ANNUAL ASSESSMENT OF RESOURCE ADEQUACY

COVERING THE NEW YORK CONTROL AREA
For the years 2018–2020

In compliance with the NYSRC Reliability Rule A.3 Requirement R1

Presented to the
Reliability Compliance Monitoring Subcommittee of the
New York State Reliability Council

June 28th, 2018

EXECUTIVE SUMMARY

This assessment complies with the New York State Reliability Council ("NYSRC") Reliability Rule A.3 (*Review of Resource Adequacy)* Requirement R1 over the assessment period of 2018-2020.

While this assessment is not a probabilistic (*i.e.,* MARS) study, it compares forecast capacity and loads against current installed capacity requirements (*i.e.,* IRM and LCRs) that are established based on probabilistic resource adequacy analyses. For purposes of this report, the current IRM and LCRs are also applied over two future years (i.e., 2019 and 2020). Since the current IRM and LCRs are calculated only for the first year (2018) and those probabilistic calculations are dependent on system conditions, the current IRM and LCRs are not necessarily a projection of IRMs and LCRs in the future. As such, any finding in this report that future system conditions may not meet the current IRM or LCRs does not necessarily mean that the future system cannot meet the loss of load expectation ("LOLE") resource adequacy criterion of 0.1 days per year.

The NYSRC conducts annual resource adequacy studies that establish the statewide Installed Capacity ("ICAP") reserve margin (i.e., IRM study)[1] for the New York Control Area ("NYCA") for the upcoming capability period. From the period of 1999 through 2017, these studies have resulted in the NYSRC adopting reserve margins ranging from 15% to 18%. For 2018, the Installed Reserve Margin ("IRM") was established at 18.2% and was assumed to be the same value for 2019 and 2020 for purposes of this report.

For the analysis, two base cases and one extreme case were evaluated against the baseline forecast of peak load set forth in the 2018 Gold Book.[2] The first base case is referred to herein as the Class Year ("CY") completed case, which includes the 2018 Gold Book's ICAP existing resources plus those that have completed their Class Year facilities study as identified in the 2018 Gold Book.[3] The second base case is referred to herein as the Interconnection Agreement ("IA") completed case, which includes the 2018 Gold Book's existing units plus those identified on the NYISO Interconnection Queue as having completed an Interconnection Agreement as of May 2018. A third case is referred to herein as the Extreme case and assumes an extreme scenario in which no capacity additions occur during the assessment period. All of these cases utilize only expected New York Control Area resources. The derivation of these cases is documented in the attached Appendices 1, 1A, and 1B.

[1] *See, e.g.*, NYSRC Report titled, "New York Control Area Installed Capacity Requirement for the Period May 2018 to April 2019," December 8, 2017.
[2] The NYISO "Load & Capacity Data" publication is commonly referred to as the "Gold Book." The baseline forecast of peak load data is provided in the 2018 Gold Book under Tables I-3a, I-4a, and I-5.
[3] At the time of finalizing this assessment the NYISO 2017 Class Year study process remains ongoing and therefore projects in the 2017 Class Year such as Cricket Valley Energy Center II are not in the Class Year completed case, but because Cricket Valley Energy Center II has executed its Interconnection Agreement, it is included in the Interconnection Agreement completed case.

In addition to the scenarios described above using the baseline forecast of peak load, the two base cases were also evaluated under the extreme scenario utilizing the 90th percentile forecast of peak load.[4]

With the baseline forecast of peak load, an 18.2% statewide IRM would be met (meaning that the reserve margin percentage beyond forecasted annual peak load would equal to or exceed 18.2 percent) throughout the assessment period, even under the Extreme case. The extreme scenario of the 90th percentile forecast of peak load is already included in the two base cases because NYSRC's annual IRM study has adopted the Load Forecast Uncertainty ("LFU") in its probabilistic model. The LFU is referenced off of the baseline forecast data. To isolate the results of a specific forecast, such as the 90th percentile forecast of peak load, a deterministic assessment needs to be performed. Based on a deterministic assessment, an 18.2% IRM would still be met for the 90th percentile forecast of peak load throughout the assessment period.

The NYISO conducts an annual locational requirements study[5] that establishes minimum Locational Capacity Requirements ("LCRs") for the New York City, Long Island, and the G-J Locality.[6] Currently, the New York City LCR is 80.5% of the New York City capability year peak load forecast. The Long Island LCR is currently 103.5% of the Long Island capability year peak load forecast. The G-J Locality LCR is currently 94.5% of the G-J Locality capability year peak load forecast. These LCRs were assumed to be the same values for 2019 and 2020 for purposes of this report.

With the baseline forecast of peak load and the proposed 2018-2020 resource additions, New York City, Long Island, and the G-J Locality would meet the respective LCRs over the assessment period.

It is worth noting that even without any resource additions, New York City and Long Island would still be able to meet their respective LCRs for the baseline forecast of peak load throughout the assessment period. The G-J Locality, however, could not meet an LCR of 94.5% for the forecast of specific annual peak load in 2020 without any resource additions since Indian Point Energy Center Unit 2 is planned to retire in 2020.

Similar to the IRM study, the probabilistic model in NYISO's annual LCR study has also adopted the LFU model in the baseline forecast data. To consider a specific forecast, such as the 90th percentile forecast of peak load, a deterministic assessment needs to be performed. Based on a deterministic assessment of the 90th percentile forecast of peak load and the proposed 2018-2020 resource additions, New York City and Long Island would still meet LCRs of 80.5% and 103.5% throughout the assessment period, respectively. The G-J Locality would also meet an LCR of 94.5% for the 90th percentile forecast of peak load with the proposed 2018-2020 resource additions in the IA completed case throughout the assessment period; however, without the Cricket Valley Energy

[4] The 90th percentile forecast of peak load data is provided in the 2018 Gold Book under Table I-7a. The 90th percentile forecast of peak load is one point within the range defined by the Load Forecast Uncertainty in the probabilistic model.

[5] *See, e.g.*, NYISO Report titled, "Locational Minimum Installed Capacity Requirements Study Covering the New York Control Area for the 2018–2019 Capability Year," January 18, 2018.

[6] The G-J Locality encompasses Load Zones G, H, I, and J.

Center II units, which are under construction and have an executed Interconnection Agreement, but have not completed a Class Year study, the G-J Locality could not meet an LCR of 94.5% for the 90th percentile forecast of specific annual peak load in 2020 based on a deterministic assessment that only considers expected New York Control Area resources.

It is important to note that any deterministic assessment, including the Extreme case utilizing the baseline forecast of peak load and all extreme scenarios utilizing the 90th percentile forecast of peak load, only provide limited "what if" information and, without a probabilistic assessment, do not test resource adequacy.

INTRODUCTION

This assessment is performed to satisfy NYSRC Reliability Rule A.3 Requirement R1,[7] which states:

> **R1.** An *NYCA resource adequacy* assessment shall be conducted annually for the next summer period and two years beyond, for demonstrating that proposed NYCA *resources* meet NYCA statewide *IRM* and New York City and Long Island *locational capacity requirements* as determined by *NYSRC* and *NYISO* studies conducted in accordance with A.1 and A.2. The assessment shall be documented in a *resource* adequacy report, covering at a minimum, the evaluations and information below:
>
> R1.1 The assessment shall evaluate a base case assuming proposed *resources* and the most likely *load* forecast, as well as alternate scenarios approved by RCMS.
>
> R1.2 Any potential base case *resource* adequacy needs shall be addressed by *NYISO* procedures. The *NYISO* shall report to the *NYSRC* on identified needs and possible corrective actions consistent with *NYISO* procedures.
>
> R1.3 The *resource* adequacy report shall include key assumptions and other factors considered in the assessment.

The statewide requirement is met under NYSRC Reliability Rule A.1 Requirement R1 which reads:

> **R1.** The NYSRC shall annually perform and document an analysis to calculate the NYCA *Installed Reserve Margin (IRM)* requirement for the following Capability Year. The IRM analysis shall:
>
> R1.1 Probabilistically establish the IRM requirement for the NYCA such that the loss of *load* expectation (LOLE) of disconnecting *firm load* due to *resource* deficiencies shall be, on average, no more than 0.1 days per year. This evaluation shall make due allowances for *demand* uncertainty, scheduled outages and deratings, forced outages and deratings, assistance over interconnections with neighboring *control areas, emergency NYS Transmission System transfer capability,* and *capacity and/or load relief* from available *operating procedures*.

For the 2018 capability year, the NYSRC determined that this criterion will be met with an ICAP requirement of 118.2% of the forecast NYCA peak load. This assessment

[7] New York State Reliability Council Reliability Rules & Compliance Manual for Planning and Operating the New York State Power System, Version 43, May 11, 2018.

compares reserve margins derived from resource projections and the peak load forecast over the assessment period against an assumed 18.2% IRM requirement.[8]

In addition to the NYSRC requirement on the NYCA IRM, the NYISO establishes the LCRs.[9] The NYISO defines a locational requirement as:

> A locational ICAP requirement specifies the minimum amount of installed capacity that must be procured from resources situated specifically within a Locality. It considers generation within the Locality as well as the transmission import capability to the Locality in order to meet the resource adequacy reliability criteria of the NYSRC and the Northeast Power Coordinating Council ("NPCC"). These criteria require that the NYCA Loss of Load Expectation ("LOLE") shall be, on average, no more than 0.1 days per year. Further, NYISO's Market Administration and Control Area Services Tariff and the NYSRC Reliability Rules require the NYISO to establish locational ICAP requirements.

This assessment also examines the ratios of capacity to load for New York City, Long Island, and the G-J Locality[10] over the assessment period. These ratios are then compared to the existing LCRs in order to determine whether the planned resources are adequate for these Localities.

LOAD FORECAST

NYISO's forecast involves a two-step process. In the first step, the overall NYCA energy requirements are forecasted. The model used in the energy requirements forecast has considered the manufacturing employment share, education and health care employment share, total income, and other demographic variables. In the second step, the total NYCA peak demand is forecasted. The peak demand is derived, zone by zone, from the annual energy using load factors averaged over the previous five years. The annual energy and the peak demand are projected with the impact of statewide energy saving programs and behind-the-meter generation.

Figure 1 shows the peak load forecast for the NYCA from the 2018 Gold Book.[11] The solid line is the baseline forecast of peak load[12] and the dashed line represents the 90th percentile forecast of peak load.[13] The average annual growth rate of the NYCA peak load forecast over 2018-2020 assessment period is also identified.

[8] New York State Reliability Council report titled, "New York Control Area Installed Capacity Requirement for the Period May 2018 to April 2019", December 8, 2017.
[9] NYISO report titled, "Locational Minimum Installed Capacity Requirements Study Covering the New York Control Area for the 2018–2019 Capability Year," January 18, 2018.
[10] The G-J Locality encompasses Load Zones G, H, I, and J.
[11] The NYISO "Load & Capacity Data" publication is commonly referred to as the "Gold Book."
[12] The baseline forecast of peak load data is provided in the 2018 Gold Book under Tables I-3a, I-4a, and I-5.
[13] The 90th percentile forecast of peak load data is provided in the 2018 Gold Book under Table I-7a. The 90th percentile forecast of peak load is one point within the range defined by the Load Forecast Uncertainty in the probabilistic model.

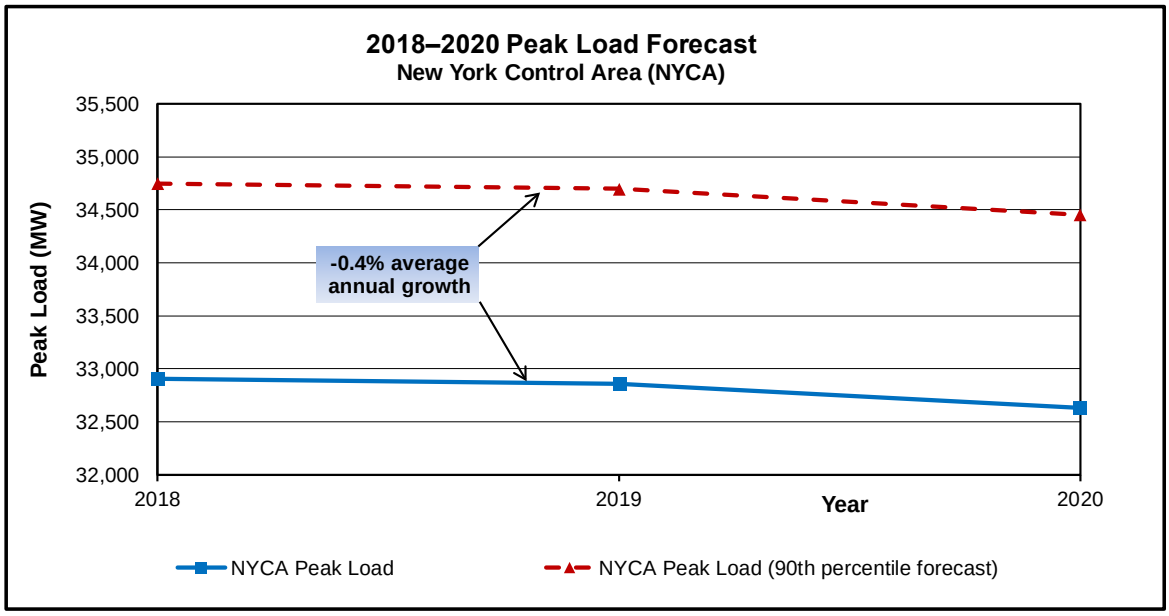

Figure 1. Peak load forecast for the New York Control Area

Figures 2, 3, and 4 show the peak load forecast for New York City ("NYC"), Long Island ("LI"), and the G-J Locality from the 2018 Gold Book, respectively, as well noting the average annual growth rate for each respective Locality during the 2018-2020 assessment period.

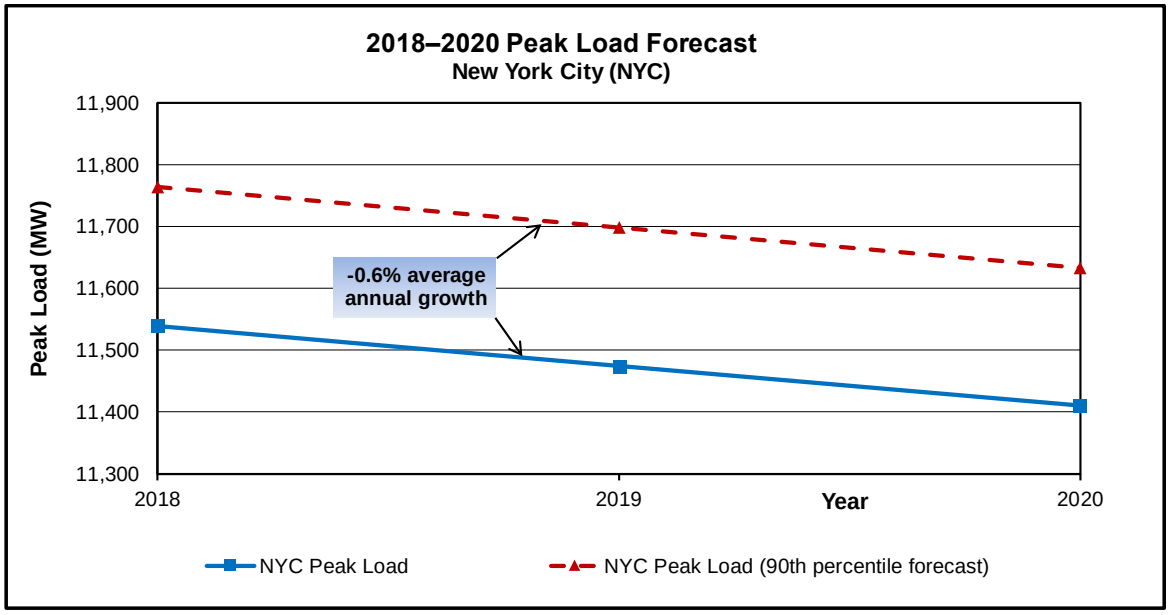

Figure 2. Peak load forecast for New York City

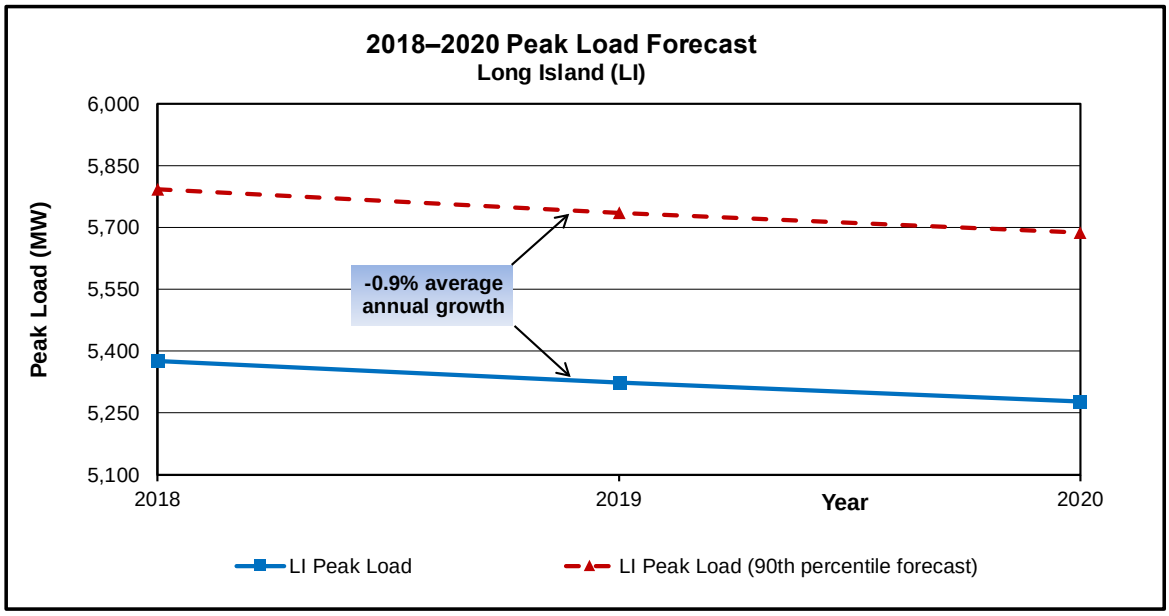

Figure 3. Peak load forecast for Long Island

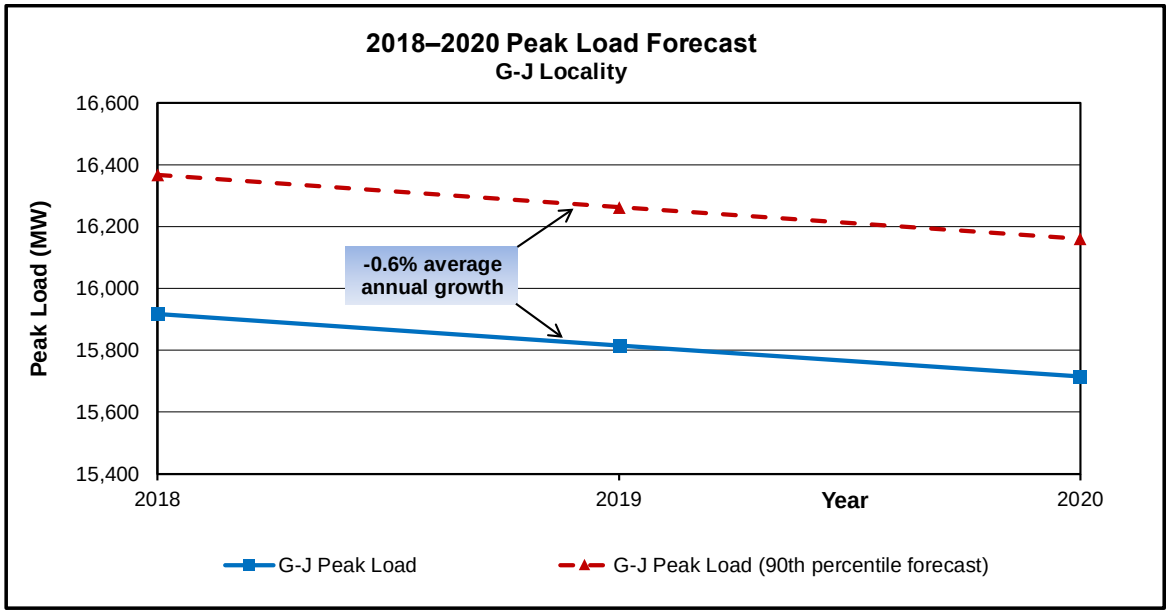

Figure 4. Peak load forecast for G-J Locality

CAPABILITY PROJECTIONS

The NYCA 2018-2020 capability projections from the 2018 Gold Book are shown in Figure 5.[14] This projection incorporates capacity additions, re-ratings, and deactivations that are identified in the 2018 Gold Book and uses the lesser of the summer Capacity Resource Interconnection Service ("CRIS") or summer Demonstrated Maximum Net Capability ("DMNC") values for each unit. The statewide net purchases[15] and Special Case Resources ("SCRs") are also included based on the information in Tables V-1 and V-2a of the 2018 Gold Book.

Capacity projections are broken into two curves in Figure 5. The first one labeled "CY completed" contains project additions and re-ratings that have completed their Class Year ("CY") facilities study and have accepted their cost allocations. The second curve labeled "IA completed" shows the projection of capacity assuming inclusion of projects that are identified on the NYISO Interconnection Queue as having completed an Interconnection Agreement ("IA") as of May 2018.

Appendix 1 is based on the "Proposed Generator Additions & CRIS Requests" table (Table IV-1) of the 2018 Gold Book and has been revised to include re-ratings and deactivations. The appendices, including appendices 1A and 1B, detail the units under consideration for the capability projections. The firm capacity backed contracts that are associated with UDRs are included under the net purchases.

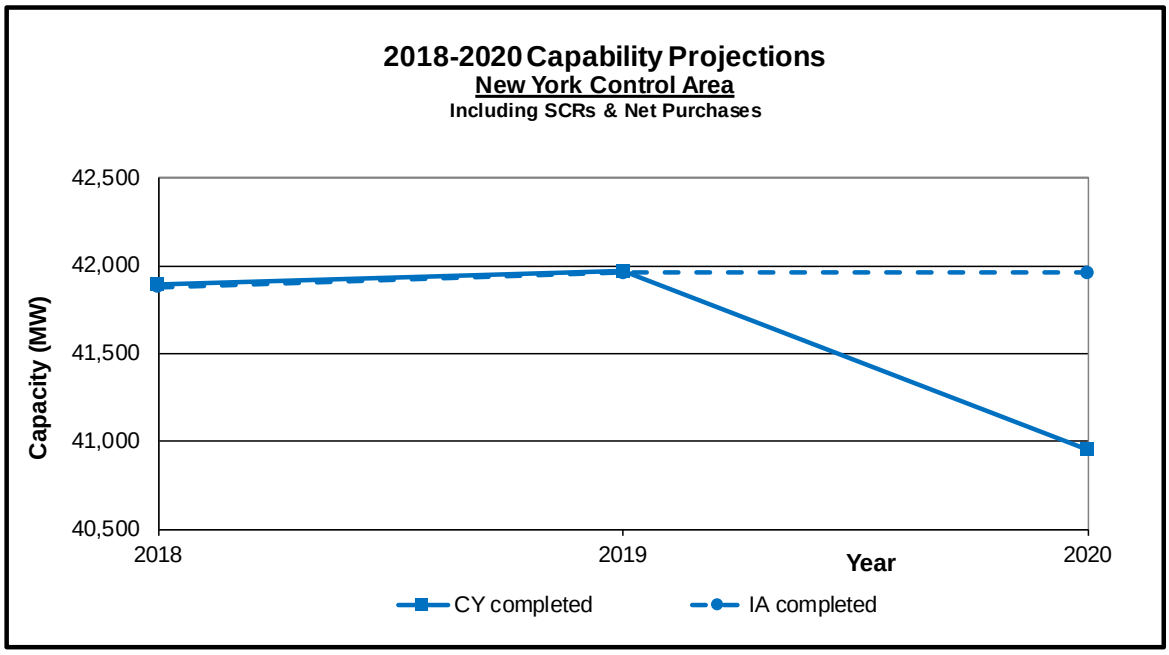

Figure 5. Capability projections for the New York Control Area

[14] The capacities listed include wind units at their full rated value as provided in the 2018 Gold Book under Table III-3a.

[15] Net purchases are long-term firm purchases less long-term firm sales. Firm purchases include grandfathered imports and Unforced Capacity Deliverability Rights (UDRs) with firm contracts.

Figures 6, 7, and 8 show the capability projections under the two cases as described above for New York City, Long Island, and the G-J Locality, respectively. It can be seen from Figure 7 that both cases for Long Island overlap. In addition, there are no capacity additions identified for Long Island.

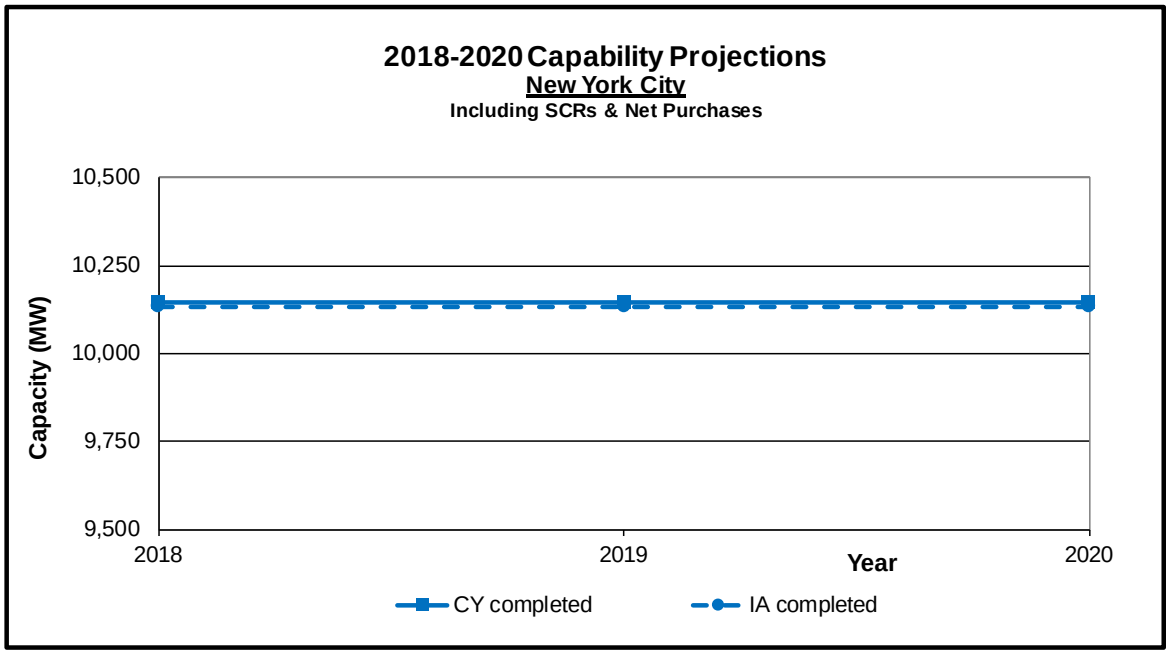

Figure 6. Capability projections for New York City

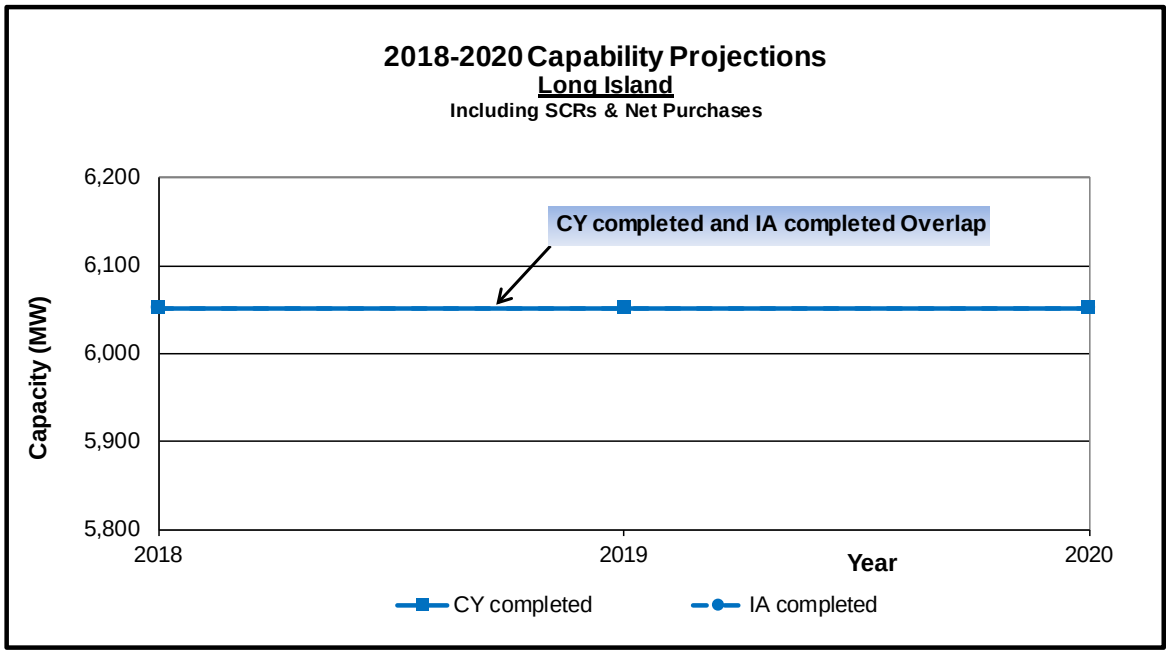

Figure 7. Capability projections for Long Island

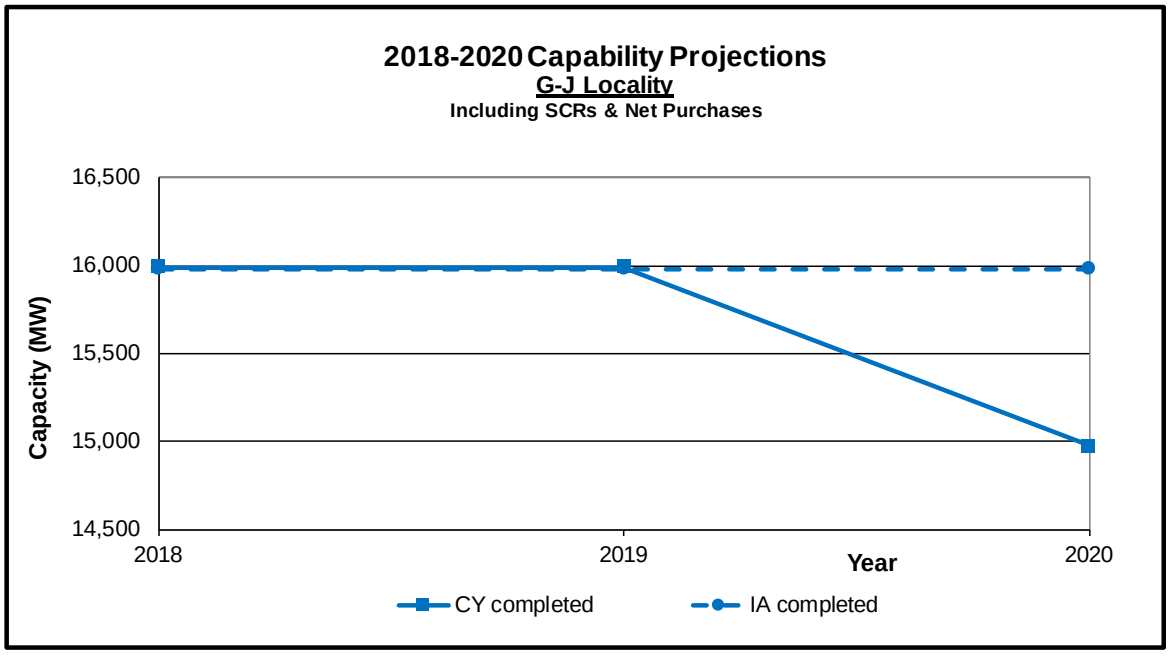

Figure 8. Capability projections for G-J Locality

RESERVE MARGIN LEVELS

From previous figures of projected load forecast and capability, the projections of NYCA installed capacity reserve margin and the capacity-to-load ratios for Localities are derived for the period of 2018-2020, as shown in Figures 9 through 16.

In the analysis, both base cases of "CY completed" and "IA completed" are considered against the baseline forecast of peak load. The IRM and LCRs over the assessment period are assumed to be the same as current requirements for the NYCA IRM and for the LCRs for Localities, respectively.

An Extreme case assuming no proposed generator additions are available during the assessment period is also examined under the baseline forecast of peak load.

In addition to the scenario with the baseline forecast of peak load, the "CY completed" and "IA completed" cases are also evaluated under the extreme scenario utilizing the 90th percentile forecast of peak load.

Figure 9 indicates that an assumed 18.2% NYCA IRM would be met throughout the assessment period for all cases with the baseline forecast of peak load, even without any proposed capacity additions. In the scenario of a 90th percentile forecast of peak load, based on a deterministic assessment that only uses expected New York Control Area resources, as shown in Figure 10, the 18.2% IRM would still be met throughout the assessment period.

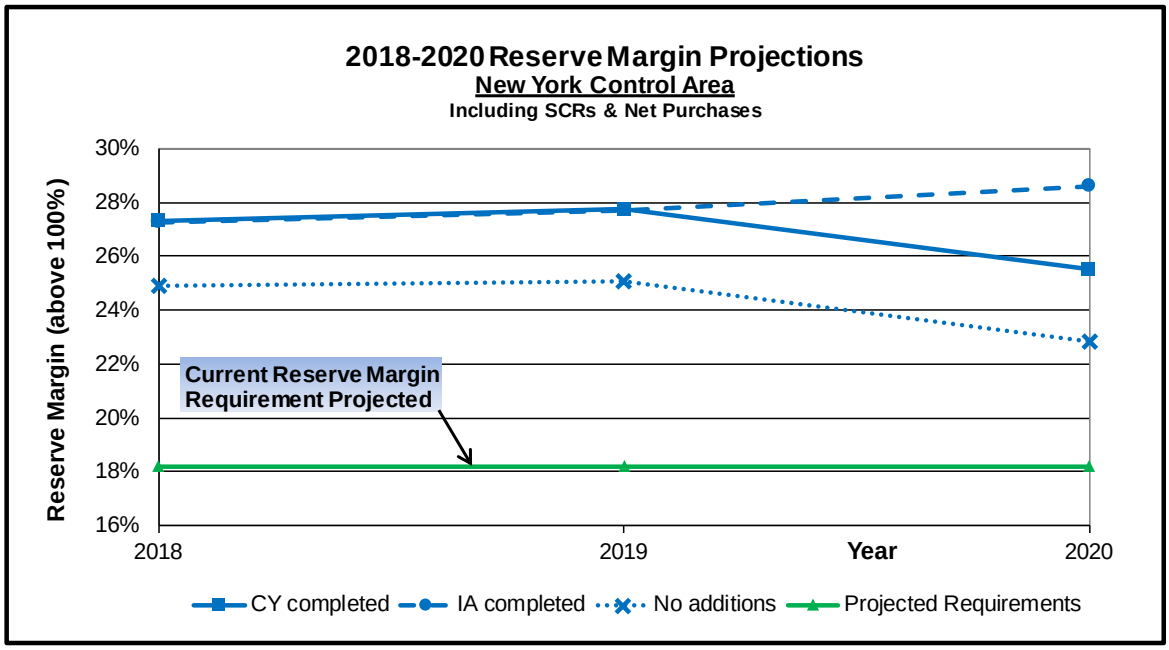

Figure 9. Reserve margin projections for the New York Control Area

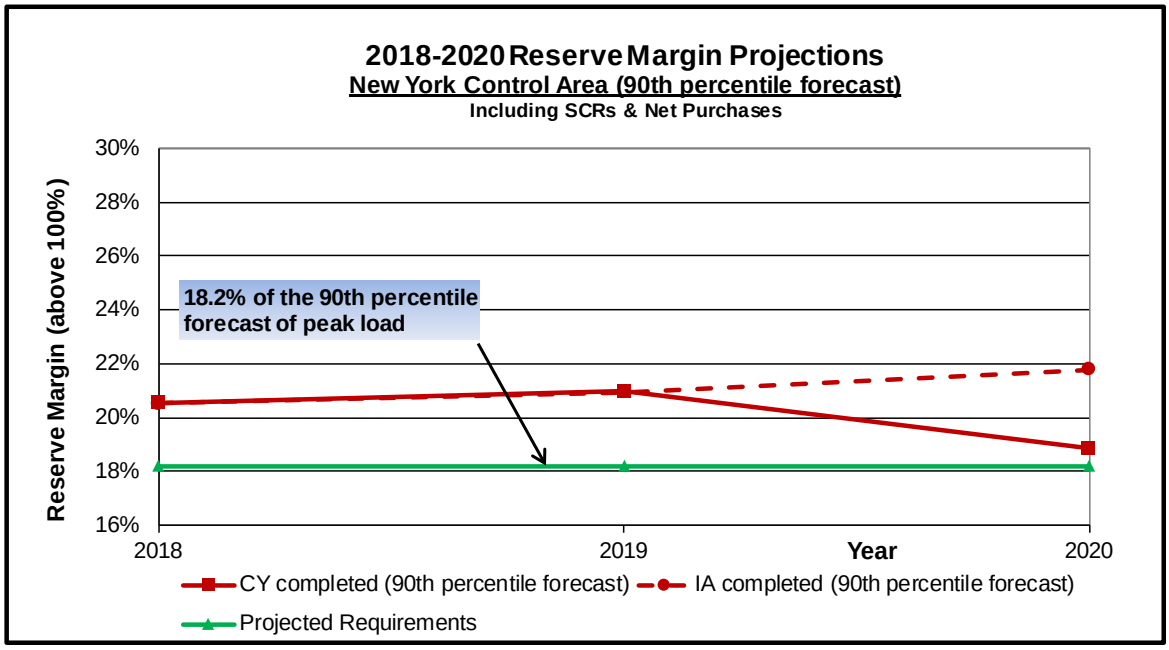

Figure 10. Reserve margin projections for the New York Control Area (high load forecast)

Figure 11 shows that New York City would meet an 80.5% LCR throughout the assessment period with the baseline forecast of peak load for all cases, even without any proposed capacity additions. Under the scenario of a 90th percentile forecast of peak load, as shown in Figure 12, the 80.5% LCR for New York City would still be met for both the "CY completed" and "IA completed" cases throughout the assessment period.

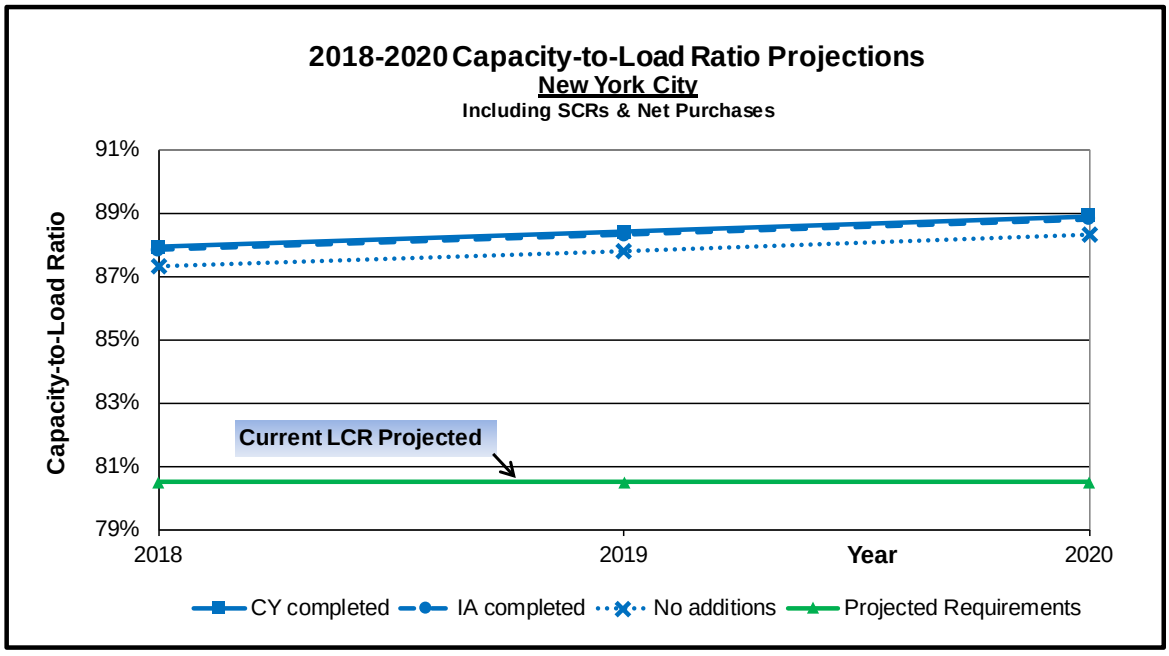

Figure 11. Capacity-to-Load Ratio Projections for New York City

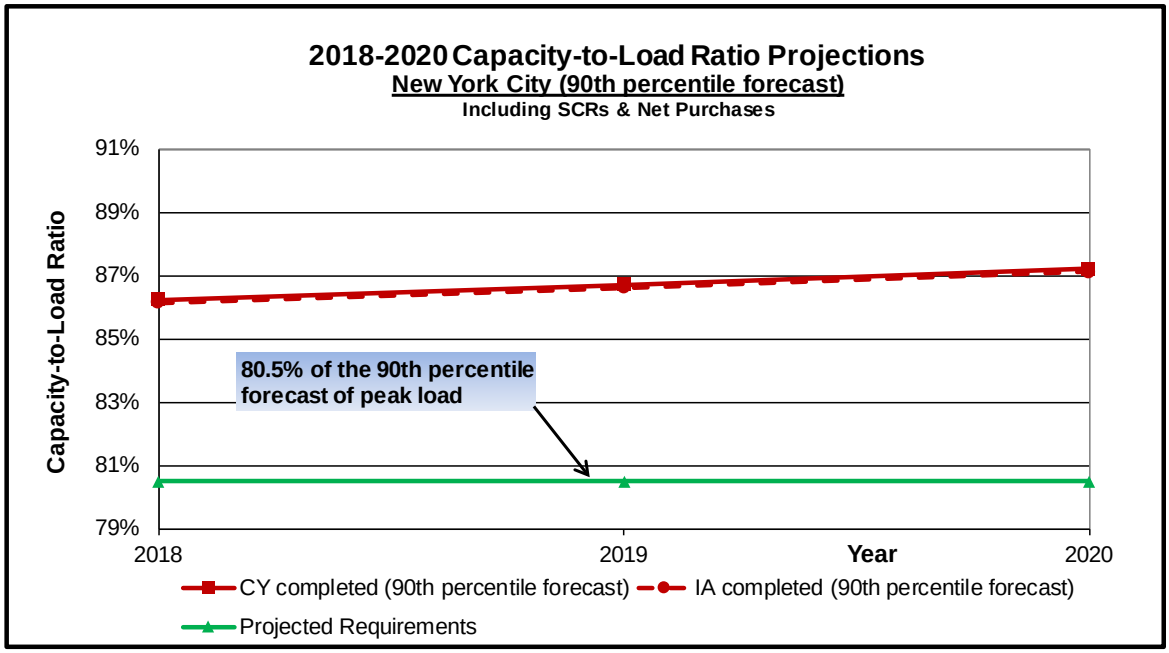

Figure 12. Capacity-to-Load Ratio Projections for New York City (high load forecast)

Figure 13 shows that Long Island would meet a 103.5% LCR throughout the assessment period with the baseline forecast of peak load for all cases. Since there are no capacity additions identified for Long Island during 2018-2020, all these cases are the same. Under the scenario of a 90th percentile forecast of peak load, as shown in Figure 14, the 103.5% LCR would still be met for both the "CY completed" and "IA completed" cases throughout the assessment period.

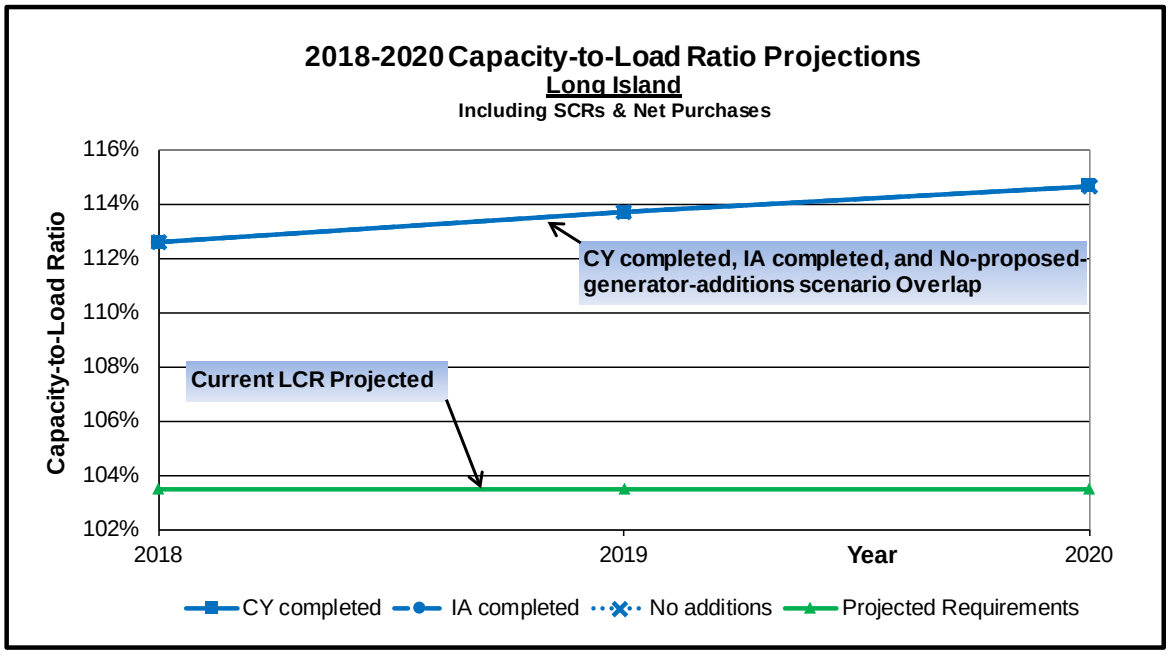

Figure 13. Capacity-to-Load Ratio Projections for Long Island

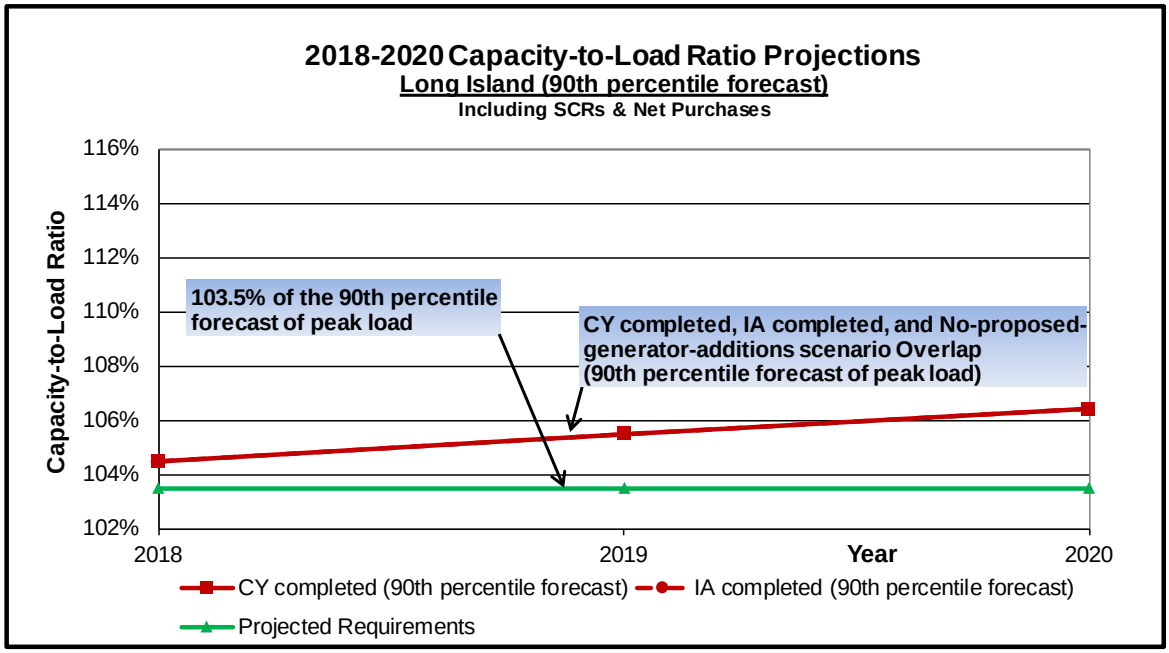

Figure 14. Capacity-to-Load Ratio Projections for Long Island (high load forecast)

Figure 15 shows that the G-J Locality would meet a 94.5% LCR throughout the assessment period for both the "CY completed" and "IA completed" base cases with the baseline forecast of peak load; however, it could not be met for the forecast of specific annual peak load in 2020 when Indian Point Energy Center Unit 2 is planned to retire if there are no proposed capacity additions.

Under the scenario of the 90th percentile forecast of peak load, as shown in Figure 16, a 94.5% LCR for the G-J Locality would still be met for the "IA completed" case throughout the assessment period. However, based on a deterministic assessment that only uses expected New York Control Area resources under the 90th percentile forecast of specific annual peak load in 2020 for the "CY completed" case, the 94.5% LCR for the G-J Locality could not be met. This is because the Cricket Valley Energy Center II units have an executed Interconnection Agreement, but have not completed a Class Year study, and therefore are excluded from the CY completed case.

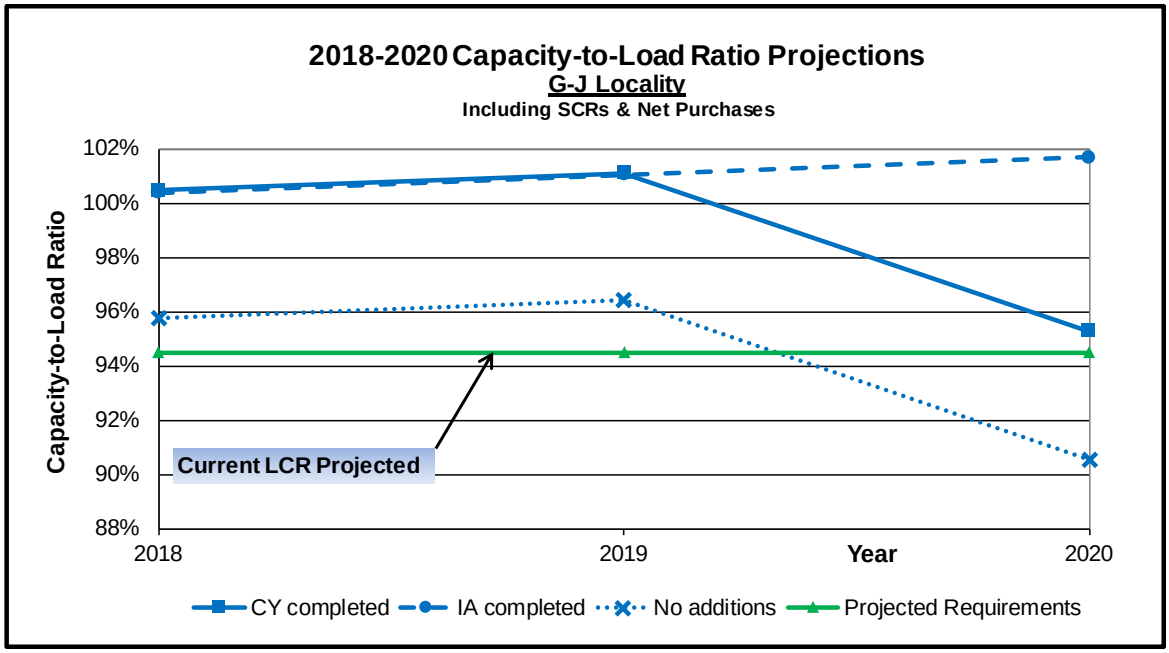

Figure 15. Capacity-to-Load Ratio Projections for G-J Locality

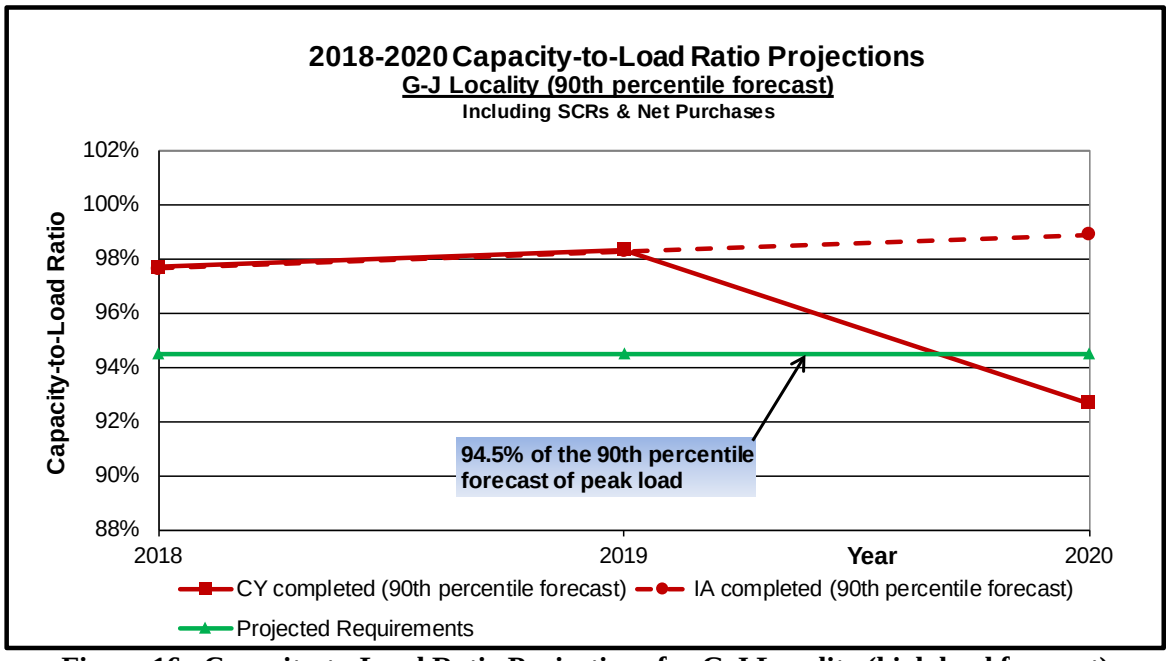

Figure 16. Capacity-to-Load Ratio Projections for G-J Locality (high load forecast)

CONCLUSION

With the baseline forecast of peak load, an 18.2% statewide IRM would be met throughout the 2018-2020 assessment period, even under the Extreme case (with no new resource additions during assessment period). This is because NYSRC's annual IRM study has adopted the Load Forecast Uncertainty ("LFU") in its probabilistic model, which includes the 90th percentile peak load demand forecast based on the baseline forecast data. To consider the results for specific forecast, such as the 90th percentile forecast of peak load, a deterministic assessment needs to be performed. Based on a deterministic assessment, an 18.2% IRM would still be met for the 90th percentile forecast of peak load throughout the assessment period.

With the baseline forecast of peak load and the proposed 2018-2020 resource additions, New York City would meet an LCR of 80.5% over the assessment period.

With the baseline forecast of peak load, Long Island would meet an LCR of 103.5% throughout the assessment period.

With the baseline forecast of peak load and the proposed 2018-2020 resource additions, the G-J Locality would meet an LCR of 94.5% over the assessment period.

It is worth noting that even without any resource additions, New York City and Long Island would still be able to meet their respective LCRs for the baseline forecast of peak load throughout the assessment period. The G-J Locality, however, could not meet an LCR of 94.5% for the forecast of specific annual peak load in 2020 without any resource additions since Indian Point Energy Center Unit 2 is planned to retire in 2020.

Similar to the IRM study, the probabilistic model of NYISO's annual LCR study has also adopted the LFU model in the baseline forecast data. To consider a specific forecast, such as the 90th percentile forecast of peak load, a deterministic assessment needs to be performed. Based on a deterministic assessment of the 90th percentile forecast of peak load and the proposed 2018-2020 resource additions, New York City and Long Island would still meet LCRs of 80.5% and 103.5% throughout the assessment period, respectively. The G-J Locality would also meet an LCR of 94.5% for the 90th percentile forecast of peak load with the proposed 2018-2020 resource additions in the IA completed case throughout the assessment period; however, without the Cricket Valley Energy Center II units, which are under construction and have an executed Interconnection Agreement, but have not completed a Class Year study, the G-J Locality could not meet an LCR of 94.5% for the 90th percentile forecast of specific annual peak load in 2020 based on a deterministic assessment that only considers expected New York Control Area resources.

It is important to note that any deterministic assessment, including the Extreme case utilizing the baseline forecast of peak load and all extreme scenarios utilizing the 90th percentile forecast of peak load, only provide limited "what if" information and, without a probabilistic assessment, do not test resource adequacy.

Appendix 1*

Proposed Resource Changes

QUEUE POS.	OWNER / OPERATOR	STATION UNIT	ZONE	DATE	CRIS (MW)	SUMMER (MW)	UNIT TYPE	CLASS YEAR	NOTES	Increase of Lessor of CRIS & Summer DMNC
Generator Additions										
251	CPV Valley, LLC	CPV Valley Energy Center	G	Feb 2018	680.0	677.6	Combined Cycle	2011	(1)	677.6
N/A	Cubit Power One Inc.	Arthur Kill Cogen	J	Apr 2018	11.1	11.1	Internal Combustion			11.1
395	Copenhagen Wind Farm , LLC	Copenhagen Wind	E	Nov 2018	79.9	79.9	Wind Turbines	2015	(1)	79.9
444	Cricket Valley Energy Center, LLC	Cricket Valley Energy Center II	G	Jan 2020	1020.0	1020.0	Combined Cycle	2017	(1)	1020.0
Generator Re-ratings										
461	Consolidated Edison Co. of NY, Inc.	East River 1 Uprate	J	In Service	160.5	155.1	Steam Turbine		(1)	2.0
462	Consolidated Edison Co. of NY, Inc.	East River 2 Uprate	J	In Service	162.4	156.0	Steam Turbine		(1)	2.0
510	Bayonne Energy Center	Bayonne Energy Center II	J	In Service	512.0	602.9	Jet Engine		(1)	53.8
403	PSEG Energy Resource & Trade, LLC	Bethlehem Energy Center	F	2017-2019	835.0	835.0	Combined Cycle	2015	(1)	47.8
Generator Deactivations (Retirement / Mothballing / IIFO)										
	Helix Ravenswood, LLC	Ravenswood 2-1	J	4/1/2018	40.4	30.6	Jet Engine			-30.6
	Helix Ravenswood, LLC	Ravenswood 2-2	J	4/1/2018	37.6	32.0	Jet Engine			-32.0
	Helix Ravenswood, LLC	Ravenswood 2-3	J	4/1/2018	39.2	30.7	Jet Engine			-30.7
	Helix Ravenswood, LLC	Ravenswood 2-4	J	4/1/2018	39.8	30.9	Jet Engine			-30.9
	Helix Ravenswood, LLC	Ravenswood 3-1	J	4/1/2018	40.5	30.7	Jet Engine			-30.7
	Helix Ravenswood, LLC	Ravenswood 3-2	J	4/1/2018	38.1	29.7	Jet Engine			-29.7
	Helix Ravenswood, LLC	Ravenswood 3-4	J	4/1/2018	35.8	29.8	Jet Engine			-29.8
	Lyonsdale Biomass, LLC	Lyonsdale	E	4/1/2018	20.2	19.3	Steam Turbine			-19.3
	Selkirk Cogen Partners, L.P.	Selkirk-I	F	5/5/2018	82.1	78.1	Combined Cycle			-78.1
	Selkirk Cogen Partners, L.P.	Selkirk-II	F	5/5/2018	291.3	282.1	Combined Cycle			-282.1
	Long Island Power Authority	Greenport GT1	K	6/6/2018	51.9	53.5	Jet Engine			-51.9
	Entergy Nuclear Power Marketing LLC	Indian Point 2	H	4/30/2020	1026.5	1018.5	Nuclear			-1018.5
GRAND TOTAL										**229.9**

* This table is modified from table IV-1, "Proposed Generator Additions & CRIS Requests" in the NYISO 2018 Gold Book.
(1) These projects are identified on the NYISO Interconnection Queue as having completed an Interconnection Agreement as of May 2018.

Appendix 1A – Determination of Annual Capacities

Units with Their Class Year Facilities Study Completed

	2018				2019				2020			
	NYCA	NYC	LI	G-J	NYCA	NYC	LI	G-J	NYCA	NYC	LI	G-J
2018 Gold Book	**38806.4**	**9631.9**	**5284.9**	**14764.0**	**38806.4**	**9631.9**	**5284.9**	**14764.0**	**38806.4**	**9631.9**	**5284.9**	**14764.0**
Lesser of CRIS & Summer DMNC	38581.4	9582.1	5297.4	14669.1	38581.4	9582.1	5297.4	14669.1	38581.4	9582.1	5297.4	14669.1
CPV Valley Energy Center	677.6			677.6	677.6			677.6	677.6			677.6
Arthur Kill Cogen	11.1	11.1		11.1	11.1	11.1		11.1	11.1	11.1		11.1
Copenhagen Wind					79.9				79.9			
Cricket Valley Energy Center II												
Reratings												
East River 1 Uprate	2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0		2.0
East River 2 Uprate	2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0		2.0
Bayonne Energy Center II	53.8	53.8		53.8	53.8	53.8		53.8	53.8	53.8		53.8
Bethlehem Energy Center	47.8				47.8				47.8			
Deactivations												
Ravenswood 2-1	-30.6	-30.6		-30.6	-30.6	-30.6		-30.6	-30.6	-30.6		-30.6
Ravenswood 2-2	-32.0	-32.0		-32.0	-32.0	-32.0		-32.0	-32.0	-32.0		-32.0
Ravenswood 2-3	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7
Ravenswood 2-4	-30.9	-30.9		-30.9	-30.9	-30.9		-30.9	-30.9	-30.9		-30.9
Ravenswood 3-1	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7
Ravenswood 3-2	-29.7	-29.7		-29.7	-29.7	-29.7		-29.7	-29.7	-29.7		-29.7
Ravenswood 3-4	-29.8	-29.8		-29.8	-29.8	-29.8		-29.8	-29.8	-29.8		-29.8
Lyonsdale	-19.3				-19.3				-19.3			
Selkirk-I	-78.1				-78.1				-78.1			
Selkirk-II	-282.1				-282.1				-282.1			
Greenport GT1	-51.9		-51.9		-51.9		-51.9		-51.9		-51.9	
Indian Point 2									-1018.5			-1018.5
Total:	38729.9	9436.6	5245.5	15201.2	38809.8	9436.6	5245.5	15201.2	37791.3	9436.6	5245.5	14182.7

Appendix 1B – Determination of Annual Capacities

Units with Their Interconnection Agreement Completed

	2018				2019				2020			
	NYCA	NYC	LI	G-J	NYCA	NYC	LI	G-J	NYCA	NYC	LI	G-J
2018 Gold Book	**38806.4**	**9631.9**	**5284.9**	**14764.0**	**38806.4**	**9631.9**	**5284.9**	**14764.0**	**38806.4**	**9631.9**	**5284.9**	**14764.0**
Lesser of CRIS & Summer DMNC	38581.4	9582.1	5297.4	14669.1	38581.4	9582.1	5297.4	14669.1	38581.4	9582.1	5297.4	14669.1
CPV Valley Energy Center	677.6			677.6	677.6			677.6	677.6			677.6
Arthur Kill Cogen												
Copenhagen Wind					79.9				79.9			
Cricket Valley Energy Center II									1020.0			1020.0
Reratings												
East River 1 Uprate	2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0		2.0
East River 2 Uprate	2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0		2.0
Bayonne Energy Center II	53.8	53.8		53.8	53.8	53.8		53.8	53.8	53.8		53.8
Bethlehem Energy Center	47.8				47.8				47.8			
Deactivations												
Ravenswood 2-1	-30.6	-30.6		-30.6	-30.6	-30.6		-30.6	-30.6	-30.6		-30.6
Ravenswood 2-2	-32.0	-32.0		-32.0	-32.0	-32.0		-32.0	-32.0	-32.0		-32.0
Ravenswood 2-3	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7
Ravenswood 2-4	-30.9	-30.9		-30.9	-30.9	-30.9		-30.9	-30.9	-30.9		-30.9
Ravenswood 3-1	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7	-30.7	-30.7		-30.7
Ravenswood 3-2	-29.7	-29.7		-29.7	-29.7	-29.7		-29.7	-29.7	-29.7		-29.7
Ravenswood 3-4	-29.8	-29.8		-29.8	-29.8	-29.8		-29.8	-29.8	-29.8		-29.8
Lyonsdale	-19.3				-19.3				-19.3			
Selkirk-I	-78.1				-78.1				-78.1			
Selkirk-II	-282.1				-282.1				-282.1			
Greenport GT1	-51.9		-51.9		-51.9		-51.9		-51.9		-51.9	
Indian Point 2									-1018.5			-1018.5
Total:	38718.8	9425.5	5245.5	15190.1	38798.7	9425.5	5245.5	15190.1	38800.2	9425.5	5245.5	15191.6