2019 Capacity Withholding Analysis

1. All Capacity Areas in the NYCA

This report addresses potential withholding issues in the NYISO-administered capacity auctions for all four capacity areas during the period of November 2018 to October 2019: ROS, NYC, the G-J Locality, and LI. For purposes of this report, in order to identify whether any potential withholding occurred, the NYISO analyzed the differences between available capacity[1] and the supply committed through self-supply, bilateral transactions, and the NYISO-administered auctions. In particular, the NYISO examined:

- The NYCA capacity that was available to be offered into the ICAP Spot Market Auctions, but was not offered ("unoffered capacity"),
- Available NYCA capacity that was offered into the ICAP Spot Market Auctions but was not sold ("unsold capacity"),
- Unoffered capacity as a percentage of available capacity, and
- Unsold capacity as a percentage of offered capacity.

When capacity is available but not offered, it is an indication that physical withholding may have occurred. Similarly, if available capacity is offered at a price that causes it to not clear, it is an indication of possible economic withholding. The amounts of unoffered and unsold capacity are determined from the ICAP Spot Market Auction results because this auction is the last opportunity for an Installed Capacity Supplier to sell its available capacity. The existence of unoffered and unsold capacity, however, does not necessarily imply the intent to manipulate market prices.

As reflected in the NYISO's previous reports on the Installed Capacity Demand Curves, patterns of unsold capacity have varied across the three Localities and the NYCA. For the entire NYCA, there generally has been more unsold capacity in Winter months than Summer months, due in part to lower prices in the Winter months. The seasonal monthly average of unsold MW for the Winter 2018-2019 Capability Period for the entire NYCA was 359 MW compared 276 MW in the Winter 2017-2018 Capability Period. The seasonal monthly average amount of unsold MW for the Summer 2019 Capability Period for the entire NYCA was 174.3 MW, while it was 0 MW in the Summer 2018 Capability Period.

In Long Island, there was a monthly average of 1.0 MW of unsold capacity in the Winter 2018-2019 Capability Period, compared to 0.02 MW in the Winter 2017-2018 Capability Period; and 0 MW in the Summer 2019 Capability Period compared to also 0 MW in the Summer 2018 Capability Period.

In NYC, the seasonal monthly average amount of unsold MW for the Winter 2018-2019 was 188 MW, compared to 43 MW for Winter 2017-2018 Capability Period. For the Summer 2019 and Summer 2018 Capability Periods the seasonal monthly average is zero MW.

In the G-J Locality, the monthly average of unsold capacity was 38 MW in Winter 2017-2018 and 39 MW in Winter 2018-2019. There was no unsold capacity in Summer 2018 or Summer 2019.

[1] Available capacity is defined as the lesser of the NYISO-accepted DMNC and the Capacity Resource Interconnection Service ("CRIS") MW value, with the Equivalent Demand Forced Outage Rates ("EFORd") reduction applied.

There are three types of capacity auctions in each Capability Period: A Capability Period Auction (also referred to as the "strip auction"), six Monthly Auctions, and six ICAP Spot Market Auctions. Available capacity may be offered into any or all of the auctions. There are three distinct minimum ICAP requirements: one each for the NYC, G-J, and LI Localities, as well as one for the NYCA as a whole. LSEs with Load in NYC, G-J, or LI Localities are required to procure minimum levels of capacity that is electrically located within the respective Locality – the "LCRs" in terms of Unforced Capacity, *i.e.*, the Locational Minimum Unforced Capacity Requirement. Such capacity is also credited toward each NYC, LI, and G-J LSE's overall NYCA obligation. The NYISO establishes the NYCA Minimum Installed Capacity Requirement and the LCRs annually.

The Services Tariff does not require Installed Capacity Suppliers to offer UCAP into the ICAP markets except for certain suppliers in Mitigated Capacity Zones (*i.e.*, NYC and the G-J Locality). Until the implementation of the ICAP market power mitigation measures set forth in Attachment H of the Services Tariff, which were effectuated in May 2008, the majority of capacity in NYC – that of the "Divested Generation Owners" – had been subject to Commission-approved ICAP mitigation measures that imposed bid caps and required the units' capacity to be offered into the ICAP auctions. The Commission's March 7, 2008 Order[2] removed the requirements unique to the Divested Generation Owners and approved mitigation measures applicable to all In-City capacity. The March 7, 2008 Order effectuated new In-City mitigation measures, based on Pivotal Supplier determinations combined with offering conduct and price impact thresholds, to determine whether market power had been exercised. ICAP market power mitigation measures became effective for the G-J Locality concurrent with its implementation. These measures for NYC and G-J Locality are set forth in Section 23.4.5 (Attachment H) of the Services Tariff (as revised over time, "Supply-side Mitigation Measures").

In developing the information for this report, the NYISO examined auction outcomes of the Capability Periods from Summer 2007, which began May 1, 2007, through Summer 2019, which ended October 31, 2019. Since the capacity product transacted in the NYISO-administered ICAP auctions is UCAP, the following information was examined:

- Certification data, reflecting all certified MW of UCAP electrically located in New York available to supply capacity to the NYCA.

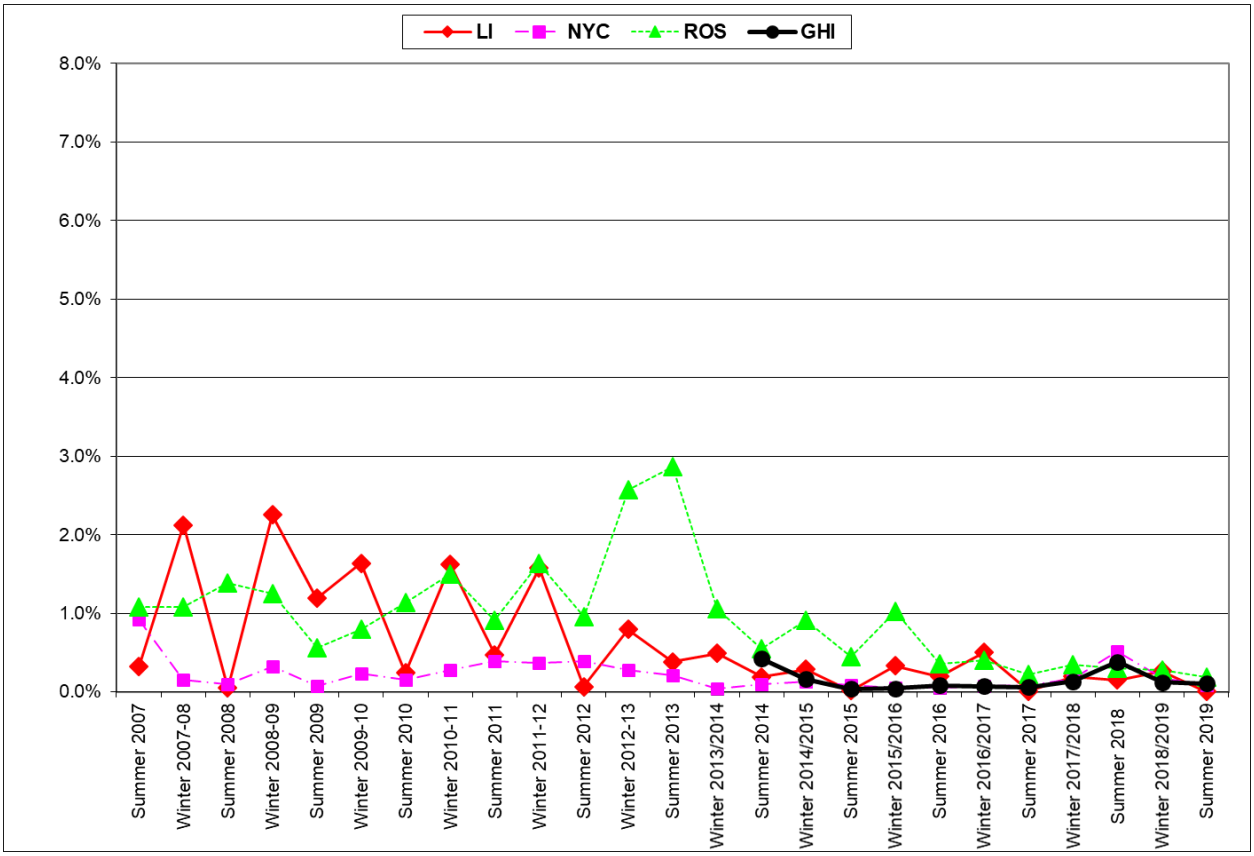
- The amount of UCAP supplied, which includes UCAP sold in any of the NYISO ICAP auctions, UCAP certified as self-supplied against an LSE's Unforced Capacity obligation, and UCAP committed through bilateral transactions. This includes external capacity that was supplied in any of the foregoing manners.

2. Unoffered and Unsold Capacity

Chart 1 presents seasonal averages of unoffered capacity as a percentage of available Capacity for each of the four capacity areas.

[2] *See New York Independent System Operator, Inc.*, Docket No. EL07-39-000, Order Conditionally Approving Proposal, 122 FERC ¶ 61,211 (2008).

Chart 1: Average Percent of Unoffered MW



The LI Locality has fairly consistent seasonal fluctuations in the amounts of unoffered capacity, which can be seen in Chart 1. The LI Locality is characterized by procurement chiefly through bilateral transactions and self-supply. The amount of unoffered capacity in the LI Locality fluctuates between 0.01% and 2.3%.

In the NYC Locality, prior to the Summer 2008 Capability Period, the low level of unoffered capacity was principally due to the offer requirement applicable to the Divested Generation Owners. Beginning with the Summer 2008 Capability Period, the near absence of unoffered capacity can be attributed to the Supply-side Mitigation Measures effectuated in 2008.

The G-J Locality became effective beginning in May 2014. Initially, the level of unoffered capacity was at the level of that in ROS, but fell to near zero.

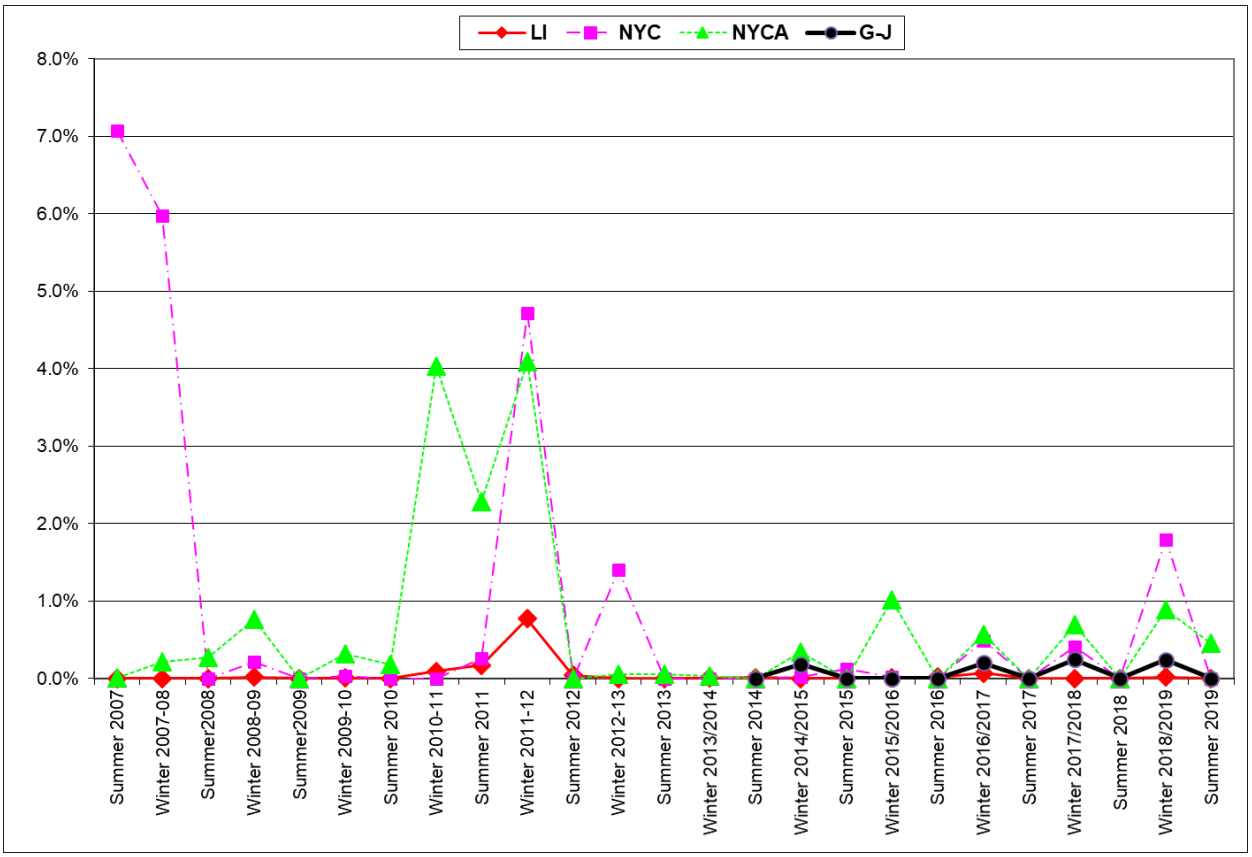
In ROS the unoffered MW for the Winter 2018-2019 and Summer 2019 Capability Periods was consistently below 0.5%.[3]

Chart 2 displays unsold capacity as a percent of available UCAP in each of the four capacity areas, which has been below 2% for the past fifteen Capability Periods.[4]

[3] The definition of Rest of State prior to the Summer 2014 Capability Period was Load Zones A though I, and beginning with the Summer 2014 Capability Period is Load Zones A through F.

[4] Section 4.3 of this report provides information and analysis of the unsold capacity in ROS.

Chart 2: Average Percent of Unsold MW



For all Capability Periods beginning with the Summer 2007 Capability Period, nearly all Long Island offered capacity was sold, except for Winter 2011-2012. In NYC, the average amount of unsold capacity as a percentage of available capacity trended at near zero levels from the start of the Summer 2008 Capability Period, except for the Winter 2011-2012, Winter 2012-2013 and Winter 2018-2019 Capability Periods when some offered capacity did not clear because it was offered at a price greater than the UCAP Offer Reference Level. The UCAP Offer Reference Level is the price at which the ICAP Spot Market Auction would clear if all available capacity in a Mitigated Capacity Zone was offered and sold in the ICAP Spot Market Auction. Note that the amount of unsold UCAP is reported based on the Resource's offer price and whether the MW would have cleared against the ICAP Demand Curve for the smallest Locality in which the Resource is electrically located. Thus, the reporting of unsold UCAP within a Locality will not necessarily equal the MW that were offered and were actually sold. That is, MW that would not have cleared at the Market-Clearing Price of the smallest Locality in which a Resource is electrically located if that Market-Clearing Price had been determined at the intersection of the UCAP supply and demand curves for that Locality, would be reported as an unsold MW even if the offer of MW cleared because the Market-Clearing Price was set at a higher level due to the capacity price cascading rules that apply to Localities. For example, if the price of capacity that would have been determined at the intersection of the supply curve for UCAP in New York City and the UCAP Demand Curves for New York City is $10/kW-mo., then MW of an offer from a Resource in New York City that would not have been sold at that price will be included in this report even if the MW did clear because the Market-Clearing Price of capacity for the G-J Locality or for the NYCA equaled or exceeded the offer price.

The NYCA Minimum Installed Capacity Requirement and G-J LCR decreased since last Capability Year, while the LCRs of NYC and LI increased. Table 1 summarizes these values for NYC, G-J, LI, and the NYCA over the past 12 years.

Table 1: Minimum Installed Capacity Requirements (%)[5]

Capability Year	NYC	G-J	LI	NYCA
2007/2008	80	-	99	116.5
2008/2009	80	-	94	115
2009/2010	80	-	97.5	116.5
2010/2011 (May)	80	-	102	118
2010/2011 (June-April)	80	-	104.5	118
2011/2012	81	-	101.5	115.5
2012/2013	83	-	99	116
2013/2014	86	-	105	117
2014/2015	85	88	107	117
2015/2016	83.5	90.5	103.5	117
2016/2017	80.5	90	102.5	117.5
2017/2018	81.5	91.5	103.5	118
2018/2019	80.5	94.5	103.5	118.2
2019/2020	82.8	92.3	104.1	117

Table 2 displays the breakdown of unsold capacity for each Locality and NYCA. These unsold MW were not cleared in the Spot Market Auction. Table 2 also displays the unoffered capacity values for MW that came from NYC, GHI, LI, and ROS to give a full representation of the data that underlies this report.

Beginning with November 2018, the amount of unoffered MW remained low in NYC, LI, and G-J Locality, totaling 214 MW in the Winter 2018-2019 and 102 MW in the Summer 2019, compared to 198 MW in Winter 2017-2018 and 401 MW in Summer 2018.

The total amount of unsold MW in NYC, G-J and LI was 1,371 MW in the Winter 2018/2019, compared to 487 MW in Winter 2017-2018, and zero MW in both Summer 2019 and Summer 2018.

Section 4.2 discusses explanations provided by Market Participants for unoffered MW in ROS in Winter 2018-2019 and Summer 2019. Section 4.3 presents the Market Participant explanations for and an analysis of unsold MW in ROS in the Winter 2018-2019 and Summer 2019.

[5] The New York State Reliability Council issues an annual IRM Study Report, which presents a base case calculating the lowest feasible amount of capacity for the NYCA in conformance with the resource adequacy criterion. Each report includes a comparison of the IRM and LCR values to the previous year along with an explanation of each parameter that contributed to the changes. The NYISO determines the actual LCRs for each Locality taking into consideration changes that have occurred since the Reliability Council approved the IRM Study Report. The 2019 IRM Study Report covering the period of May 2019 through April 2020 is available at: <http://www.nysrc.org/NYSRC_NYCA_ICR_Reports.html>.

Table 2: Unoffered and Unsold MW

Month	Unoffered				Unsold			
	NYC	GHI	LI	ROS	NYC	G-J	LI	NYCA
Nov-18	21.9	2.0	0.0	43.3	176.7	39.2	0.0	550.5
Dec-18	15.3	1.8	89.6	84.9	214.9	39.2	0.0	212.2
Jan-19	17.8	1.5	0.4	97.1	183.2	39.2	0.1	98.2
Feb-19	19.1	0.8	0.1	115.3	183.9	39.2	2.7	215.5
Mar-19	22.1	1.3	5.5	26.0	180.5	39.2	0.1	520.5
Apr-19	13.4	1.3	0.1	98.1	190.1	39.2	3.1	556.7
May-19	24.0	19.3	0.0	30.1	0.0	0.0	0.0	200.8
Jun-19	24.0	6.6	0.0	39.1	0.0	0.0	0.0	0.0
Jul-19	0.3	3.8	0.0	50.5	0.0	0.0	0.0	234.1
Aug-19	1.2	3.1	0.4	118.1	0.0	0.0	0.0	98.0
Sep-19	0.9	7.4	0.8	54.3	0.0	0.0	0.0	201.6
Oct-19	1.4	7.5	0.8	46.2	0.0	0.0	0.0	311.0

3. New York City and G-J Localities

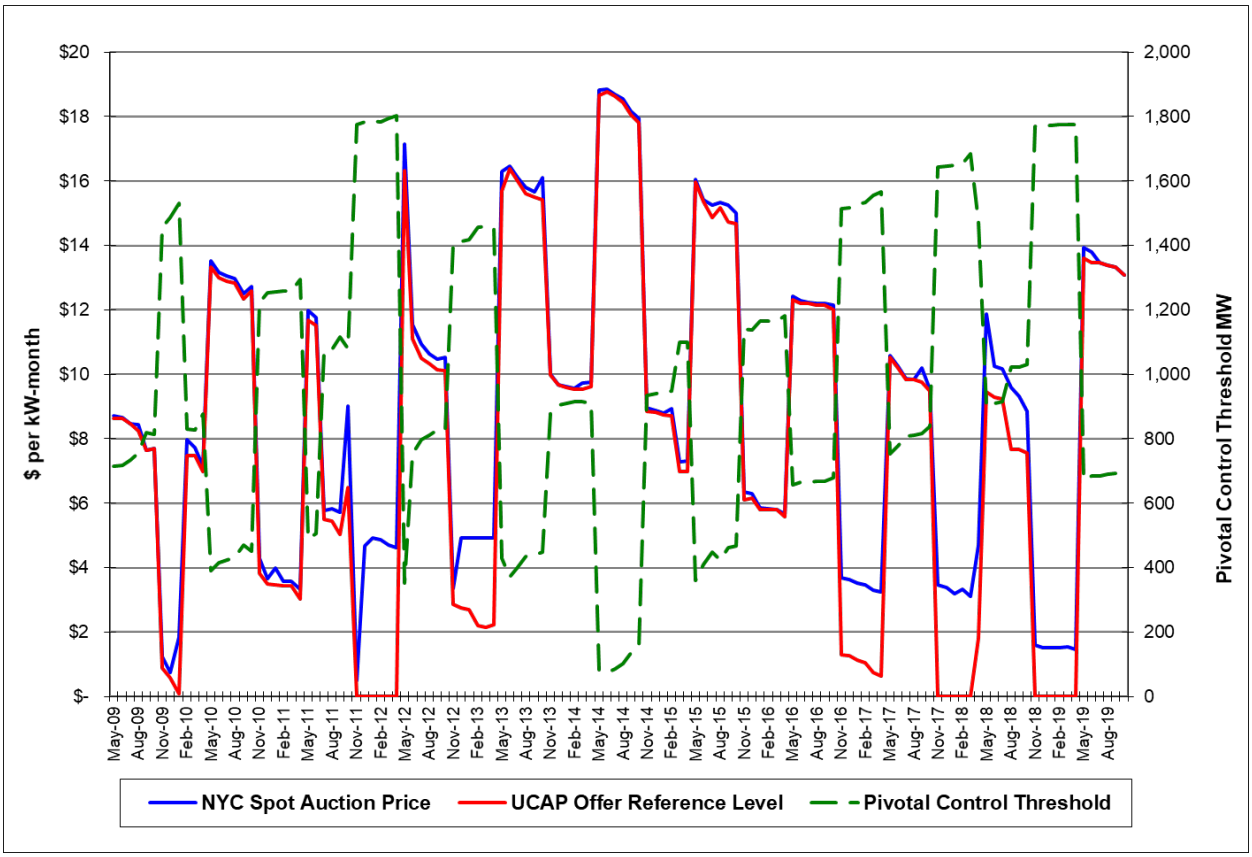
To administer the Supply-side Mitigation Measures, the NYISO identifies Pivotal Suppliers by examining the NYC UCAP and G-J Locality UCAP that each ICAP Supplier, along with its Affiliated Entities, Controls in excess of the pivotal control threshold.[6] The UCAP under the Control of Pivotal Suppliers ("Mitigated UCAP") must be offered into the ICAP Spot Market Auction at a price at or below the lesser of the UCAP Offer Reference Level or the ICAP Supplier's Going-Forward Costs determined by the NYISO ("GFCs"). Chart 3 and Chart 5 illustrate the effects of the Supply-side Mitigation Measures. The UCAP Offer Reference Level, becomes the price cap that the Pivotal Supplier must offer at or below in the ICAP Spot Market Auction, unless the Pivotal Supplier's GFCs are higher.

The level of unoffered and unsold MW can be inferred from Chart 3 and Chart 5 by comparing the Locality Spot Market Auction price to the UCAP Offer Reference Level, while Chart 4 and Chart 6 depict the levels of available generator and SCR UCAP in the Locality. The difference between the ICAP Spot Market Auction clearing price and UCAP Offer Reference Level can be attributed to Locality capacity that is either not offered or is offered at a price above the UCAP Offer Reference Level. Note that the Locality Spot Market Auction price will diverge from the UCAP Offer Reference Level when the NYCA ICAP Spot Market Auction sets the Locality ICAP Spot Market Auction price.[7] This divergence is the result of the auction rules, and is not caused by unoffered or unsold Locality Capacity.

[6] *See* Market Services Tariff Sections 23.2.1 and 23.4.5.

[7] In the 2015/2016 Capability Year, the NYCA ICAP price set the Long Island ICAP price in May 2016 and June 2016.

Chart 3: NYC Mitigation Results[8]



[8] Per Services Tariff Section 23.2, a "Pivotal Supplier" in NYC needs to control at least 500 MW of Unforced Capacity, and a specified portion of the capacity necessary to meet the NYC LCR in an ICAP Spot Market Auction.

Chart 2: NYC Generator and SCR UCAP

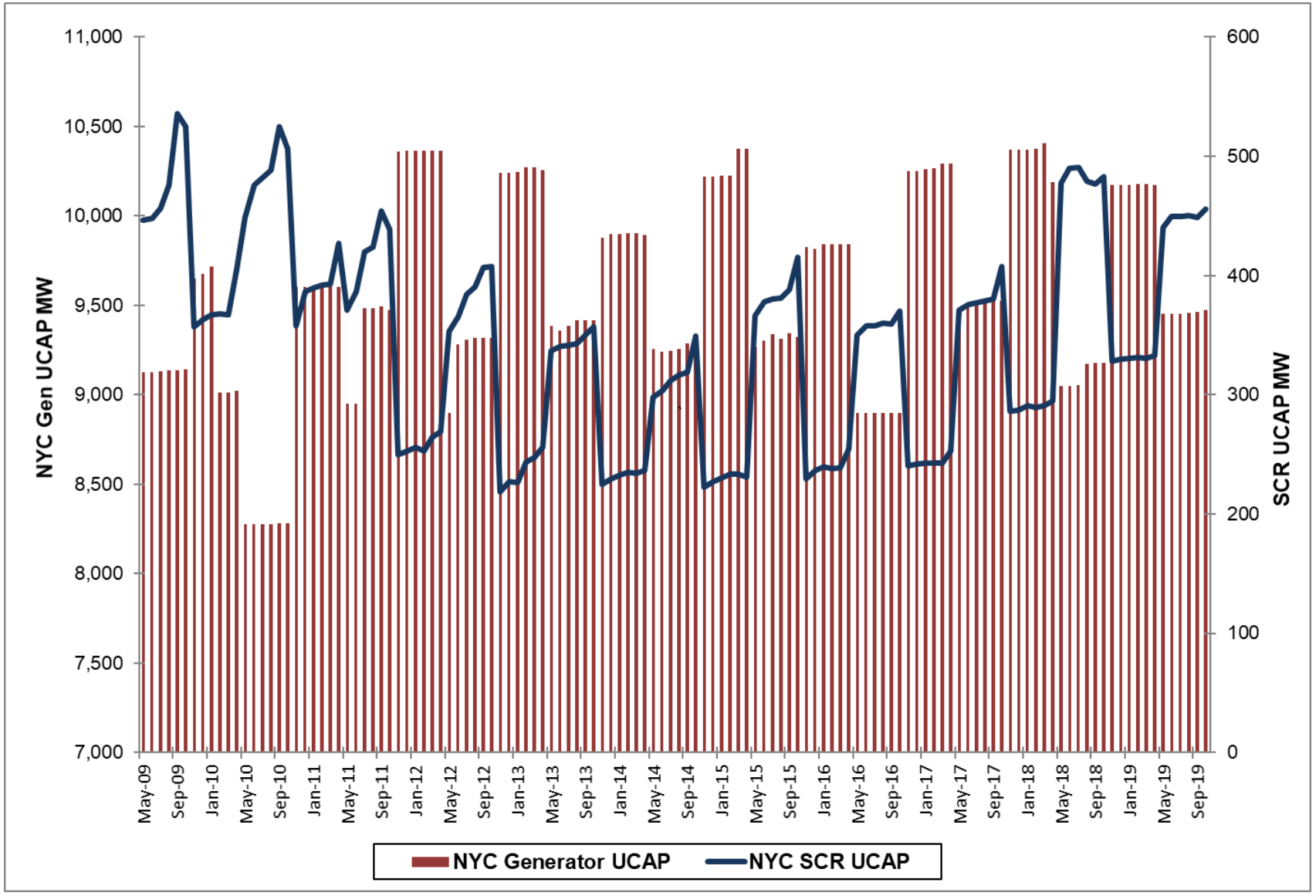


Chart 5: G-J Locality Mitigation Results

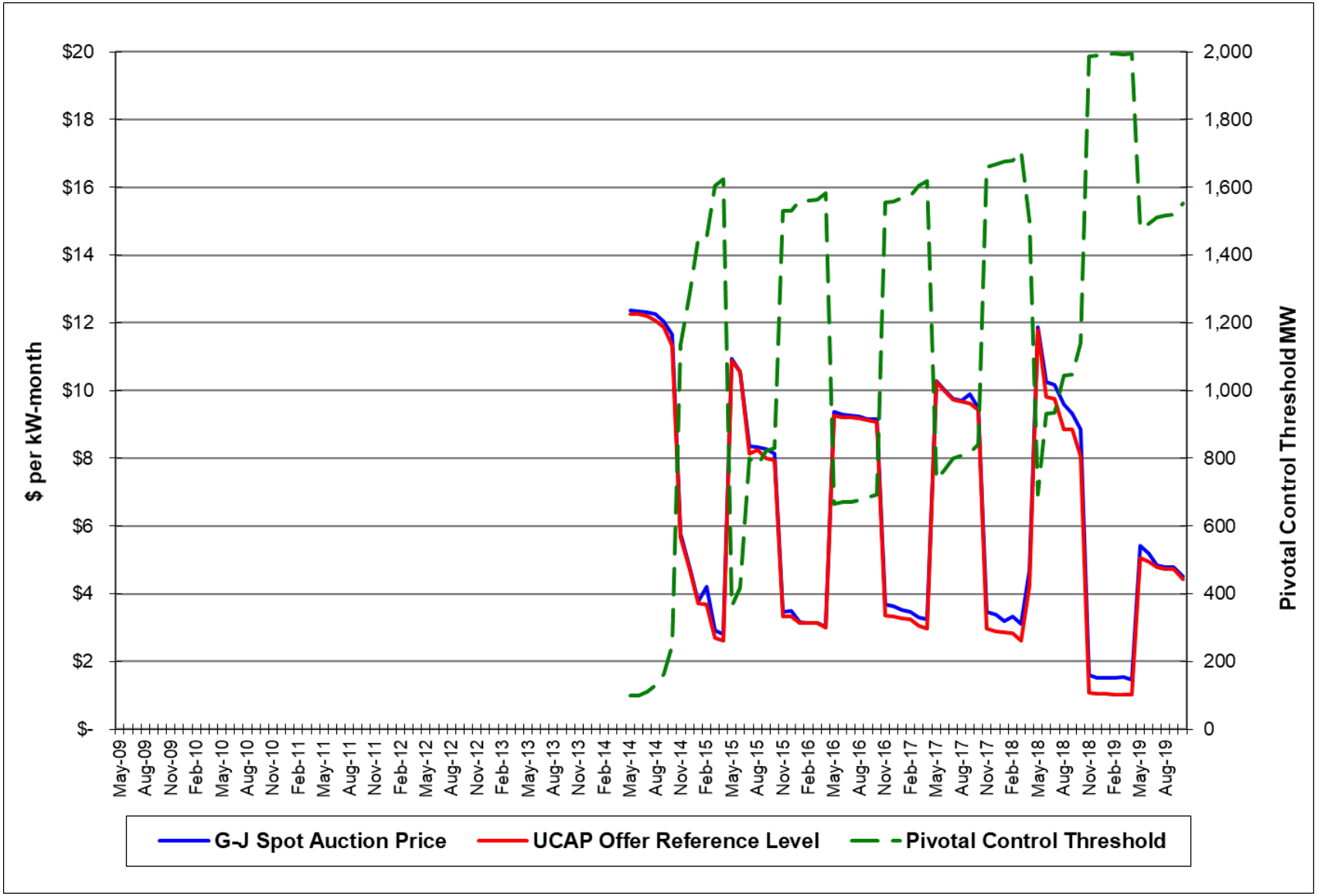
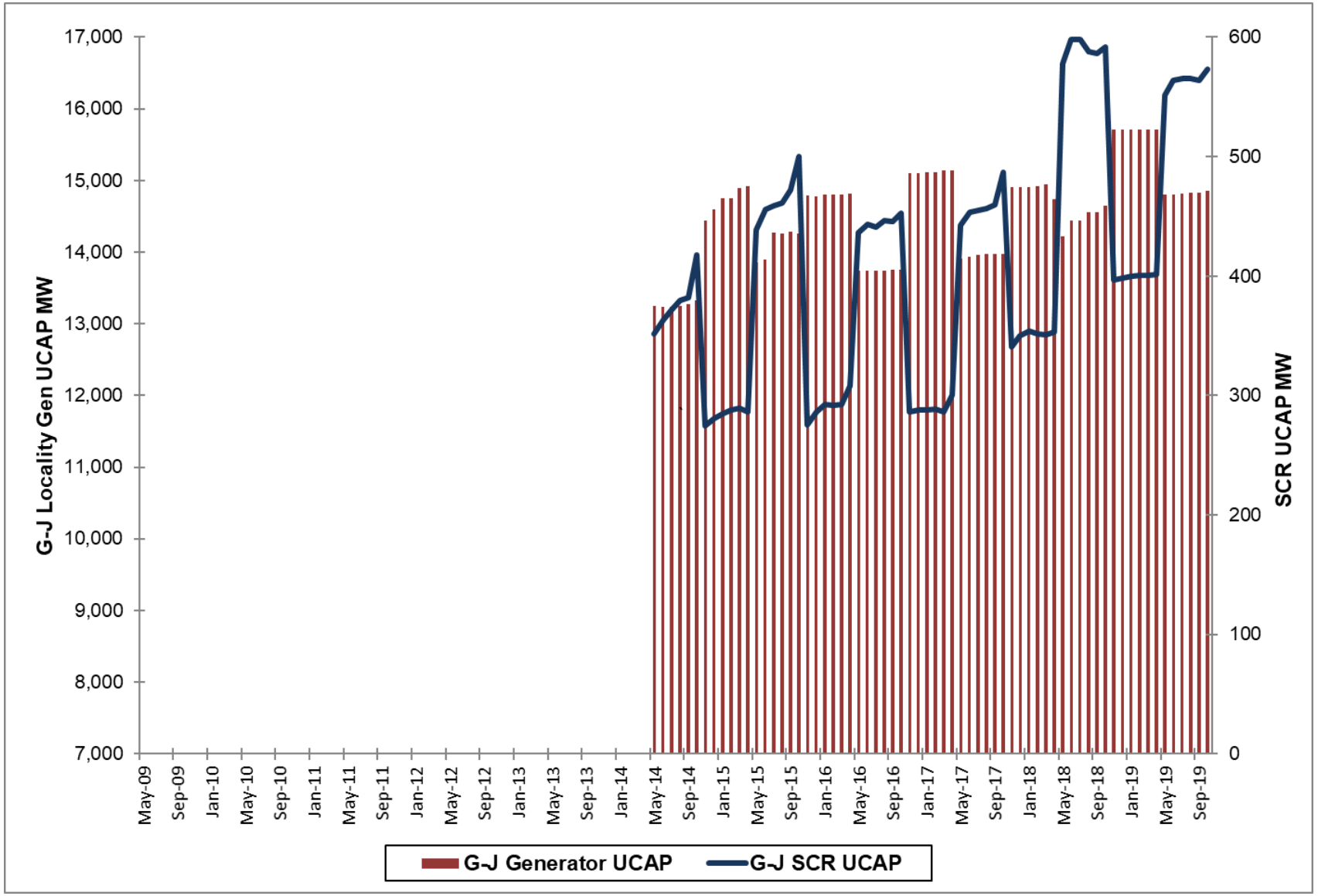


Chart 6: G-J Locality Generator and SCR UCAP



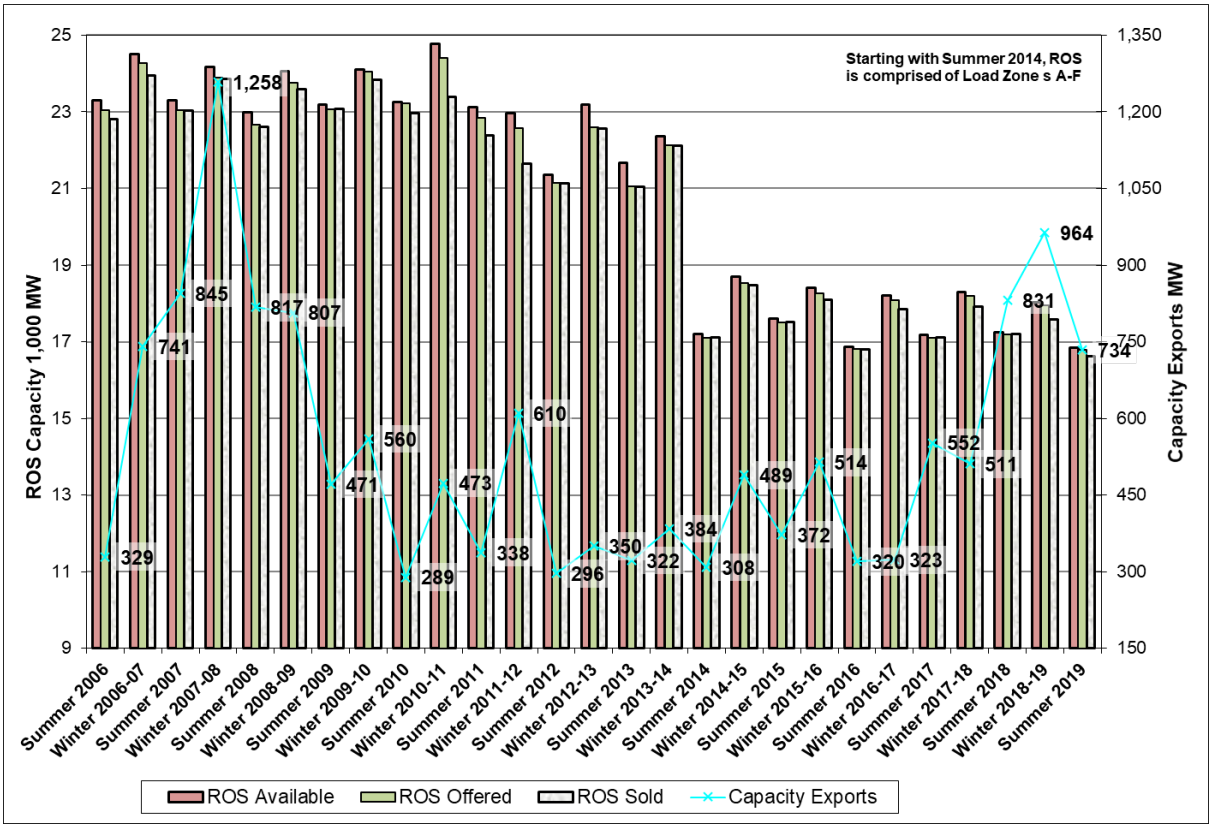
4. Rest of State

4.1 Overview

This section of the report addresses possible withholding of Capacity located in the Rest of State[9] from November 2018 through October 2019. For this review, the NYISO conducted a detailed analysis of unoffered and unsold capacity. This section of the report pertains primarily to the NYCA but also contains some explanations for unoffered capacity in NYC, the G-J Locality, and Long Island.

Chart 7 shows the monthly average values over each Capability Period for four ROS capacity types: available, offered, sold, and exported MW.

Chart 7: Rest of State Capacity: Available, Offered, Sold, Exported



Examination of Rest of State capacity data pertaining to individual Market Participants revealed general patterns in unsold and unoffered capacity. The patterns suggest a three-way classification of suppliers by market sector: all generation-owning transmission owners, ROS generation owners, and other suppliers (a category which includes SCRs.) Table 3 of this Report summarizes the monthly averages of unoffered and unsold capacity for each Capability Period since Summer 2008.

[9] Prior to the Summer 2014 Capability Period, ROS consisted of transmission zones A through I; starting May 2014, ROS is defined as transmission zones A through F.

Table 3: ROS Unoffered and Offered but Unsold Capacity MW by Type of MP

ROS Monthly Average Unoffered Capacity MW by Type of MP							
	GenCo	% of GenCo	Other	% Other	TO	% TO	Capability Period Monthly Average
Summer 2008	114.2	32.74%	30.3	8.69%	204.4	58.57%	348.9
Summer 2009	49.2	41.06%	1.4	1.18%	69.3	57.76%	119.9
Summer 2010	98.1	37.13%	7.9	2.98%	158.2	59.90%	264.2
Summer 2011	54.1	25.80%	76.7	36.56%	79.0	37.64%	209.8
Summer 2012	60.1	29.48%	75.3	36.96%	68.4	33.56%	203.8
Summer 2013	486.6	78.28%	64.2	10.33%	70.8	11.39%	621.5
Summer 2014	58.9	62.03%	24.2	25.52%	11.8	12.45%	95.0
Summer 2015	21.3	26.97%	30.7	38.98%	26.9	34.05%	78.9
Summer 2016	6.6	10.78%	15.9	25.96%	38.8	63.26%	61.4
Summer 2017	45.2	59.75%	18.4	24.39%	12.0	15.86%	75.6
Summer 2018	21.0	42.54%	15.5	31.33%	12.9	26.13%	49.4
Summer 2019	34.7	61.51%	15.0	26.57%	6.7	11.91%	56.4

ROS Monthly Average Unoffered Capacity MW by Type of MP							
	GenCo	% of GenCo	Other	% Other	TO	% TO	Capability Period Monthly Average
Winter 2008-2009	236.8	78.54%	0.6	0.19%	64.1	21.27%	301.5
Winter 2009-2010	93.3	48.14%	9.5	4.88%	91.0	46.98%	193.7
Winter 2010-2011	212.6	57.39%	30.4	8.19%	127.5	34.41%	370.4
Winter 2011-2012	138.5	36.98%	93.7	25.00%	142.4	38.02%	374.6
Winter 2012-2013	437.3	73.43%	21.0	3.52%	137.3	23.05%	595.5
Winter 2013-2014	118.2	50.12%	54.1	22.94%	63.6	26.94%	235.9
Winter 2014-2015	70.6	41.63%	47.0	27.72%	52.0	30.65%	169.6
Winter 2015-2016	84.9	59.47%	6.8	4.78%	51.0	35.76%	142.7
Winter 2016-2017	38.2	32.70%	32.5	27.86%	46.1	39.45%	116.7
Winter 2017-2018	66.2	62.27%	11.6	10.91%	28.5	26.83%	106.4
Winter 2018-2019	16.8	21.67%	36.6	47.26%	24.1	31.07%	77.5

ROS Monthly Average Offered but Unsold Capacity MW by Type of MP							
	GenCo	% of GenCo	Other	% Other	TO	% TO	Capability Period Monthly Average
Summer 2008	61.6	99.49%	0.3	0.51%	0.0	0.00%	61.9
Summer 2009	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Summer 2010	15.4	35.56%	27.8	64.44%	0.0	0.00%	43.2
Summer 2011	479.9	91.01%	44.9	8.52%	2.5	0.47%	527.3
Summer 2012	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Summer 2013	11.6	100.00%	0.0	0.00%	0.0	0.00%	11.6
Summer 2014	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Summer 2015	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Summer 2016	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Summer 2017	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Summer 2018	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Summer 2019	174.3	100.00%	0.0	0.00%	0.0	0.00%	174.3

ROS Monthly Average Offered but Unsold Capacity MW by Type of MP							
	GenCo	**% of GenCo**	**Other**	**% Other**	**TO**	**% TO**	**Capability Period Monthly Average**
Winter 2008-2009	178.7	97.65%	4.3	2.35%	0.0	0.00%	183.0
Winter 2009-2010	73.4	95.30%	3.6	4.70%	0.0	0.00%	77.0
Winter 2010-2011	895.6	89.53%	104.7	10.47%	0.0	0.00%	1000.3
Winter 2011-2012	811.3	86.49%	88.4	9.43%	38.4	4.09%	938.0
Winter 2012-2013	8.3	60.98%	5.3	39.02%	0.0	0.00%	13.7
Winter 2013-2014	0.0	0.00%	7.0	100.00%	0.0	0.00%	7.0
Winter 2014-2015	5.0	7.79%	59.0	92.21%	0.0	0.00%	64.0
Winter 2015-2016	127.5	67.86%	17.6	9.38%	42.8	22.76%	187.9
Winter 2016-2017	203.2	87.79%	28.3	12.21%	0.0	0.00%	231.4
Winter 2017-2018	205.8	86.24%	32.8	13.76%	0.0	0.00%	238.7
Winter 2018-2019	253.4	79.39%	64.9	20.34%	0.9	0.27%	319.2

Salient facts from the previous tables are:

- The group of all ROS generation-owning Transmission Owners had unoffered capacity which ranged from 11% to 64% of total unoffered capacity.
- The group of all ROS generation-owning Transmission Owners had up to 23% of offered and unsold capacity.
- The group of generation owners consistently had unoffered capacity which ranged from 11% to 79% of total unoffered capacity.
- The group of generation owners had unsold capacity which accounted for 0% to 100% of total capacity that was offered and unsold capacity.
- The group of all others including SCRs had unoffered capacity that ranged from 0% to 47% of total unoffered capacity.
- The group of all others including SCRs had capacity that was offered and unsold capacity that ranged from 0% to 100%.

4.2 Analysis of ROS Unoffered Capacity

This section provides a detailed analysis of the unoffered capacity located in the ROS. The section also presents the maximum price impact of the unoffered capacity, in each month and averaged over the six months of each Capability Period. Market Participants with a significant amount of unoffered capacity were provided an opportunity to justify their unoffered MW. Generally, responses suggest that the Installed Capacity Suppliers' reasons for not offering the Capacity were benign, and none of the instances evidenced behavior intended to artificially raise prices.

Instances of unoffered capacity in Mitigated Capacity Zones are potentially subject to a non-discretionary penalty assessment (Services Tariff Section 23.4.5.4.2), and are not included in this section.

The NYISO contacted each Installed Capacity Supplier with at least 15 MW of unoffered capacity in any one month during the period November 2018 through October 2019 for an explanation of why it did not offer all of its capacity. There were seven Market Participants in nine instances with 15 MW or more of

unoffered capacity in any given month in ROS, and the NYISO sought and received explanations from each of them.

Five Market Participants in six instances reported that their failure to offer capacity into the ICAP market was due to an administrative oversight. Two Market Participants stated that they missed the bidding or certification window. Two Market Participants stated that they made a mistake in submitting the offers. One Market Participant (in two instances) stated that it incorrectly assumed that any excess capacity it possessed would be automatically sold in the spot auction.

One Market Participant reported environmental and/or physical conditions as cause for not offering capacity. The responses detailed causes including conservative operating strategies.

Two Market Participants reported that it was a bidding strategy not to offer their capacity. One of the Market Participants (a SCR) mentioned the reason for not offering its capacity is because of the shutdown of plant operations due to economic conditions.

Table 4 shows the maximum price impact of the unoffered capacity based on the slopes of the ICAP Demand Curves for the relevant Capability Periods. The maximum price impact is calculated as the lesser of (1) the product of the monthly unoffered MW and the slope of the ICAP Demand Curve and (2) the ICAP Spot Market Auction Market-Clearing Price, since the price impact cannot exceed the auction price. Monthly values and seasonal averages of the maximum price impact are reported. The maximum price impact of the unoffered capacity, averaged over the six months of the Winter 2018-2019 and Summer 2019 Capability Periods, was $0.16/kW-month (ranging from $0.07/kW-month to $0.29/kW-month) and $0.15/kW-month (ranging from $0.08/kW-month to $0.31/kW-month), respectively.

Table 4: Maximum Price Impact of ROS Unoffered Capacity[10]

Month	Total Unoffered MW	Monthly Maximum Price Impact	Seasonal Average Maximum Price Impact
Nov-18	43.3	$0.10	$0.16
Dec-18	84.9	$0.10	
Jan-19	97.1	$0.13	
Feb-19	115.3	$0.29	
Mar-19	26.0	$0.07	
Apr-19	98.1	$0.25	
May-19	30.1	$0.08	$0.15
Jun-19	39.1	$0.10	
Jul-19	50.5	$0.13	
Aug-19	118.1	$0.31	
Sep-19	54.3	$0.14	
Oct-19	46.2	$0.12	

[10] The price impact of ROS unoffered capacity average $0.21/kW-month for the Winter 2017-2018 (ranging from $0.15/kW-month to $0.25/kW-month), and $0.13/kW-month for the Summer 2018 (ranging from $0.05/kW-month to $0.22/kW-month). The monthly price impact cannot exceed the ICAP Spot Market Auction clearing price for that month.

4.3 Analysis of ROS Unsold Capacity

This section analyzes and reports on ROS unsold capacity in the ICAP Spot Market Auction. This year, the NYISO utilized a new methodology in ROS unsold analysis[11]. The NYISO reports the following three items:

1) Monthly maximum price impacts of offered but unsold UCAP ("unsold UCAP") for each Locality and for the NYCA.

2) Amount of unsold UCAP offered at prices above unit-specific annual going forward costs (as described below, "annual GFCs").

3) Price impact estimates of unsold UCAP for the Analysis Year from Units (Generators, capacity using Unforced Capacity Deliverability Rights ("UDR projects"), Special Case Resources, and other capacity Resources) that are shown to have recovered, or could have recovered, their annual revenue requirement (based on annual GFCs).

For the purpose of this report, the GFCs are defined as costs that could be reasonably expected to be avoided if the plant was mothballed for at least one year less projected net revenues from energy and ancillary services markets. These GFCs may provide insight into why a generator offered its capacity at a non-zero offer price. In this analysis, GFCs are calculated for the entire capacity of the plant.

In order to report the second and third item listed above, Market Participants with 15 MW of unsold UCAP in any period in which a threshold is met will be required to provide GFC Data.

Thresholds:

- The Capability Period price impact threshold: This threshold will be met for the Capability Period if the average Market-Clearing Price of the NYCA in that Capability Period is $1.00/kW-mo. or greater, and the average maximum price impact of unsold UCAP for that Capability Period, calculated under the assumption that monthly GFCs for unsold UCAP are zero, is $0.20/kW-mo. or greater.

- The monthly price impact threshold: This threshold will be met for a given month if the Market-Clearing Price for the NYCA in that month is $1.00/kW-mo. or greater, and the maximum price impact of unsold UCAP, calculated under the assumption that monthly GFCs for unsold UCAP are zero, is $0.35/kW-mo. or greater.

Market Participants required to provide Annual GFC data:

- If the Capability Period price impact threshold is met for a given Capability Period, the NYISO will request and Market Participants will be required to provide data needed to calculate unit specific annual GFCs from any Unit with more than an average of 15 or more unsold MW over that Capability Period.

- If the Capability Period price impact threshold is not met for a given Capability Period, but the monthly price impact threshold is met for one or more months within that Capability Period, the NYISO will request and Market Participants will be required to provide data needed to calculate

[11] See NYISO's May 17th, 2019 filing with FERC under Docket Nos. ER01-3001-000 and ER03-647-000.

unit-specific annual GFCs from any Unit with more than 15 or more unsold MW for those months in which the monthly price impact threshold is exceeded.

4.3.1 Monthly Maximum Price Impacts

All the unsold MW in NYC are subsequently sold in G-J, with an exception of resources subject to offer floors in the Winter 2018-2019 Capability Period. Therefore, there is no price impacts associated with NYC unsold MW.

There is no unsold MW in G-J Locality other than the NYC resources subject to offer floors in the Winter 2018-2019 Capability Period.

Table 5 includes the average monthly maximum price impact of unsold capacity in Long Island for each Capability Period. Because of the limited amount of unsold MW in Long Island, the price impact is minimum. Note that the unsold MW in February and March 2019 were subsequently sold in NYCA, therefore there is no price impact.

Table 5: Maximum Price Impact of LI Unsold MW

Month	Total Unsold MW	Monthly Maximum Price Impact	Seasonal Average Maximum Price Impact
Nov-18	0	$0.00	$0.01
Dec-18	0	$0.00	
Jan-19	0.1	$0.00	
Feb-19	2.7	$0.00	
Mar-19	0.1	$0.00	
Apr-19	3.1	$0.05	
May-19	0	$0.00	$0.00
Jun-19	0	$0.00	
Jul-19	0	$0.00	
Aug-19	0	$0.00	
Sep-19	0	$0.00	
Oct-19	0	$0.00	

Table 6 includes the average monthly maximum price impact of unsold capacity for each Capability Period. The average price impacts were $0.35/kW-month in Winter 2018-2019 and $0.44/kW-month in the Summer 2019. The Capability Period impact threshold of $0.20/kW-month was exceeded in both Winter 2018-2019 and Summer 2019. Additionally, the monthly maximum price impact exceeds the $0.35/kW-month threshold for six months (February, March, May, July, September and October of 2019).

Table 6: Maximum Price Impact of ROS Unsold MW

Month	Total Unsold MW	Monthly Maximum Price Impact	Seasonal Average Maximum Price Impact
Nov-18	511.3	$0.10	$0.35
Dec-18	173.0	$0.10	
Jan-19	58.9	$0.13	
Feb-19	176.3	$0.44	
Mar-19	481.3	$1.09	
Apr-19	514.4	$0.26	
May-19	200.8	$0.52	$0.44
Jun-19	0.0	$0.00	
Jul-19	234.1	$0.61	
Aug-19	98.0	$0.25	
Sep-19	201.6	$0.52	
Oct-19	311.0	$0.75	

4.3.2 Amount of Unsold UCAP Offered at Prices Above Unit-Specific Annual GFC

Table 7 below shows the amount of unsold capacity by the analysis months that triggered the threshold mentioned above, for which calculated GFCs were exceeding the ICAP Spot Auction Price. There are two generators associated with 15 MW or more of unsold capacity from ROS.

Table 7: ROS Unsold MW with reported GFCs costs above ICAP Spot Auction Prices (15MW+)

Month	Total Unsold MW (15+)	ICAP Spot Auction Price	Total Unsold with GFCs above ICAP Monthly Auction Price (15MW+)
Mar-19	480.0	$1.09	480.0
May-19	200.8	$1.14	200.8
Jul-19	234.1	$1.39	234.1
Aug-19	98.0	$1.36	98.0
Sep-19	201.6	$1.35	201.6
Oct-19	311.0	$0.75	311.0

4.3.3 Price impact estimates of unsold UCAP from Units that are shown to have recovered, or could have recovered, their annual revenue requirement (based on annual GFCs).

The NYISO analyzed the price impact using annual GFCs as follows for the Analysis Year:

1. For the Unit with the lowest annual GFC value (expressed in $/kW-mo.), the NYISO will conduct a simulation of the ICAP Spot Market Auctions for the entire Analysis Year. The simulation will replace all actual ICAP Spot Market Auction offers from the Unit with a $0/kW-month Offer, and

will determine the resulting simulated clearing prices for each simulated spot market auction. The NYISO will then determine if the Unit would have recovered its annual GFCs in the simulated spot market auctions. This determination will be made by comparing its annual revenue requirement (based on the Unit's UCAP and annual GFC values) to its simulated spot market auction sales in the twelve Spot Market Auctions for that Analysis Year.

a. Any Unit that is shown to NOT recover its annual GFCs through the simulation will not be considered in the price impact calculations below.

b. Any Unit that is shown to recover its annual GFCs through the simulation will have its simulated Offers remain in the simulated Spot Auction for the remaining Units.

2. Step 1 will be performed sequentially for each Unit from which the NYISO requested annual GFCs, in ascending order by the next lowest annual GFC.

3. The price impact will be reported as the difference between the actual ICAP Spot Market Auction clearing price, and the clearing price of the simulated spot market auction after all Units have been simulated at their $0/kW-month offers.

Following the procedures described above, Table 8 shows the price impact. The NYISO find that the units with unsold MW would not have recovered their annual GFCs if they were to offer as price takers. Therefore, the price impact of unsold UCAP for the Analysis Year from Units that are shown to have recovered, or could have recovered, their annual revenue requirement is zero.

Table 8: ROS Unsold MW Price Impact Analysis

Month	ICAP Spot Auction Price	Simulated ICAP Spot Price	Price Impact
Mar-19	$1.09	$1.09	$0.00
May-19	$1.14	$1.14	$0.00
Jul-19	$1.39	$1.39	$0.00
Aug-19	$1.36	$1.36	$0.00
Sep-19	$1.35	$1.35	$0.00
Oct-19	$0.75	$0.75	$0.00

The results of the simulations shown in Table 8 indicate that the NYCA ICAP Spot Market Auction prices likely would not have been lower if the entire offers that did not clear had been offered at their respective GFC values. The associated potential zero price impacts do not indicate that economic withholding occurred over Winter 2018-2019 and Summer 2019.