

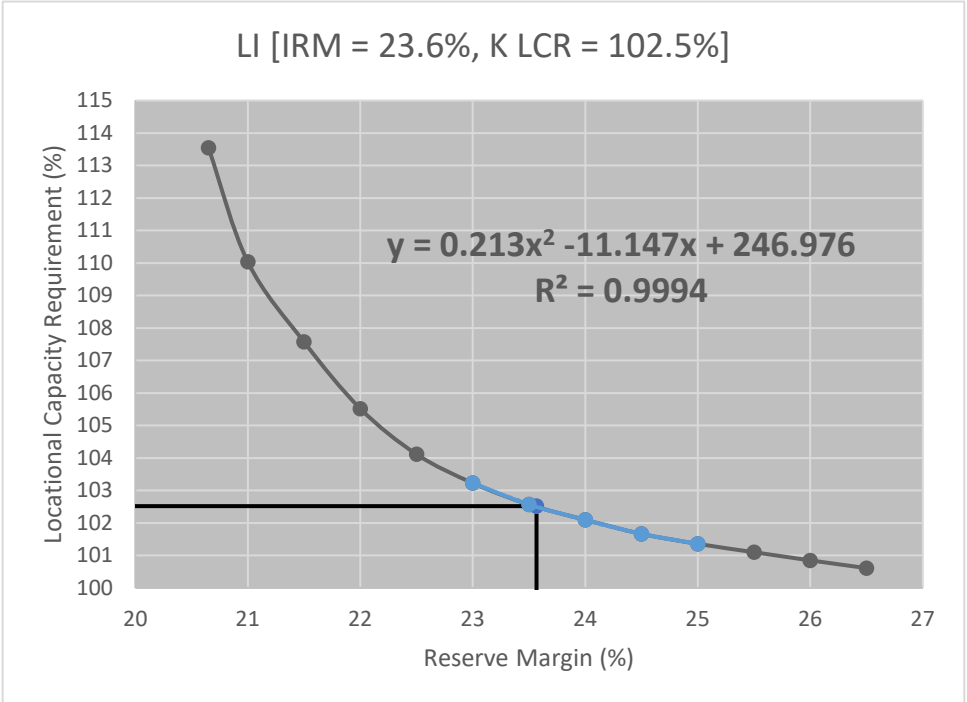
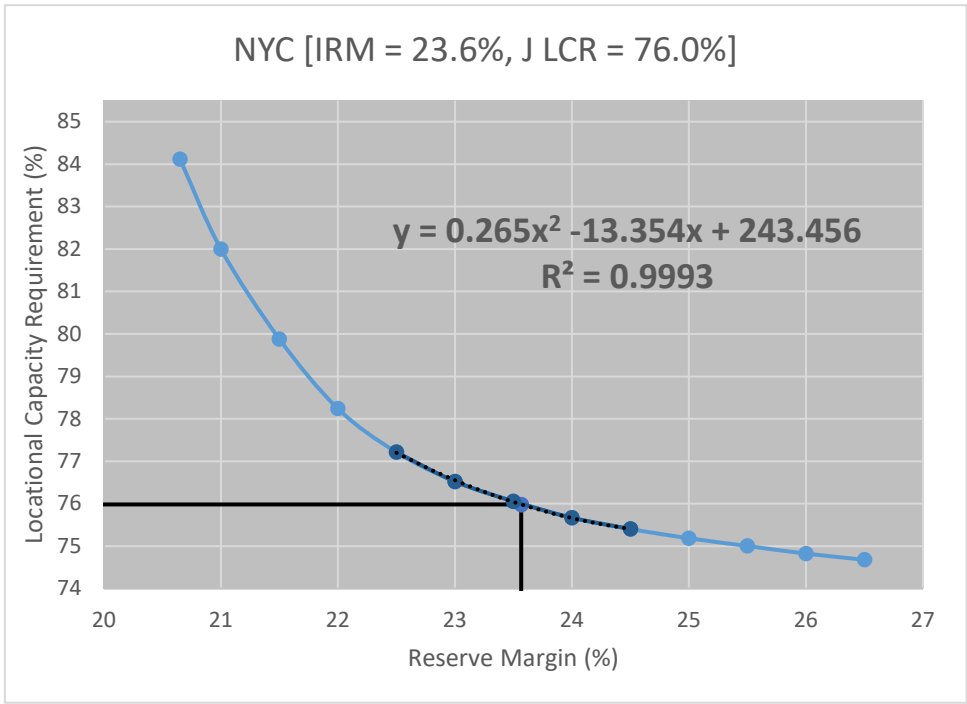
**IRM 2025 Preliminary Base Case Parametric Results (as of 07/30/2024)**

Material Changes						
Number	Adjustment Type	Description	Impact on Margins			
			NYCA	NYC	LI	LHV
		IRM 2024 Final Base Case	23.1	72.7	103.2	84.6
1	A-K	EFORd Thermal Outage Rate (2019-2023)	-0.06	-0.02	-0.08	-0.03
2	A-K	RoR Shape (2019-2023)	-0.11	-0.08	-0.10	-0.08
3	A-K	Enhanced SCR Modeling	-0.57	-0.40	-0.54	-0.44
4	G-K	Cable Transition Rate	0.14	0.19	0.27	0.21
5	A-K	BTM:NG	0.31	0.35	-0.40	0.38
6	A-K	2024 Gold Book DMNC Update	0.42	-0.71	1.25	-0.11
7	G-K	Summer Maintenance (Unit Swap)	0.06	0.08	0.11	0.09
8	G-K	Generator Deactivations	0.01	0.35	-1.34	0.46
9	A-F	New Generators	0.86	0.00	0.00	0.00
10	A-K	External Transactions	-0.05	-0.03	-0.05	-0.04
11	G-K	EOP Call Limit Update for Voluntary Curtailments and Public Appeals	1.02	1.38	1.84	1.51
12	G-K	EA Modeling Update for PJM HVDC Cables	0.34	0.46	0.61	0.50
13	G-K	Cable Outage Rate Update (10-Year History)	-0.14	-0.19	-0.25	-0.20
14	A-K	External Data + Policy 5 Adjustment	-0.25	-0.18	-0.24	-0.19
		Sum of Material Changes	1.98	1.20	1.09	2.06
		Non Material Changes	-0.01	-0.28	0.21	-0.04
		<b>Preliminary Base Case Parametric Results **</b>	<b>25.06</b>	<b>73.66</b>	<b>104.50</b>	<b>86.60</b>

**\*\* The LCR values reported are neither Tan 45 results nor LCR Optimizer results. The actual LCRs will be determined and approved by the NYISO's Operating Committee in January 2025 based upon the EC approved IRM and database model with modifications pursuant to Market Services Tariff Section 5.11.**

Non-Material Changes (Less than 0.05% delta on IRM)						
Number	Adjustment Type	Description	Impact on Margins			
			NYCA	NYC	LI	LHV
1	A-F	LFG Shape (2019-2023)	0.00	0.00	0.00	0.00
2	A-K	Solar Shape (2019-2023)	0.00	0.00	-0.01	0.00
3	A-K	Wind Shape (2019-2023)	-0.03	-0.03	-0.03	-0.03
4	G-K	Shifting Offshore Wind Shape	0.00	0.00	0.00	0.00
5	A-K	2024 Gold Book Load Forecast	0.00	-0.26	0.23	-0.03
6	G-K	EFORd Corrections	0.00	0.01	0.01	0.01
7	A-K	BTM Solar Load Shape Adjustment	0.00	0.00	0.00	0.00
8	A-F	Internal Topology Update	0.00	0.00	0.00	0.00
9	A-K	PJM Western Ties Update	0.02	0.01	0.02	0.01
		Sum of Non-Material Changes	-0.01	-0.28	0.21	-0.04

IRM 2025-2026 Preliminary Base Case Tan45



Step	EOP	Expected Implementation (Days/Year)
1	Require SCRs (Load and Generator)	7.4
2	5% manual voltage reduction	5.9
3	30-minutes reserve to zero	5.6
4	Voluntary load curtailment	3.5
5	Public appeals	3.2
6	5% remote controlled voltage reduction	3.1
7	Emergency purchases	2.3
8	10-minutes reserve to 400 MW	0.2
9	Customer disconnections	0.1

**Note:** The expected implementation days per year reported in each EOP step are the expected number of days that MARS calls for that EOP step. If an EOP step has a limitation on the number of days that it can provide relief, such as the 3 calls per year for Voluntary Curtailment and Public Appeals, it will provide no load relief after the 3rd call. Starting with the 2025-2026 IRM study year, SCRs have been modeled utilizing a duration limitation with hourly response rates, along with replacing the 5 calls per month limitation with a 1 call per day limitation.

SCR Calls Per Month	
Month	Days/Month
JAN	0.0
FEB	0.0
MAR	0.0
APR	0.0
MAY	0.0
JUN	0.3
JUL	2.7
AUG	2.9
SEP	1.5
OCT	0.0
NOV	0.0
DEC	0.0

For information at the 07/30/2024 NYSRC ICS Meeting

2025 - 2026 IRM PBC Tan45				
Summary Results				
	IRM	J LCR	K LCR	G-J
IRM Tan45	23.6	76.0	102.5	87.5

J /K Individual Tan45 Regression Outcome				
J - Tan45	23.301	76.230		
K - Tan45	23.831		102.237	

J / K Regression Formula				
	$ax^2$	bx	c	LCR
J LCR	0.265	-13.353	243.456	75.955
K LCR	0.213	-11.147	246.976	102.480

Sections on J and K Curves for the final Tan45 Results			
J Curve Section		K Curve Section	
First Point	Last Point	First Point	Last Point
22.50	24.50	23.00	25.00

Low point and the 12 points on the Tan45 Curve

IRM	J_LCR	K_LCR
20.65	84.12	113.55
21.00	82.00	110.03
21.50	79.88	107.57
22.00	78.24	105.52
22.50	77.21	104.11
23.00	76.53	103.23
23.50	76.06	102.56
24.00	75.67	102.10
24.50	75.40	101.66
25.00	75.19	101.36
25.50	75.00	101.10
26.00	74.83	100.85
26.50	74.68	100.61

IRM Results Comparison					
Case	IRM (%)	LOLH (hours/yr)	EUE (MWhr/yr)	Normalized EUE (Simple Method)	Normalized EUE (Bin Method)
2024-2025 IRM Final Base Case	23.1	0.377	225.092	1.478	1.331
2025-2026 IRM Preliminary Base Case	23.6	0.388	234.724	1.554	1.386

Note: The LOLH and EUE metrics reported here for information purposes only were requested by the NYS Reliability Council. The data used to calculate the LOLH and EUE were obtained from the GE MARS output.<sup>1</sup>

1. <https://www.nysrc.org/wp-content/uploads/2023/04/NormalizedEUECalculationMethods-v1forMarch30RCMS.pdf>

# 2025-2026 Installed Reserve Margin (IRM) Preliminary Base Case (PBC) *- Tan45 Results*

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Henry Fox

Resource Adequacy

**ICS Meeting #292**

July 30, 2024

# 2025-2026 IRM: PBC Tan45 Results

Results	2024-2025 IRM Final Base Case (FBC)		2025-2026 IRM PBC	Delta
IRM	23.1		23.6	0.5%
Load Zone J	72.7		76.0	3.3%
Load Zone K	103.2		102.5	-0.7%
G-J Locality	84.6		87.5	2.9%
NYCA EOP (Days/Yr.)	8.1		7.4	-0.7
Case	Loss of Load Expectation (LOLE)	Hourly Loss of Load Expectation (LOLH)	Normalized Loss of Energy Expectation or LOEE (Expected Unserved Energy or EUE) "Simple Method" ppm	Normalized LOEE (EUE) "Bin Method" ppm
2024-2025 IRM FBC	0.100	0.377	1.478	1.331
2025-2026 IRM PBC	0.100	0.386	1.554	1.386

# Observations

- **The NYISO identified two contributing factors to the increase in the IRM and Load Zone J locational capacity requirement (LCR).**
- **New solar generation added upstate<sup>1</sup>**
  - Additional 346.8 MW resulted in a 0.86% parametric increase to the IRM
- **Certain Assumption Updates<sup>2</sup>**
  - Additional limits on Emergency Assistance (EA) applied to PJM high voltage direct current (HVDC) lines
  - Updated downstate cable forced outage rate calculation (10-year vs. 5-year)
  - Changes to Emergency Operating Procedures (EOP)
    - Limiting Voluntary Load Curtailment and Public Appeals to three calls per year.
      - MW are significantly concentrated downstate for these two steps.
      - Limiting the three-calls per year with no load relief after the third call.

1. <https://www.nysrc.org/wp-content/uploads/2024/06/New-Generator-Screening-06052024-ICS33408.pdf>  
2. [https://www.nysrc.org/wp-content/uploads/2024/06/NYSRC-Recommendations-for-Adoption\\_v233558.pdf](https://www.nysrc.org/wp-content/uploads/2024/06/NYSRC-Recommendations-for-Adoption_v233558.pdf)



# Impact of EOP Changes

- **Public Appeals and Voluntary Load Curtailments are sourced primarily downstate.**
  - Voluntary Curtailments: 267.17 MW
  - Public Appeals: 74 MW
- **The limitation of Voluntary Curtailment and Public Appeals relief causes the GE Multi-Area Reliability Simulation (MARS) program to rely further on subsequent EOP steps which do not provide as much relief to the system.**
- **A Tan45 test case was conducted to reverse the three-calls per year limitation for these steps, the following MW impact is based on peak zonal demand:**
  - IRM: +322 MW
  - Load Zone J LCR: +95 MW
  - Load Zone K LCR: +93 MW
  - G-J Locality: +95 MW
- **Overall, the observed increase in MW requirements across locations are consistent with the reduction in load relief.**

Margin	2025-2026 IRM PBC <i>(Tan45)</i> <i>Voluntary Curtailment and Public Appeals Limited to 3 calls per year</i>	2025-2026 IRM PBC <i>(Tan45)</i> <i>Voluntary Curtailment and Public Appeals Unlimited</i>	Delta
IRM	23.6	22.6	1.0%
J LCR	76.0	75.1	0.9%
K LCR	102.5	100.7	1.8%
G-J	87.5	86.9	0.6%

# Impact of PJM EA and Cable Outage Rate Updates

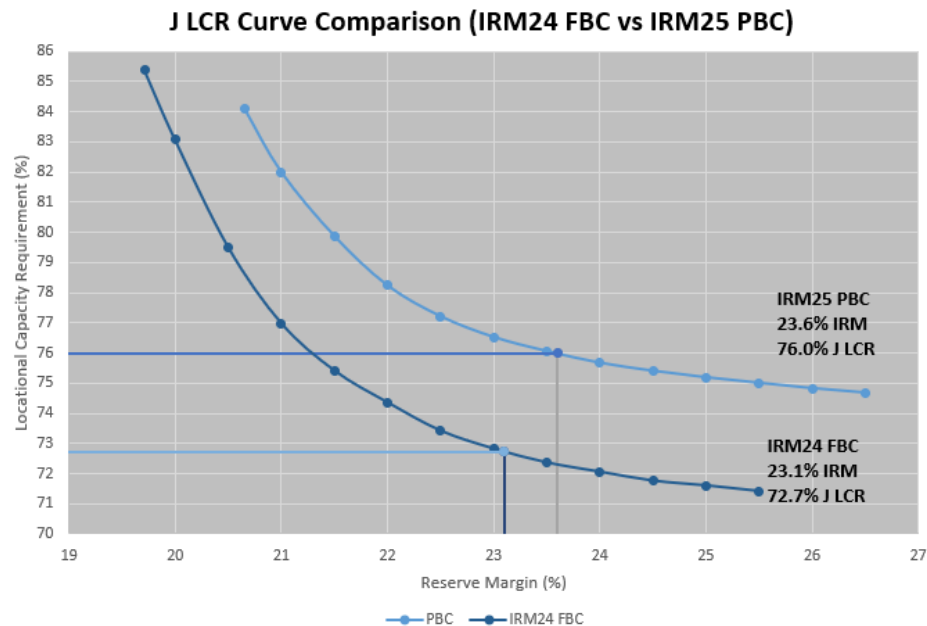
- **New EA assumptions for cables from PJM into Load Zones J and K are reducing the supply that can flow into the zones during loss of load events.**
  - This has the affect of increasing the supply requirements into the downstate region.
- **A Tan45 test case was conducted to use assumptions consistent with the 2024-2025 IRM instead of the updated EA and cable derating assumptions, the following MW impact is based on peak zonal demand:**
  - IRM: -295 MW
  - Load Zone J LCR: +329 MW
  - Load Zone K LCR: -141 MW
  - G-J Locality: +329 MW
- **The increased capacity needed in Load Zone J benefits other areas of the NYCA system, observed by a decline in the Load Zone K LCR and IRM.**

Margin	2025-2026 PBC (Tan45) <i>With EA Assumption and Cable Changes</i>	2025-2026 PBC (Tan45) <i>Without EA and Cable Changes*</i>	Delta <i>EA Assumptions and Cable Changes Impact</i>
IRM	22.6	22.7	-0.1%
J LCR	75.1	72.2	2.9%
K LCR	100.7	103.5	-2.8%
G-J	86.9	84.8	2.1%

\*PJM Emergency Assistance Update, EOP Call limit, Dynamic EA HVDC Limits, and 10-year cable outage rates

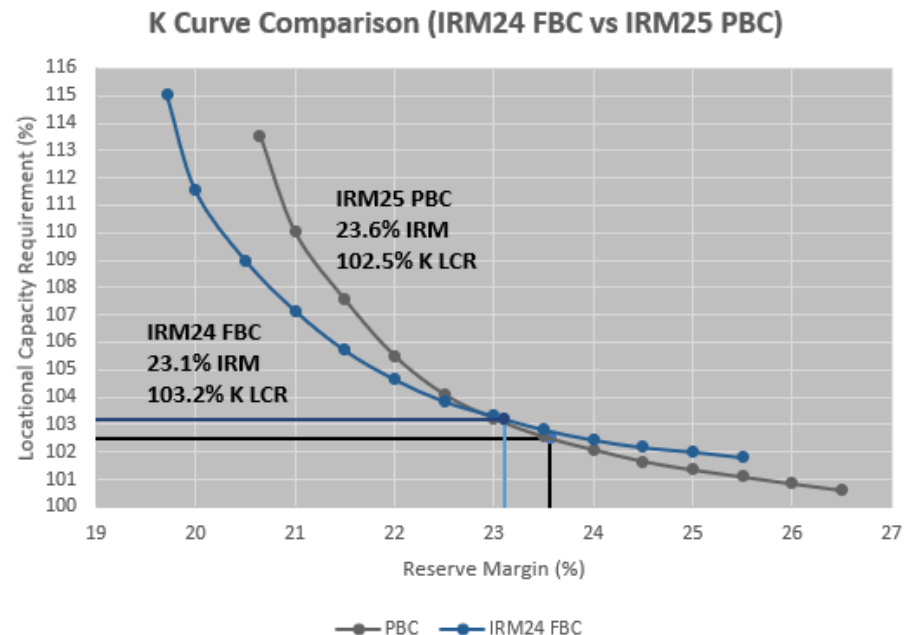
# Load Zone J - Tan45 Curve

- The three call per year limitation on Voluntary Curtailments and Public Appeals introduced upward pressure on the Load Zone J LCR due to the outsized number of MW represented downstate.
- The updated assumptions for EA flows to downstate and updated cable outage rates also contributed to the rise in the Load Zone J LCR.
- Overall, the Load Zone J Tan45 curve shifted outward relative to the 2024-2025 IRM FBC curve, as additional new generation provides upward pressure on the IRM, while updated EA, cable outage rates, and EOP assumptions placed upward pressure on the Load Zone J LCR.



# Load Zone K - Tan45 Curve

- The EOP, EA, and cable outage rate assumption changes caused an increase capacity in Load Zone J that benefits upstate and Load Zone K.
- Overall, the Load Zone K Tan45 curve became steeper reflecting that additional supply sourced upstate can support Load Zone K.



# Summary

- Relative to the 2024-2025 IRM FBC, the 2025-2026 IRM PBC exhibited a modest increase to the IRM, together with a significant increase in the Load Zone J LCR
- The major changes impacting the results are additional intermittent solar generation located upstate, a reduction in load relief from EOPs, refined Emergency Assistance assumptions from PJM for the downstate region, and updated cable outage rates

## Key Observations

- The increase in the Load Zone J LCR is driven by limiting relief from Emergency Assistance and updated EOP and cable outage rate assumptions
- The Load Zone K LCR declined due to network benefits from additional capacity needed in Load Zone J.
- The increase in the IRM is driven by additional intermittent solar generation along with updated EOP limitations.

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2024-2025 IRM FBC	0.100	0.377	1.478	1.331
2025-2026 IRM PBC	0.100	0.386	1.554	1.386

# Standard Error Analysis

- **Under the Policy 5, Section 3.8, the standard error of the IRM study should be less than 0.025 of the mean LOLE.**
  - “The ICS has determined that the desired standard error value for the mean Loss of Load Expectation (LOLE) at the 95% confidence level shall be less than or equal to 0.025 at the final iteration at three critical points; a) the beginning of the IRM Study; b) at the conclusion of the Preliminary Base Case prior to Tan 45 process; and c) at the conclusion of the Final Base Case prior to the Tan 45 process. “
- **At 3,250 replications, the standard error at the conclusion of the Preliminary Base Case prior to Tan 45 process is 0.023**
  - There is no need to increase the number of replications at this point

# Our Mission & Vision



## Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



## Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation