*1,170*
2028	32,410	34,060	*1,650*
2029	32,620	34,670	*2,050*
Winter			
2025-26	24,200	24,350	*150*
2026-27	24,920	25,640	*720*
2027-28	25,330	26,630	*1,300*
2028-29	25,850	27,760	*1,910*

Figure 5 : Comparison of High Load 2024 vs 2025

High Load Forecast (MW)			
Study Year	**2024 Compr. Review**	**2025 Interim Review**	**Delta (current vs past)**
Summer			
2026	32,910	32,590	-320
2027	33,450	33,450	0
2028	33,940	34,060	120
2029	34,400	34,670	270
Winter			
2025-26	24,960	24,350	-610
2026-27	25,790	25,640	-150
2027-28	26,690	26,630	-60
2028-29	27,610	27,760	150

Resources

For this review, resource assumptions are based upon the 2025 summer capability of generation resources in New York as reported in the *2025 Gold Book*. Resources values in Figure 6 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 planning 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. While the NYISO Interconnection Queue contains an unprecedented number of proposed projects in various stages of development, the NYISO's inclusion rules often result in only limited amounts of generation and transmission projects being included in the base case. 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 *2025 Interim Review* assumes:

- A total of about 4,404 MW (summer capability) of proposed generation projects, mainly wind and solar (as shown in Figure 7). The *2024 Comprehensive Review* assumed 2,821 MW.
- A total of 763 MW (summer capability) of proposed generation deactivations, as shown in Figure 8 (e.g., retirement, mothball, or ICAP-Ineligible Forced Outage (IIFO) or proposed to retire or mothball), as compared with 735 MW assumed for the *2024 Comprehensive Review*.

The NYSRC annually sets the IRM for the NYCA for the upcoming capability year. The current IRM[5] is set at 24.4% of the forecasted NYCA peak load for the 2025 – 2026 Capability Year (May 1, 2025, through April 30, 2026). 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.

Starting May 1, 2024, the NYISO has been applying a new Capacity Accreditation method 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 methodology, the NYISO will be using the MARS models, which are 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 2025-2026 capability year are: 78.5% for Zone J, 106.5% for Zone K, and 78.8% for Zones G through J.[6] Based on the calculated LCRs, the NYISO establishes statewide and Locational Installed Capacity (ICAP) requirements for the Load Serving Entities. Figure 6 shows a comparison between the total capacity resources between this interim review and the most recent NYISO MARS planning model. Figure 7, Figure 8, and

[5] All values in the IRM calculation are based upon full installed capacity values of resources.
[6] 2025-2026 LCR Report

Figure 9 list the resource additions and removals assumed in the NYISO planning models.

Figure 6: Comparison of Total Resource Assumptions (Summer MW Ratings)

Capacity Resources (MW)*			
Study Year	2024 Compr. Review	2025 Interim Review	Delta (current vs past)
2026	42,606	42,081	-525
2027	43,728	45,823	2,096
2028	43,728	46,204	2,476
2029	43,728	46,204	2,476

* 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 Case 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 1,250 MW HVDC from Hydro Quebec into New York City is included in the summer calculation.

Figure 7: Generation Additions Assumed in this 2025 Interim Review

Large Generators

Queue	Project Name	MW	Type	Zone	Proposed Date
396	Baron Winds Phase II	117	Wind	C	Dec-25
571	Heritage Wind, LLC	200	Wind	B	Sep-26
596	Alle Catt II Wind + Hillside PAR NUF	339	Wind	A	Dec-26
704	Bear Ridge Solar	100	Solar	A	Apr-27
720	Trelinia Solar Energy Center	80	Solar	C	Apr-28
721	Excelsior Energy Center	280	Solar	B	Nov-26
737	Empire Wind 1	816	Wind	J	Dec-26
811	Hecate Energy Cider Solar LLC	500	Solar	B	Dec-26
880	Brookside Solar	100	Solar	D	May-28
883	Garnet Energy Center, LLC	200	Solar	B	Apr-28
950	Hemlock Ridge Solar	200	Solar	B	May-27
1079	Somerset Solar	125	Solar	A	Mar-27
766/987	Sunrise I, II Wind LLC	924	Wind	K	Jul-27
	LG	**3,981**			

Small Generators

Queue	Project Name	MW	Type	Zone	Proposed Date
545	Sky High Solar	20	Solar	C	Jun-25
564	Rock District Solar	20	Solar	F	Feb-27
572	Greene County 1	20	Solar	G	May-25
573	Greene County 2	10	Solar	G	May-25
581	Hills Solar	20	Solar	E	Dec-26
584	Dog Corners Solar	20	Solar	C	Apr-26
586	Watkins Rd Solar	20	Solar	E	Jul-26
590	Scipio Solar	18	Solar	C	Dec-26
591	Highview Solar	20	Solar	C	Feb-25
592	Niagara Solar	20	Solar	A	Dec-26
734	Ticonderoga Solar	20	Solar	F	Dec-26
804	KCE NY 10	20	Energy Storage	A	Oct-26
827	Arthur Kill Energy Storage 1	15	Energy Storage	J	Sep-25
828	Valley Solar	20	Solar	C	Nov-24
832	CS Hawthorn Solar	20	Solar	F	Dec-26
833	Dolan Solar	20	Solar	F	Dec-26
848	Fairway Solar	20	Solar	E	Mar-25
855	NY13 Solar	20	Solar	F	Jun-25
865	Flat Hill Solar	20	Solar	E	Dec-25
885	Grassy Knoll Solar	20	Solar	E	Dec-25
1003	Clear View Solar	20	Solar	C	Dec-25
1047	Millers Grove Solar	20	Solar	E	Dec-26
	SG	**423**			
	SG + LG	**4,404**			

Figure 8: Generation Deactivations Assumed in the 2025 Interim Review

Notices of Proposed Deactivations[1] as of March 15, 2025								
OWNER / OPERATOR	STATION UNIT	ZONE	DATE [2]	SUMMER CRIS (MW)	WINTER CRIS (MW)	SUMMER CAPABILITY (MW)	WINTER CAPABILITY (MW)	Notes
National Grid	Shoreham 2	K	05/01/2025	18.5	23.5	16.7	21.3	3
Astoria Generating Company, L.P.	Astoria GT 01	J	05/01/2025	15.7	20.5	13.8	18.0	3
Central Hudson Gas & Elec. Corp.	Coxsackie GT	G	05/31/2026	21.6	26.0	19.7	25.2	3
Madison Windpower, LLC	Madison Windpower	E	05/01/2025	11.5	11.5	11.6	11.6	
				67.3	**81.5**	**61.8**	**76.1**	

Notes:
1. Units listed in the table have provided a notice to the NYPSC and/or have a completed Generator Deactivation Notice with the NYISO.
2. This date refers to the proposed generator deactivation date stated in the submitted Generator Deactivation Notice submitted to the NYISO.
3. This unit has also submitted a Peaker Rule compliance plan to the DEC.

Figure 9: Peaker Rule and CLCPA Compliance

Potential Generator Status Changes to Comply with State Rules and Climate Policy [1]									
OWNER / OPERATOR	STATION UNIT	ZONE	DATE	NAMEPLATE RATING (MW)	SUMMER CRIS (MW)	WINTER CRIS (MW)	SUMMER CAPABILITY (MW)	WINTER CAPABILITY (MW)	Notes
Deactivations within interim study period 2026-2029									
National Grid	Shoreham 1	K	05/01/2023	52.9	48.9	63.9	46.0	50.7	2, 4
National Grid	Glenwood GT 03	K	05/01/2023	55.0	54.7	71.5	54.1	66.6	2, 4
NRG Power Marketing, LLC	Arthur Kill GT 1	J	05/01/2025	20.0	16.5	21.6	12.4	16.1	2
Astoria Generating Company, L.P.	Gowanus 2-1 through 2-8	J	05/01/2025	160.0	152.8	199.6	142.2	182.5	3
Astoria Generating Company, L.P.	Gowanus 3-1 through 3-8	J	05/01/2025	160.0	146.8	191.7	140.2	180.1	3
Astoria Generating Company, L.P.	Narrows 1-1 through 2-8	J	05/01/2025	352.0	309.1	403.6	288.3	372.5	3
				Total	**728.8**	**951.9**	**683.2**	**868.5**	

Notes:

1. This table includes the potential status changes of units to comply with DEC Peaker Rule and laws and policies related to the Climate Leadership and Community Protection Act. 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. To address the Need identified in the 2023 Q2 STAR, the NYISO designated the generators on the Gowanus 2 & 3 and Narrows 1 & 2 barges to temporarily remain in operation after the DEC Peaker Rule compliance date (May 1, 2025) until permanent solutions to the Need are in place, for an initial period of up to two years (May 1, 2027).

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 operate as directed by PSEG Long Island, until at least May 1, 2025

Transmission

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

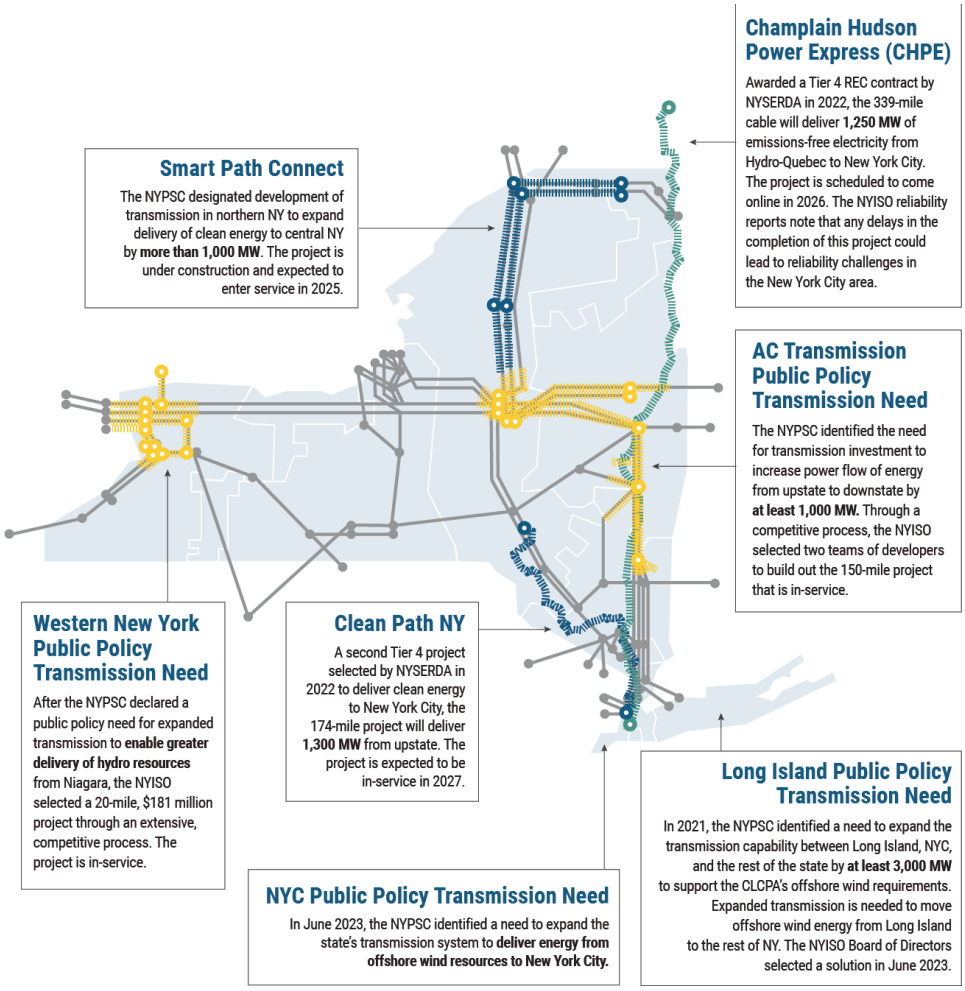
Planned transmission projects are included in the base case if (1) the project was selected by the NYISO as a regulated transmission solution or (2) the project has completed necessary interconnection studies and siting applications and is making significant progress in construction, project financing, and/or regulatory approvals. [7] There is no major new transmission project included in this Interim Review as compared with the Comprehensive review. Planned additions to the New York transmission system include the following (included in the 2025 RPP and the subsequent 2025 STAR base cases), some of which are shown on the Figure 10:

- Empire State Line project was selected through the Public Policy Transmission Planning Process to address the Western NY Public Policy Transmission Need and entered service in 2020.
- Central East Energy Connect and New York Energy Solution were selected through the Public Policy Transmission Planning Process to address the AC Transmission Segment A and Segment B Public Policy Transmission Needs and entered service in 2024;
- Local Transmission Owner Plans designated as "firm" by the Transmission Owner and included in the NYISO 2025 Gold Book, with consideration for in-service date,
- Champlain-Hudson Power Express 1,250 MW HVDC line from Hydro-Québec to New York City, with a May 2026 in-service date;
- NYPA and New York Transco, LLC jointly proposed the Propel NY Energy project that is being developed through the NYISO's Public Policy Transmission Planning Process. The project adds three new AC tie lines between Long Island and the rest of New York and a 345 kV backbone across western/central Long Island that has an in-service date in 2030 (outside of this Interim study period).
- NYPA/National Grid's Northern New York Priority Transmission Project increases the capacity of transmission lines in northern New York and is expected to be in service in 2026.
- Con Edison's proposed Brooklyn Clean Energy Hub project, including a new 345 kV load serving substation with the goal of addressing local electric reliability needs in the boroughs of Brooklyn and Queens, as well as the goal of serving as a point of interconnection for new clean-energy resources. The targeted in-service date for the Brooklyn Clean Energy Hub project is summer 2028.

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 10 below, as well as in the 2025 Gold Book.

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

Figure 10: Public Policy Planning Major Projects



Source: NYISO's 2025 Power Trends

Note: the Clean Path and NYC Public Policy Transmission Need projects identified in the figure above are not included in the reliability planning models, while all of the other projects are included in the models.

Figure 11: Transmission Additions Assumed in the NYISO's 2025 RPP and this 2025 Interim Review *(Other than LTPs)*

Proposed Transmission (non LTP)

Queue	Project Name	MW	Type	Zone	Proposed Date	Interconnection Status
631/887	TDI Champlain Hudson Power Express (CHPE)	1250	HVDC	J	May-26	IA complete
1125	Northern New York Priority Transmission Project (NNYPTP)	N/A	Multiple AC	D&E	Dec-25	Accepted cost allocation
1289	Propel NY Energy - Alternate Sol 5 (T051 LIPPTN)	N/A	Multiple AC	I,J,K	May-30	SIS complete

Summary of Key MARS Modeling Changes

Starting with the 2024 RNA, the reliability planning models reflected several changes highlighted below (additional details in Appendix A of this report):

- Modified assumptions to account for winter uncertainties:
  - Dynamic LFU: on the demand side, increasing winter peak load forecast uncertainty (throughout the study years) was modeled to account for the impacts of heating electrification, EV charging, and large loads; and
  - Winter gas unavailability: on the resources side, assumed the risk of gas unavailability mainly related with gas-only plants.
- New data sources: using 5 years of hourly MW model-based data developed by DNV-GL for land-based and offshore wind, and front-of-the- meter solar.
- Further limiting external reliance: the top 5 (changed from 3 starting 2024 RNA as an additional method to further limit reliance) summer and winter peak load days of an external Control Area are modeled as coincident with the NYCA top five peak load days.
- SCR model: modeled as duration-limited resources with units being constrained to be called once in a day when a loss of load event occurs.
- Large loads: certain proposed large loads were assumed flexible and will decrease demand on peak days, as shown in the Gold Book[8] Table I-14. This was modeled in MARS as an EOP step before the SCR step.

[8] 2025 NYISO Gold Book: https://www.nyiso.com/documents/20142/2226333/2025-Gold-Book-Public.pdf

Additionally, starting with the 2025 reliability planning models,[9] the NYISO assumed:

- 10 years of cable outage data (rather than five years of data), and
- Reduced the Quebec to Chateaugay emergency assistance import limit in winter to zero for a more conservative assumption.

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.

The NYISO also performed assessments in 2019 and 2023 to examine the fuel and energy security of the New York electric grid for a forward-looking period and identify any potential problems or concerns. The assessments provided information regarding similar fuel and energy security initiatives underway in neighboring markets. The results of the assessments are intended to help facilitate and inform the development of recommendations for any necessary market or operational enhancements related to fuel and energy security. A few observations from the 2023 Fuel and Energy Security Study are listed below:

- Over the longer term, the projected magnitude and pace of change to the resource fleet stemming from requirements under the CLCPA grows in importance;
- The NYISO continues to take many steps to address potential risks associated with fuel and energy security concerns;

[9] MARS v5.7.3765 was used.

- Dual-fuel capability of generator (i.e., with oil as a backup fuel to natural gas) is vital for maintaining reliability during the ongoing system transition; and
- Continuous updating and refinement of fuel and energy security modeling

An emergency communications protocol is in place to communicate electric reliability concerns to pipelines and gas LDCs during tight electric operating conditions in addition to a cooperative process with interstate pipelines and LDCs for providing OFOs and other Critical Notice information to the NYISO.

NYSRC, which establishes rules used to assess grid reliability, identified the need to model winter operations under conditions in which generators have limited access to natural gas. A new rule, adopted in May 2024, requires the modeling of future winter system operations under reasonably expected conditions. The rule is reflected in the findings of the NYISO's 2024 RNA. In this report, the system was modeled with the assumption that 6,400 megawatts (MW) of gas-only generation will be out-of-service during winter peak conditions due to supply disruptions and system constraints. This assumption contributes to the forecasted narrowing of reliability margins across the RNA's study horizon.

In November 2023, NPCC launched a Northeast Gas/Electric System Study to support evaluation of the resilience of gas pipeline and storage infrastructure to serve gas-fired generation during the winter peak heating season in the long-range planning and operations planning timeframes. NPCC selected Levitan & Associates, Inc. to conduct the analysis with the NYISO, ISO-NE, Northeast Gas Association (NGA), and the Local Distribution Companies (LDCs) participating in this study. In the study, the consultant examines the gas supply and pipeline constraints that may occur during extreme winter weather events during the peak heating season, December through February. The Study Region was defined as New York and New England. Three winters are examined: 2024/25, 2027/28 and 2032/33. The study concluded that the gas and electric system modeling confirms that the region's natural gas infrastructure is fully or near fully utilized during periods of extreme cold weather. Though gas supplies are limited during cold weather and oil shares the load following burdens, during milder conditions the interstate gas pipeline system can accommodate larger hourly ramps that will be needed to balance the grid as more renewable resources come online. The full report on this study was published in January 2025 and can be accessed at [link].

Extreme Weather

The dangers of severe weather impacting the grid have been exemplified around the country in the past year. 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 NYISO operates under the most stringent reliability rules in the nation. The NYISO's long-range reliability planning requires examination of the reliability of the system using scenarios, such as extreme weather events and unexpected transmission failures. The NYISO's reliability planning studies indicate that system margins are expected to narrow to such a level that warrants review of current reliability rules, procedures, and practices.

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 NYSRC approved new reliability rules that the NYISO implemented first in its 2024 RNA. These rules allow for representing fuel shortage as system condition, as well as allow for planning for sudden loss of fuel (*e.g.,* gas) as a contingency. Additionally, under the 2024 RNA, the NYISO explored ways to reflect potential winter peak and cold snaps gas shortages in the resource adequacy models used for planning evaluations (*i.e.,* modeling additional non-firm gas-only unavailability when the demand is above the baseline winter forecast) and how to account for growing forecast uncertainty in the future years due to electrification (*i.e.,* by modeling a dynamic LFU for winter to account for uncertainty due electrification and large loads).

Other efforts are undergoing at the NERC level to define extreme weather requirements.

Environmental Initiatives and Other Regulatory Activities

New York State's climate goals continue to impact the electric system in profound ways. State and local requirements have created energy and environmental policies that are shaping investments in the grid. However, a central issue for the NYISO in planning for the system is maintaining system reliability as New York State continues on the road to meet the state's decarbonization goals.

[10] 2025 Summer Capacity Assessment

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 www.nyserda.ny.gov.

At the end of 2022, the New York State Climate Action Council approved the Final Scoping Plan outlining recommendations for New York 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: 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 12 summarizes key environmental regulations and energy policies that the NYISO considers in planning for the system.

Figure 12: 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 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

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 13 summarizes the NYCA LOLE results by comparing the *2024 Comprehensive* and the *2025 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 2026-2029 study period; therefore, this *2025 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. 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 13: NYCA LOLE Results (event-day/year): Comparison with the Prior Studies

	NYCA LOLE for the Baseline Demand Forecast Models		NYCA LOLE for the High Demand Forecast Models	
Study Year	2024 Compr. Review	2025 Interim Review	2024 Compr. Review	2025 Interim Review
2026	0.010	0.015	0.021	0.026
2027	0.008	0.007	0.027	0.022
2028	0.006	0.009	0.035	0.036
2029	0.009	0.010	0.063	0.073

Figure 14 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.

Figure 14: Summary of 2025 Interim Review NYCA LOLE Results, Load, and Resources

Baseline Load, Resources Totals, and LOLE Results				
	2026	2027	2028	2029
Baseline Load Forecast (MW)	31,990	32,280	32,410	32,620
Projected Resources (MW)	42,081	45,823	46,204	46,204
Projected Resources/Baseline Load Ratio*	132%	142%	143%	142%
LOLE Results (event-days/year)	0.015	0.007	0.009	0.010

Notes:

* 2025-2026 Capability Year IRM is 24.4%. The IRM is established each year for the upcoming Capability Year with 2026-2027 IRM in progress.

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 Case 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 1,250 MW HVDC from Hydro Quebec into New York City is included in the summer calculation.

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)
2026	0.015	0.036	8.4
2027	0.007	0.016	4.4
2028	0.009	0.021	5.0
2029	0.010	0.025	6.7

While not a resource adequacy need, it is noteworthy to mention that there was a transmission security margin need identified first in the 2023 Q2 STAR, and subsequent quarterly STAR report, that the NYISO has been planning for by retaining several existing units until a permanent solution is available.

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 2025-2026 Capability Year is 24.4% of the forecasted load. The process that will establish the IRM for the 2026-2027 capability year is targeted to conclude in December 2025.

Conclusion

This *2025 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 generally higher when compared with the 2024 Comprehensive Review results. The difference is mainly due to a higher forecast.

Comparing the Interim Review's LOLE results for the baseline from study year 2026 to study year 2027, the lower NYCA LOLE is due to, among other things, the impacts of planned generator additions, despite the increasing demand forecast.

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

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.

Appendix A

2024 RNA and 2025 RPP MARS Assumptions Matrix

	Parameter	2024 RNA Base Cases Key Assumptions (2024 Gold Book)	2025 RPP, 2025 Q3 STAR Key Assumptions (2025 GB)
Load Parameters			
1	**Peak** Load Forecast	Adjusted 2024 Gold Book NYCA baseline peak load forecast. It includes large loads from the NYISO interconnection queue, with forecasted impacts. Baseline load represents coincident summer peak demand and includes the reductions due to projected energy efficiency programs, building codes and standards, BtM storage impacts at peak, distributed energy resources and BtM solar photovoltaic resources; it also reflects expected impacts (increases) from projected electric vehicle usage and electrification. The 2024 GB baseline peak load forecast includes the impact (reduction) of behind-the-meter (BtM) solar at the time of NYCA peak. For the BtM Solar adjustment, gross load forecasts that include the impact of the BtM generation are used for the 2024 RNA, which then allows for a discrete modeling of the BtM solar resources using 5 years of inverter data.	Adjusted 2025 Gold Book NYCA baseline peak load forecast. It includes large loads from the NYISO interconnection queue, with forecasted impacts. Baseline load represents coincident summer peak demand and includes the reductions due to projected energy efficiency programs, building codes and standards, BtM storage impacts at peak, distributed energy resources and BtM solar photovoltaic resources; it also reflects expected impacts (increases) from projected electric vehicle usage and electrification. The 2025 GB baseline peak load forecast includes the impact (reduction) of behind-the-meter (BtM) solar at the time of NYCA peak. For the BtM Solar adjustment, gross load forecasts that include the impact of the BtM generation are used for the 2025 RPP, which then allows for a discrete modeling of the BtM solar resources using 5 years of inverter data.
1a	Proposed large loads	As included in the Baseline Peak Load Forecast from the Gold Book. Certain large loads that are assumed flexible (e.g., crypto, hydrogen) are modeled as EOP step.	As included in the Baseline Peak Load Forecast from the Gold Book. Certain large loads that are assumed flexible (e.g., crypto, hydrogen) are modeled as EOP step.
2	Load **Shapes** (Multiple Load Shapes)	Used Multiple Load Shape MARS Feature *(see March 24, 2022 LFTF/ESPWG).* 8,760-hour historical gross load shapes were used as base shapes for LFU bins: Load Bins 1 and 2: 2013 Load Bins 3 and 4: 2018 Load Bins 5 to 7: 2017 Historical load shapes are adjusted to meet zonal (as well as G-J) coincident and non-coincident peak forecasts (summer and winter), while maintaining the energy targets. For the BtM Solar discrete modeling, gross load forecasts that include the impact of the BtM generation are used (additional details under the BtM Solar category below).	Used Multiple Load Shape MARS Feature *(see March 24, 2022 LFTF/ESPWG).* 8,760-hour historical gross load shapes were used as base shapes for LFU bins: Load Bins 1 and 2: 2013 Load Bins 3 and 4: 2018 Load Bins 5 to 7: 2017 Historical load shapes are adjusted to meet zonal (as well as G-J) coincident and non-coincident peak forecasts (summer and winter), while maintaining the energy targets. For the BtM Solar discrete modeling, gross load forecasts that include the impact of the BtM generation are used (additional details under the BtM Solar category below).
3	Load Forecast Uncertainty (LFU) The LFU model captures the impacts of weather conditions on future loads.	Same summer LFU values as the ones presented in 2023 *(as presented at the May 26, 2023 LFTF [link] and also presented at the April 18, 2024 LFTF [link])* **New Additional Method for Winter:** **Winter Dynamic Load Forecast Uncertainty (LFU)**: In order to reflect uncertainty stemming from electrification, electric vehicles (EVs), and large loads, the 2024 RNA will use a winter LFU multipliers model. Over the study period year 2 through year 10, dynamic winter LFU multipliers were calculated, reflecting the increasing share and load behavior of EV charging load, heating electrification, and large load projects. The dynamic winter LFU multipliers increase over the study horizon, reflecting the increasing winter weather sensitivity due to additional EV charging and electric heating load. Note: the first winter of the study period (winter 2024-25) match those calculated using recent winter load and weather data.	Same summer LFU values as the ones presented in 2023 *(as presented at the May 26, 2023 LFTF [link] and also presented at the April 18, 2024 LFTF [link])* **Starting 2024 RNA, winter Dynamic Load Forecast Uncertainty (LFU)**: In order to reflect uncertainty stemming from electrification, electric vehicles (EVs), and large loads, starting with the 2024 RNA used a winter LFU multipliers model. Over the study period year 2 through year 10, dynamic winter LFU multipliers were calculated, reflecting the increasing share and load behavior of EV charging load, heating electrification, and large load projects. The dynamic winter LFU multipliers increase over the study horizon, reflecting the increasing winter weather sensitivity due to additional EV charging and electric heating load. Note: the first winter of the study period (winter 2024-25) match those calculated using recent winter load and weather data.

	Parameter	2024 RNA Base Cases Key Assumptions (2024 Gold Book)	2025 RPP, 2025 Q3 STAR Key Assumptions (2025 GB)
		Additional details are available in the April 18 TPAS/ESPWG/LFTF presentation [link]	Additional details are available in the May 29 TPAS/ESPWG/LFTF presentation [link]
Generation Parameters			
1	**Existing** Generating Unit Capacities (*e.g., thermal units, large hydro)*	2024 Gold Book values: Summer is min of (DMNC, CRIS). Winter is min of (DMNC, CRIS). Adjusted for RNA Base Case inclusion rules application	2025 Gold Book values: Summer is min of (DMNC, CRIS). Winter is min of (DMNC, CRIS). Adjusted for RNA Base Case inclusion rules application
2	**Proposed New Units Inclusion** Determination	2024 Gold Book with RNA Base Case inclusion rules applied	2025 Gold Book with RNA Base Case inclusion rules applied
3	Retirement, Mothballed Units, IIFO	2024 Gold Book with RNA Base Case inclusion rules applied	2025 Gold Book with RNA Base Case inclusion rules applied
4	Forced and Partial Outage Rates (*e.g., thermal units)*	Five-year (2019-2023) GADS data for each unit represented. Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period. For new units or units that are in service for less than three years, NERC 5-year class average EFORd data are used.	Five-year (2020-2024) GADS data for each unit represented. Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period. For new units or units that are in service for less than three years, NERC 5-year class average EFORd data are used.
5	Modeling of Non-firm Gas Unavailability During Winter Peak Conditions	**New:** In order to simulate anticipated risks from cold snaps on the gas availability, gas plants available MWs in NYCA are further derated, *i.e.,* all gas-only units with non-firm gas within the NYCA are assumed unavailable**.** Also, certain dual-fuel units with duct-burn capability are derated. The forecasted winter coincident peak is used to determine when the gas derates are applied in the RNA Base Cases and for each load bin and Study Year.	**Starting 2024 RNA:** In order to simulate anticipated risks from cold snaps on the gas availability, gas plants available MWs in NYCA are further derated, *i.e.,* all gas-only units with non-firm gas within the NYCA are assumed unavailable**.** Also, certain dual-fuel units with duct-burn capability are derated. The forecasted winter coincident peak is used to determine when the gas derates are applied in the RNA Base Cases and for each load bin and Study Year.
6	Daily Maintenance	Fixed maintenance based on schedules received by the NYISO.	Fixed maintenance based on schedules received by the NYISO.
7	Weekly Planned Maintenance	MARS is automatically scheduling maintenance based on NYCA capacity and demand. Data: 5y (2019-2023) of historical scheduled maintenance data from Operations and GADS system to determine the number of weeks on maintenance for each thermal unit.	MARS is automatically scheduling maintenance based on NYCA capacity and demand. Data: 5y (2020-2024) of historical scheduled maintenance data from Operations and GADS system to determine the number of weeks on maintenance for each thermal unit.
8	Summer Maintenance	None	None
9	Combustion Turbine Derates	Derate based on temperature correction curves. Thermal derates are based on a ratio of peak load before LFU is applied and LFU applied load. For new units: used data for a unit of same type in same zone, or neighboring zone data.	Derate based on temperature correction curves. Thermal derates are based on a ratio of peak load before LFU is applied and LFU applied load. For new units: used data for a unit of same type in same zone, or neighboring zone data.

	Parameter	2024 RNA Base Cases Key Assumptions (2024 Gold Book)	2025 RPP, 2025 Q3 STAR Key Assumptions (2025 GB)
10	Existing Landfill Gas (LFG) Plants	Actual hourly plant output over the last 5 years. Program randomly selects an LFG shape of hourly production over the last 5 years for each model replication. Probabilistic model is incorporated based on five years of input shapes, with one shape per replication randomly selected in the Monte Carlo process.	Actual hourly plant output over the last 5 years. Program randomly selects an LFG shape of hourly production over the last 5 years for each model replication. Probabilistic model is incorporated based on five years of input shapes, with one shape per replication randomly selected in the Monte Carlo process.
11	Existing and Proposed **Wind** Units	**New data source:** Model-based hourly data over the available past 5 years (2017-2021 developed by DNV-GL). For any unit that was included in the DNV data the data "as is" was used. For any unit not included a weighted zonal average was modeled. Probabilistic model is incorporated based on five years of input shapes with one shape per replication being randomly selected in Monte Carlo process.	**Starting 2024 RNA, new data source:** Model-based hourly data over the available past 5 years (2020-2024 developed by DNV-GL). For any unit that was included in the DNV data the data "as is" was used. For any unit not included a weighted zonal average was modeled. Probabilistic model is incorporated based on five years of input shapes with one shape per replication being randomly selected in Monte Carlo process.
12	Proposed **Offshore Wind** Units	RNA Base Case inclusion rules Applied to determine the generator status. **New data source:** 5 years of hourly model-based data as developed by DNV-GL (2017-2021)	RNA Base Case inclusion rules Applied to determine the generator status. 5 years of hourly model-based data as developed by DNV-GL (2020-2024)
13	Existing and Proposed **Utility-scale Solar Resources**	**New data source:** Probabilistic model chooses from the model-based data shapes covering past available 5 years (2017-2021), as developed by DNV-GL. One shape per replication is randomly selected in Monte Carlo process.	Probabilistic model chooses from the model-based data shapes covering past available 5 years (2020-2024), as developed by DNV-GL. One shape per replication is randomly selected in Monte Carlo process.
14	**BtM Solar Resources**	**Supply side:** Past five years (2017-2021) of 8,760 hourly MW profiles based on sampled inverter data. The MARS random shape mechanism randomly picks one 8,760 hourly shape (of five) for each replication year; similar with the past planning modeling and aligns with the method used for wind, utility solar, landfill gas, and run-of-river facilities. **Load side:** Gross load forecasts	**Supply side:** Past five years (2020-2024) of 8,760 hourly MW profiles based on sampled inverter data. The MARS random shape mechanism randomly picks one 8,760 hourly shape (of five) for each replication year; similar with the past planning modeling and aligns with the method used for wind, utility solar, landfill gas, and run-of-river facilities. **Load side:** Gross load forecasts
15	Existing **BTM-NG Program**	These units are former load modifiers that sell capacity into the ICAP market. Modeled as cogen type 1 (or type 2 as applicable) unit in MARS. Unit capacity set to CRIS value, load modeled with weekly pattern that can change monthly.	These units are former load modifiers that sell capacity into the ICAP market. Modeled as cogen type 1 (or type 2 as applicable) unit in MARS. Unit capacity set to CRIS value, load modeled with weekly pattern that can change monthly.
16	Existing **Small Hydro** Resources (*e.g.,* run of river)	Actual hourly plant output over the past 5 years period. Program randomly selects a hydro shape of hourly production over the 5-year window for each model replication. The randomly selected shape is multiplied by their current nameplate rating.	Actual hourly plant output over the past 5 years period. Program randomly selects a hydro shape of hourly production over the 5-year window for each model replication. The randomly selected shape is multiplied by their current nameplate rating.
17	Existing **Large Hydro**	Probabilistic Model based on 5 years of GADS data. Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period. Methodology consistent with thermal unit transition rates.	Probabilistic Model based on 5 years of GADS data. Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period. Methodology consistent with thermal unit transition rates.
18	Proposed front-of-meter **Battery Storage**	GE MARS 'ES' model is used. Units are given a maximum capacity, maximum stored energy, and a dispatch window.	GE MARS 'ES' model is used. Units are given a maximum capacity, maximum stored energy, and a dispatch window.

	Parameter	2024 RNA Base Cases Key Assumptions (2024 Gold Book)	2025 RPP, 2025 Q3 STAR Key Assumptions (2025 GB)
19	Existing Energy Limited Resources (**ELRs)**	GE developed MARS functionality to be used for ELRs. Resource output is aligned with the NYISO's peak load window when most loss-of-load events are expected to occur.	GE developed MARS functionality to be used for ELRs. Resource output is aligned with the NYISO's peak load window when most loss-of-load events are expected to occur.
Transaction – Imports/ Exports			
1	Capacity Purchases	Grandfathered Rights and other awarded long-term rights Modeled using MARS explicit contracts feature.	Grandfathered Rights and other awarded long-term rights Modeled using MARS explicit contracts feature.
2	Capacity Sales	These are long-term contracts filed with FERC. Modeled using MARS explicit contracts feature. Contracts sold from ROS (Zones: A-F). ROS ties to external pool are derated by sales MW amount	These are long-term contracts filed with FERC. Modeled using MARS explicit contracts feature. Contracts sold from ROS (Zones: A-F). ROS ties to external pool are derated by sales MW amount
3	FCM Sales	Model sales for known years Modeled using MARS explicit contracts feature. Contracts sold from ROS (Zones: A-F). ROS ties to external pool are derated by sales MW amount	Model sales for known years Modeled using MARS explicit contracts feature. Contracts sold from ROS (Zones: A-F). ROS ties to external pool are derated by sales MW amount
4	UDRs	Updated with most recent elections/awards information (VFT, HTP, Neptune, CSC) Added CHPE HVDC (from Hydro Quebec into Zone J) at 1250 MW (summer only) starting 2026.	Updated with most recent elections/awards information (VFT, HTP, Neptune, CSC) Added CHPE HVDC (from Hydro Quebec into Zone J) at 1250 MW (summer only) starting 2026.
5	External Deliverability Rights (EDRs)	Cedars Uprate 80 MW. Modeled reflecting External CRIS rights.	Cedars Uprate 80 MW. Modeled reflecting External CRIS rights.
6	Wheel-Through Contract	300 MW HQ through NYISO to ISO-NE. Modeled as firm contract; reduced the transfer limit from HQ to NYISO by 300 MW and increased the transfer limit from NYISO to ISO-NE by 300 MW.	300 MW HQ through NYISO to ISO-NE. Modeled as firm contract; reduced the transfer limit from HQ to NYISO by 300 MW and increased the transfer limit from NYISO to ISO-NE by 300 MW.
MARS Topology: a simplified bubble-and-pipe representation of the transmission system			
1	Interface Limits	Developed by review of previous studies and specific analysis prior and during the RNA study process.	Developed by review of previous studies and specific analysis prior and during the RNA study process. **Starting with the 2025 models, Chateaugay to NY limit set to zero for winter.**
2	New Transmission	Based on TO-provided firm plans via Gold Book/LTP 2024 processes) and proposed merchant transmission and public policy facilities meeting the RNA Base Case inclusion rules.	Based on TO-provided firm plans (via Gold Book/LTP 2025 processes) and proposed merchant transmission and public policy facilities meeting the Base Case inclusion rules.
3	AC Cable Forced Outage Rates	All existing cable transition rates updated with data received from ConEd and PSEG-LIPA to reflect most recent five-year history.	All existing cable transition rates updated with data received from ConEd and PSEG-LIPA to reflect most recent ten-year history.
4	UDR unavailability	Five-year history of forced outages.	Ten-year history of forced outages.

	Parameter	2024 RNA Base Cases Key Assumptions (2024 Gold Book)	2025 RPP, 2025 Q3 STAR Key Assumptions (2025 GB)
Emergency Operating Procedures (EOPs)			
1	EOP Steps Order	**New order, and new flexible large loads at step 2:** 1. No EOP Support 2. Flexible Large Loads (400-900 MW) 3. Special Case Resources (SCRs) (Load and Generator) 4. 5% Manual Voltage Reduction 5. 30-Minute Operating Reserve to Zero (655 MW) 6. Voluntary Load Curtailment 7. Public Appeals 8. 5% Remote Controlled Voltage Reduction 9. Emergency Assistance from External Areas 10. Part of the 10-Minute Operating Reserve (910 MW of 1310 MW) to Zero	**Starting 2024 RNA, new EOP order and flexible large loads:** 1. No EOP Support 2. Flexible Large Loads (about 485 MW at max) 3. Special Case Resources (SCRs) (Load and Generator) 4. 5% Manual Voltage Reduction 5. 30-Minute Operating Reserve to Zero (655MW) 6. Voluntary Load Curtailment 7. Public Appeals 8. 5% Remote Controlled Voltage Reduction 9. Emergency Assistance from External Areas 10. Part of the 10-Minute Operating Reserve (910 MW of 1310 MW) to Zero
2	Special Case Resources (SCR)	SCRs sold for the program discounted to historic availability ("effective capacity"). Monthly variation based on historical experience. Summer values calculated from the latest available July registrations (July 2023 SCR enrollment) held constant for all years of study. **New Method:** SCRs are modeled as duration-limited resources. The duration limited units are constrained to be called once in a day when a loss of load event occurs, and are invoked between 5 and 7 hours (defined by zone), which is determined based on historical SCR performance in the applicable zone. Hourly response rates are used. The contribution by the SCRs vary monthly by applicable zone. These monthly values are also derived from historical performance of the SCRs. Additional details in the January 3, 2024 ICS/ICAP presentation [link] and May 1, 2024 ICS [link].	SCRs sold for the program discounted to historic availability ("effective capacity"). Monthly variation based on historical experience. Summer values calculated from the latest available July registrations (July 2024 SCR enrollment) held constant for all years of study. **Starting 2024 RNA, new method:** SCRs are modeled as duration-limited resources. The duration limited units are constrained to be called once in a day when a loss of load event occurs, and are invoked between 5 and 7 hours (defined by zone), which is determined based on historical SCR performance in the applicable zone. Hourly response rates are used. The contribution by the SCRs vary monthly by applicable zone. These monthly values are also derived from historical performance of the SCRs. Additional details in the January 3, 2024 ICS/ICAP presentation [link] and May 1, 2024 ICS [link].
3	EDRP Resources	Not modeled if the values are less than 2 MW.	Not modeled if the values are less than 2 MW.
4	Operating Reserves	655 MW 30-min reserve to zero 910 MW (of 1310 MW) 10-min reserve to zero Note: the 10-min reserve modeling method is updated per NYISO's recommendation (approved at the Oct. 3, 2023 NYSRC ICS [link]) to maintain (or no longer deplete/use) 400 MW of the 1,310 MW 10-min operating reserve at the applicable EOP step. Therefore, the 10-min operating reserve MARS EOP step will use, as needed each MARS replication: 910 MW (=1,310 MW–400 MW).	655 MW 30-min reserve to zero 910 MW (of 1310 MW) 10-min reserve to zero Note: the 10-min reserve modeling method is updated per NYISO's recommendation (approved at the Oct. 3, 2023 NYSRC ICS [link]) to maintain (or no longer deplete/use) 400 MW of the 1,310 MW 10-min operating reserve at the applicable EOP step. Therefore, the 10-min operating reserve MARS EOP step will use, as needed each MARS replication: 910 MW (=1,310 MW–400 MW).
5	Other EOPs *(e.g., manual voltage reduction, voltage curtailments, public appeals, external assistance, as listed above)*	Based on TO information, measured data, and NYISO forecasts. Will use 2024 elections, as available.	Based on TO information, measured data, and NYISO forecasts. Will use 2024 elections, as available.

	Parameter	2024 RNA Base Cases Key Assumptions (2024 Gold Book)	2025 RPP, 2025 Q3 STAR Key Assumptions (2025 GB)
External Control Areas Modeling Assumptions • External models (NE, HQ, Ontario, PJM) received via the NPCC CP-8 WG process. • Starting 2024 RNA, the top 5 (instead of 3) summer and winter peak load days of an external Control Area modeled as coincident with the NYCA top 5 peak load days. • Load and capacity fixed through the study years. • The renewable and energy limited shapes are removed. • EOPs are not represented for the external Control Area capacity models. • External Areas adjusted to be between 0.1 and 0.15 event-days/year LOLE by adjusting capacity pro-rata in all areas. • Implemented a statewide emergency assistance (from the neighboring systems) limit of 3500 MW. • LFU is applied to neighboring systems. • Same load historical years are used as NY.			
1	PJM	Simplified model: The 5 PJM MARS areas (bubbles) were consolidated into one starting 2020 RNA. As per RNA procedure.	Simplified model: The 5 PJM MARS areas (bubbles) were consolidated into one starting 2020 RNA. As per RNA procedure.
2	ISONE	Simplified model: The 8 ISO-NE MARS areas (bubbles) were consolidated into one starting 2020 RNA	Simplified model: The 8 ISO-NE MARS areas (bubbles) were consolidated into one starting 2020 RNA
3	HQ	Per RNA Procedure.	Per RNA Procedure.
4	IESO	Per RNA procedure.	Per RNA procedure.
5	Reserve Sharing	All NPCC Control Areas indicate that they will share reserves equally among all members before sharing with PJM.	All NPCC Control Areas indicate that they will share reserves equally among all members before sharing with PJM.
6	NYCA Emergency Assistance Limit	Implemented a statewide limit of 3,500 MW, additional to the “pipe” limits.	Implemented a statewide limit of 3,500 MW, additional to the “pipe” limits.
Miscellaneous			
1	MARS Model Version	4.14.2179	5.7.3765