NYCA IRM Requirement Study 2024-2025 Preliminary Base Case (PBC) Model Assumptions Matrix

Draft V1.0

NYSRC

Installed Capacity Subcommittee Meeting #273

March 28, 2023

Load Forecast

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
1	Peak Load Forecast (Preliminary Base Case – Parametric & Sensitivities)	2022 Gold Book NYCA:32,018 MW [1] NYC: 11,001 MW LI: 5,031 MW G-J: 15,223 MW (Attachment A1)			
2	Peak Load Forecast (Final Base Case)	October 2022 Fcst. NYCA: 32,246 MW[1] NYC: 11,285 MW LI: 5,133 MW G-J: 15,407 MW			
3	Load Shape (Multiple Load Shape)	Bins 1-2: 2013 Bin 3-4: 2018 Bins 5-7: 2017			
4	Load Forecast Uncertainty (LFU)-	Zonal Model to reflect current data with input from Con Ed and LIPA. (Attachment A2)			
5	LFU Winter	Attachment A3			

1 BTM-NG loads have been incorporated into these numbers.

Generation Parameters

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
6	Existing Generating Unit Capacities	2022 Gold Book Values. Use min. (DMNC vs. CRIS) capacity value			
7	Proposed New Units (Thermal) and re-ratings	0 MW of new Thermal resources, (Attachment B1)			
8	Deactivations and Removals[3]	1,331.2 MW unit deactivations (Attachment B2)			
9	Forced and Partial Outage Rates	Five-year (2017-2021) GADS data for each unit represented. Those units with less than five years – use representative data. (Attachment C)	Five-year (2018-2022) GADS data for each unit represented. Those units with less than five years – use representative data. (Attachment C)	Transition Rates representing the Equivalent Forced Outage Rates (EFORd) during demand periods over the most recent five-year period	N
10	Planned Outages	Based on schedules received by the NYISO and adjusted for history			

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Generation Parameters

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
11	Summer Maintenance	Nominal 50 MWs – divided equally between Zones J and K			
12	Combustion Turbine Derates	Derate based on temperature correction curves provided			
13	Existing and Proposed New Wind Units[4]	539.3 MW of Wind Capacity additions totaling 2351.1 MW of qualifying wind (Attachment B3)			
14	Wind Shape	Actual hourly plant output over the period 2017-2021. New units will use zonal hourly averages or nearby units	Actual hourly plant output over the period 2018-2022. New units will use zonal hourly averages or nearby units	Program randomly selects a wind shape of hourly production from the most recent five-year period for each model iteration.	N
15	Existing and Proposed New Solar Resources[4]	0 MW of Solar Capacity additions totaling 214.4 MW of qualifying Solar Capacity. (Attachment B3)			
16	Solar Shape	Actual hourly plant output over the period 2017-2021. New units will use zonal hourly averages or nearby units	Actual hourly plant output over the period 2018-2022. New units will use zonal hourly averages or nearby units	Program randomly selects a solar shape of hourly production from the most recent five-year period for each model iteration.	N

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Generation Parameters

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
17	BTM- NG Program	No new BTM NG resources, for 161.6 MW (Attachment B5)			
18	Small Hydro Resources	Actual hourly plant output over the period 2017-2021.	Actual hourly plant output over the period 2018-2022.	Program randomly selects a hydro shape of hourly production from the most recent five-year period for each model iteration.	N
19	Large Hydro	Probabilistic Model based on five years of GADS data (2017-2021)			
20	Landfill Gas	Actual hourly plant output over the period 2017-2021.	Actual hourly plant output over the period 2018-2022.	Program randomly selects an LFG shape of hourly production from the most recent five-year period for each model iteration.	N
21	New ESR (Energy Storage Resources)[4]	20 MW of new battery storage scheduled. 20 MW of total battery storage modeled (see attachment B4)			
22	Energy Limited Resources (ELR)	Based upon elections made by August 1st 2021			

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Transactions- Imports and Exports

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
23	Capacity Purchases	Existing Rights: PJM – 1,080 MW HQ – 1,190 MW All contracts modeled as equivalent contracts.			
24	Capacity Sales	Long Term firm sales Summer 265.4 MW			
25	FCM Sales from a Locality[3]	No sales modeled within study period			
26	Wheels through NYCA	300 MW HQ to NE equivalent contract			
27	New UDRs (Unforced capacity Deliverability Rights)	No new UDRs Identified			
28	New EDRs (External Deliverability Rights)	No new EDRs Identified			

[3] Final FCM sales that will materialize are unknowable at the time of the IRM study. To reflect the impact these sales have on reliability, the NYISO applies a Locality Exchange Factor in the market.

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Topology

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
29	Interface Limits	Central East forward and Group limit updates due to AC Transmission Segment A, Neptune no longer derated unless further delay in return to full service, UPNY-ConED series reactors in service, West Central Reverse uprate External transfer limits update , Zone K export Transfer Limit update	Updates to the forward limits of Central East, Central East Group ,Marcy South, Capital to Hudson Valley, UPNYSENY, and UPNY-ConEd interfaces due to the full in service of AC Transmission Project.	Based on the most recent NYISO studies and processes, such as Operating Study, Operations Engineering Voltage Studies, Comprehensive System Planning Process, and additional analysis including interregional planning initiatives	Y
30	New Transmission	None Identified			
31	AC Cable Forced Outage Rates	All existing Cable EFORds for NYC and LI to reflect most recent five-year history (2017-2021) (Attachment E4)			
32	UDR Line Unavailability	Five year history of forced outages (2017-2021)			

Emergency Operating Procedures

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
33	Special Case Resources	July 2022 –1224 MW based on registrations and modeled as 860 MW of effective capacity. Monthly variation based on historical experience.			
34	Other EOPs	350 MW of 10-min Operating Reserve maintained at Load Shedding 858.4 MW of non-SCR/non-EDRP resources (Attachment D)			
35	EOP Structure	10 EOP steps modeled			

External Control Areas

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
36	PJM	Load and Capacity data will be provided by ISONE/NPCC CP-8 Data may be adjusted per NYSRC Policy 5 (Attachment E)			
37	ISONE, Quebec, IESO	Load and Capacity data will be provided by ISONE/NPCC CP-8 Data adjusted per NYSRC Policy 5 (Attachment E)			
38	External Adjustments per Policy 5	If needed, add load to externals proportional to existing excess capacity			
39	Reserve Sharing	All NPCC Control Areas indicate that they will initially share reserves equally among all members and then among non-members			
40	Emergency Assistance	Statewide Limit of 3,500 MW of emergency assistance allowed from neighbors.			

Miscellaneous

#	Parameter	2023 Model Assumptions	2024 Model Assumptions	Basis for Recommendation	Model Change
41	MARS Model Version	4.10.2035			
42	Environmental Initiatives	No new rules for 2022 Capability Year			

Attachment A1

NYCA Summer Load Forecast Coincident and Non-Coincident Peak:
2023 PBC and 2023 FBC

2023 PBC												
Area	A	B	C	D	E	F	G	H	I	J	K	NYCA	G_J
NCP - Forecast	2886	2245.4	2883.5	703	1361	2428	2236	639	1398	11024.6	5072.1		
CP - Forecast	2726	2178.4	2816.5	687	1305	2390	2199	630	1379	10876.6	4992.1	32179.6	
G-J Peak - Forecast							2223	637	1394	10969			15223

2023 FBC												
Area	A	B	C	D	E	F	G	H	I	J	K	NYCA	G_J
NCP - Forecast	2824.6	2032.7	2843.6	715.4	1393.6	2477.1	2147.8	646.3	1424.4	11285.0	5133.3		
CP - Forecast	2733.0	1990.1	2775.5	695.0	1355.7	2441.5	2105.5	633.9	1397.0	11068.5	5050.3	32246.0	
G-J Peak - Forecast							2133.5	642.2	1415.6	11215.5			15406.8

Delta												
Area	A	B	C	D	E	F	G	H	I	J	K	NYCA	G_J
NCP - Forecast	-61.4	-212.7	-39.9	12.4	32.6	49.1	-88.2	7.3	26.4	260.4	61.2		
CP - Forecast	7.0	-188.3	-41.0	8.0	50.7	51.5	-93.5	3.9	18.0	191.9	58.2	66.4	
G-J Peak - Forecast							-89.5	5.2	21.6	246.5			183.8

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Attachment A2

NYCA Summer Load Forecast Uncertainty Model: 2023 and 2024

Load Forecast 2023
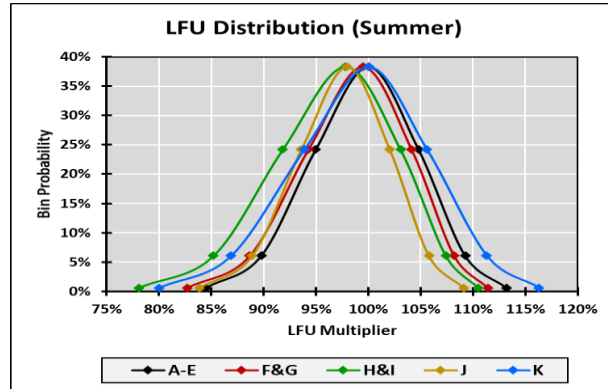
Bin	Bin z	Bin Probability	A-E	F&G	H&I	J	K
Bin 1	2.74	0.62%	113.18%	111.42%	110.50%	109.10%	116.30%
Bin 2	1.79	6.06%	109.25%	108.20%	107.41%	105.78%	111.32%
Bin 3	0.89	24.17%	104.80%	104.14%	103.08%	102.05%	105.60%
Bin 4	0.00	38.29%	100.00%	99.46%	97.82%	97.98%	100.00%
Bin 5	-0.89	24.17%	94.96%	94.28%	91.83%	93.60%	93.87%
Bin 6	-1.79	6.06%	89.75%	88.67%	85.21%	88.90%	86.89%
Bin 7	-2.74	0.62%	84.49%	82.72%	78.09%	83.89%	80.04%

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Attachment A3

NYCA Winter Load Forecast Uncertainty Model: 2023

Bin	Bin z	Bin Probability	NYCA
Bin 1	2.74	0.62%	110.29%
Bin 2	1.79	6.06%	106.26%
Bin 3	0.89	24.17%	102.65%
Bin 4	0.00	38.29%	99.37%
Bin 5	-0.89	24.17%	96.32%
Bin 6	-1.79	6.06%	93.46%
Bin 7	-2.74	0.62%	90.74%

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Attachment B1

New Thermal Units and Unit Re-Ratings

New Thermal Units and Unit Re-ratings (summer ratings)					
Project or Generator Name	Zone	2023 Gold Book (MW) CRIS	2023 Gold Book (MW) DMNC	New or Incremental (MW)	2024 MARS Model (MW)
New Units					
Total New Units and Uprates (MW)					

Attachment B2
Deactivations and Removals

Unit Removal since 2023 IRM Study			
Generator Name	Type	Zone	SUMMER CRIS (MW)
Total Removals			

Attachment B3

New Intermittent Resources

New Intermittent Units				
Resource	Zone	CRIS (MW)	Summer Capability (MW)	MARS Modeled Capacity
Wind				
Total Wind				

Solar				
Total Solar				

Attachment B4

New Energy Storage Resources

Energy Storage				
Resource	Zone	CRIS (MW)	Summer Capability (MW)	Lesser of Summer Capability VS CRIS
New Battery Units				
Total New Energy Storage				

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Attachment B5

Resources in the Behind the Meter Net Generation Program (BTM-NG)

Attachment B5 -Units in the Behind the Meter Net Generation Program*			
Generator Name	Zone	Resource Value (MW)[4]	Peak Load Adjustment (MW)[5]
Existing:			
Stony Brook	K	42.3	41.1
Greenidge 4	C	101.8	41.5
Lyons Falls Hydro	E	0.0	2.0
(CONFIDENTIAL)***	J		23.6
Red Rochester	B	78.6	53.4
Total BTM-NG			161.6

*The IRM study independently models the generation and load components of BTM:NG Resources.

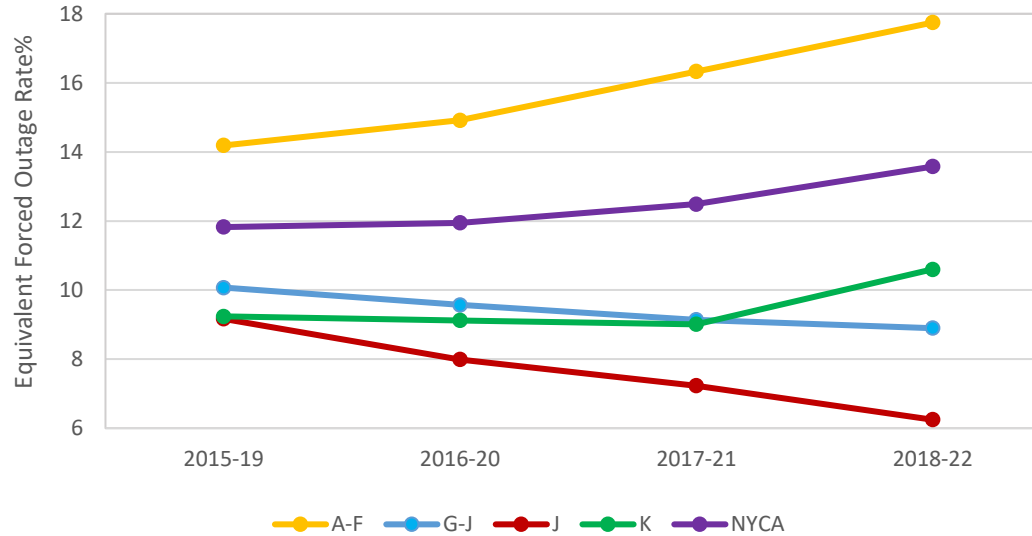[4] Based on adjusted Dependable Maximum Gross Capability (DMGC) value.

[5] Based on Average Coincident Host Load (ACHL).

*** One existing resource in Zone J is expected to begin participating in the BTM:NG program in Summer 2022

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Attachment C

NYCA Five Year Derating Factors

New York 5 Year EFORds

Attachment D

Emergency Operating Procedures

Step	Procedure	2023 IRM MW Value	2024 IRM MW Value
1	Special Case Resources –Load, Gen	1,224 MW Enrolled/ 860 MW Modeled	
2	5% manual voltage Reduction	85.43 MW	
3	Thirty-minute reserve to zero	655 MW	
4	5% remote voltage reduction	452.92 MW	
5	Voluntary industrial curtailment	240.05 MW	
6	General Public Appeals	80 MW	
7	Emergency Purchases	Varies	
8	Ten-minute reserves to zero	960 MW (350 MW maintained at load shedding)	
9	Customer disconnections	As needed	
10	Adjustment used if IRM is lower than technical study margin	As needed	

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Attachment E1

IRM Topology

Attachment E2

ISO-NE 14 Bubble Model

Attachment E3

PJM Bubble Model

Attachment E4

5 Year Average Cable Outage Rate	
2017-21	2016-20
7.50%	6.42%

The facilities included in these averages are VFT, HTP, Dunwoodie-South, Y49/Y50, CSC, Neptune, Norwalk-Northport and A-Line.

Attachment F   To be updated for 2024-2025 IRM Study

SCR Determinations 2023 and 2024 IRM Studies

SCR Performance for 2023 IRM Study					
Super Zones	Enrollments (July 2021)	Forecast (2022)[6]	Performance Factor[7]	UCAP (2022)	Adjustment Factor[8]	Model Value
A-F	694.5	694.5	0.867	602.3	0.949	571.8
G-I	79.1	79.1	0.773	61.2	0.843	51.6
J	417.5	417.5	0.705	294.4	0.744	219.1
K	33.7	33.7	0.696	23.4	0.763	17.9
Totals	1224.8	1224.8		**981.4**		**860.4**
					Overall Performance = 70.3%	

6. These values represent no growth from July 2020 ICAP based enrollments.
7. Performance Factor based on ACL methodology.
8. The SCR Adjustment factor captures two different performance derates; 1) Calculated Translation Factor (TF) between ACL and CBL values, and the Fatigue Factor (FF=1.00).

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Attachment G

To be updated for 2024-2025 IRM Study

Wind Units Modeled

Wind			
Resource	Zone	CRIS (MW)	Summer Capability (MW)	MARS Modeled Capability**
Bliss Wind Power [WT]	A	100.5	100.5	100.5
Canandaigua Wind Power [WT]	C	125.0	125.0	125.0
High Sheldon Wind Farm [WT]	C	112.5	118.1	112.5
Howard Wind [WT]	C	57.4	55.4	55.4
Orangeville Wind Farm [WT]	C	94.4	93.9	93.9
Wethersfield Wind Power [WT]	C	126.0	126.0	126.0
Altona Wind Power [WT]	D	97.5	97.5	97.5
Chateaugay Wind Power [WT]	D	106.5	106.5	106.5
Clinton Wind Power [WT]	D	100.5	100.5	100.5
Ellenburg Wind Power [WT]	D	81.0	81.0	81.0
Jericho Rise Wind Farm [WT]	D	77.7	77.7	77.7
Marble River Wind [WT]	D	215.2	215.2	215.2
Hardscrabble Wind [WT]	E	74.0	74.0	74.0
Madison Wind Power [WT]	E	11.5	11.6	11.5
Maple Ridge Wind [WT01]	E	231.0	231.0	231.0
Maple Ridge Wind [WT02]	E	90.7	90.8	90.7
Munnsville Wind Power [WT]	E	34.5	34.5	34.5
Arkwright Summit Wind Farm [WT]	A	78.4	78.4	78.4
Eight Point Wind Energy Center [WT]	C	101.8	101.8	101.8
Bluestone Wind [WT]	E	111.8	111.8	111.8
Number 3 Wind Energy [WT]	E	103.9	103.9	103.9
Ball Hill Wind [WT]	A	100.0	100.0	100.0
Baron Winds [WT]	C	121.8	121.8	121.8
Total		**2353.6**	**2356.9**	**2351.1**

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Attachment G1

Wind Units Not Currently Participating in ICAP Market

Wind					
Resource	Zone	Nameplate (MW)	CRIS (MW)	Summer Capability (MW)	MARS Modeled Capacity
Erie Wind [WT]	A	15.0	0.0	0.0	0.0
Steel Wind [WT]	A	20.0	0.0	0.0	0.0
Western NY Wind Power [WT]	B	6.6	0.0	0.0	0.0
Marsh Hill Wind Farm [WT]	C	16.2	0.0	0.0	0.0
Copenhagen Wind [WT]	E	79.9	79.9	0.0	0.0
Roaring Brook [WT]	E	79.7	79.7	0.0	0.0
Fenner Wind [WT]	C	30.0	30.0	0.0	0.0
Cassadaga Wind [WT]	A	126.0	126.5	0.0	0.0
Total		**373.4**	**316.1**	**0.0**	**0.0**

Attachment G2

Solar Units Modeled

Solar				
Resource	Zone	CRIS (MW)	Summer Capability (MW)	Lesser of Summer Capability vs. CRIS
Long Island Solar Farm [PV]	K	31.5	31.5	31.5
Calverton Solar Energy Center [PV]	K	22.9	22.9	22.9
Brandscomb Solar [PV]	F	20.0	20.0	20.0
Darby Solar [PV]	F	20.0	20.0	20.0
Grissom Solar [PV]	F	20.0	20.0	20.0
Janis Solar [PV]	C	20.0	20.0	20.0
Pattersonville Solar [PV]	F	20.0	20.0	20.0
Puckett Solar [PV]	C	20.0	20.0	20.0
ELP Stillwater Solar [PV]	F	20.0	20.0	20.0
Regan Solar [PV]	F	20.0	20.0	20.0
Total		**214.4**	**214.4**	**214.4**

Attachment G3

Solar Units Not Modeled

Solar				
Resource	Zone	CRIS (MW)	Summer Capability (MW)	Lesser of Summer Capability vs. CRIS
Shoreham Solar [PV]*	K	24.9	0.0	0.0
Total		24.9	0.0	0.0

*Unit provides power at the distribution rather than at the transmission level.

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Attachment G4

LFG Units Modeled

LFG				
Resource	Zone	CRIS (MW)	Summer Capability (MW)	Lesser of Summer Capability VS CRIS
CHAFEE [IC]	A	6.4	6.4	6.4
Model City Energy LFGE [IC]	A	5.6	5.6	5.6
Modern LFGE [IC]	A	6.4	6.4	6.4
Hyland LFGE [IC]	B	4.8	4.8	4.8
Mill Seat [IC]	B	6.4	6.4	6.4
Broome 2 [IC]	C	2.0	2.0	2.0
Broome LFGE [IC]	C	2.1	2.1	2.1
High Acres Group [IC] (23767)	C	9.6	9.6	9.6
Ontario LFGE [IC]	C	11.2	11.2	11.2
Seneca Energy Group [IC] (23797)	C	17.6	17.6	17.6
Clinton LFGE [IC]	D	6.4	6.4	6.4
DANC LFGE [IC]	E	6.4	6.4	6.4
Oneida-Herkimer LFGE [IC]	E	3.2	3.2	3.2
Colonie LFGTE [IC]	F	6.4	6.4	6.4
Fulton County Landfill [IC]	F	3.2	3.2	3.2
Totals		**97.7**	**97.7**	**97.7**

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Attachment G5

LFG Units Not Modeled

LFG				
Resource	Zone	CRIS (MW)	Summer Capability (MW)	Lesser of Summer Capability VS CRIS
Albany LFGE	F	4.5	5.6	4.5
Madison County LFGE [IC]	E	1.6	1.6	1.6
Total		**6.1**	**7.2**	**6.1**

Assumption Matrix History

Date	Ver	Preliminary Base Case	Date	Ver	Final Base Case
2/1/23	V0.0	Preliminary assumptions without attachments			
3/28/23	V1.0	Preliminary assumptions without attachments			

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