
**BUYER SIDE MITIGATION
ICAP FORECAST – CLASS YEAR 2019 NYC
ADDITIONAL SDU STUDY
ASSUMPTIONS & REFERENCES**

NEW YORK INDEPENDENT SYSTEM OPERATOR

**MARKET MITIGATION
AND ANALYSIS**

ISSUED: June 7, 2021

1. Introduction

This document describes assumptions and identifies the sources of the inputs into the BSM ICAP Forecast¹ for the buyer-side market power mitigation (“BSM”) rule² determinations for Examined Facilities requested in the Class Year 2019 Additional System Deliverability Studies that are located in Mitigated Capacity Zones — New York City (“NYC” or “Zone J”).³ It is accompanied by an Excel workbook containing specific values and selected calculations;⁴ the Class Year 2019 NYC Additional SDU Studies Renewable Exemption Limit Assumptions and Calculations⁵, and the “BSM Narrative and Numerical Example,” which provides general information regarding the methodology for the BSM exemption tests, the ICAP forecast, and Offer Floor shaping.⁶

2. Demand Curve Parameters

The ICAP Demand Curves used in the BSM ICAP Forecast are calculated using the parameters outlined in this section. For each parameter, the source is identified and in certain instances, discussed.

2.1. Load Forecast

The Load forecast for the three years comprising the Mitigation Study Period (“MSP”) is taken from the most recently-published NYISO Load & Capacity Data Report (“Gold Book”).⁷ The Load forecast values are taken from Table I-3a “Baseline Summer Coincident Peak Demand, Historical & Forecast,” Table I-4a “Baseline Summer Non-Coincident Peak Demand, Historical & Forecast,” and Table I-5 “Baseline Peak Demand in G-to-J Locality, Historical & Forecast.”

¹ Terms with initial capitalization not defined herein have the meaning set forth in the NYISO’s Market Administration and Control Area Services Tariff (“Services Tariff”), and if not defined in the Services Tariff, have the meaning set forth in the NYISO’s Open Access Transmission Tariff.

² References herein in to BSM and BSM Rules means the rules set forth Services Tariff Section 23.4.5.7, *et seq.*

³ See Services Tariff §23.4.5.15, “Forecasts Under the Buyer Side Market Power Mitigation Measures”.

⁴ The Excel Workbook for Class Year 2019 NYC Additional SDU Study is available at: <https://www.nyiso.com/market-monitoring> → Buyer Side Mitigation → Class Year 2019 → ICAP Buyer-side Mitigation Test Data ASDU June 7 2021: <https://www.nyiso.com/documents/20142/8363446/ICAP-Buyer-side-Mitigation-Test-Data-ASDU-2021-June-7-2021.xlsx/b383736d-0bd5-79a5-8c0e-a87ae77c9c41>

⁵ The Renewable Exemption Limit Assumptions and Calculations for this Additional System Deliverability Study is available at: <https://www.nyiso.com/documents/20142/8363446/CY2019-NYC-ASDU-Study-Renewable-Limit-Update.pdf/44b31e69-4fb7-60e3-3402-6c844ab5c057>

⁶ The BSM Narrative and Numerical Example is available at: <https://www.nyiso.com/documents/20142/3026079/BSM-Narrative-and-Numerical-Example-Updated-November-09-2020.pdf>

⁷ The Gold Book 2021 is available at: <https://www.nyiso.com/documents/20142/2226333/2021-Gold-Book-Final-Public.pdf>

2.2. New York Control Area Minimum and Locational Minimum Installed Capacity Requirements

The NYISO developed a forecast of Locational Minimum Installed Capacity Requirements (“LCRs”) values for the MSP as part of the Class Year 2019 NYC Additional SDU Studies BSM ICAP Forecast. Similarly, the New York Control Area (“NYCA”) Minimum Installed Capacity Requirement (“IRM”) is forecasted for the MSP.

The forecast of the LCRs to be used in the BSM ICAP Forecast is motivated and made possible in large part by the LCR-setting methodology contained in the filed tariff revisions.⁸ These tariff provisions, provide a detailed framework and process to establish the LCRs under an optimized LCR method. Using provisions contained therein, and hypothetical conditions including those contemplated by the BSM Forecasts, the NYISO projected LCRs for the Class Year 2019 NYC Additional SDU MSP. However, technical limitations prevented use of the TAN 45 methodology, which resulted in a fully optimized IRM and LCRs.

The projected IRM and LCR values used in the BSM ICAP Forecast, shown in Table 1, were developed using the Alternative LCR Methodology and reflect projected system conditions and topology that are based on the assumptions and inputs developed for the BSM Forecasts (i.e. Forecasted Peak Load, CY 2019 NYC Additional SDU Facilities).

This forecast was run on the approved 2021 LCR case (i.e., modeling assumptions used to set 2021-2022 Capability Year LCRs). This case was updated to include the forecast assumptions as noted above.

The 2023-2024 Capability Year LCRs were left unchanged. While the previous results in the 2019 Class Year indicated downward pressure in Zone J as a result of the deactivation of several units, those results did not include topology changes (series reactors in-service and other LPT upgrades) which are expected to have upward pressure on Zone J LCRs. Consistent with the CY 2019 forecast⁹, the NYISO imposed 6% reduction to capacity requirements in zones G-J in the 2024/25 capability year to account for the topology changes expected from the Public Policy AC Transmission upgrades.

Table 1: Forecasted LCRs and IRMs

Capability Year	Zone J	G-J Locality	NYCA
2022/23	86.0%	92.0%	126.1%
2023/24	86.0%	92.0%	126.1%
2024/25	86.0%	86.0%	126.1%

⁸ See *New York Independent Sys. Operator*, Docket No. ER18-1743-000, <https://nyisoviewer.etariff.biz/viewerdoclibrary/Filing/Filing1416/Attachments/Att%20I%20NYISO%20Rspns%20to%20Alt%20LCR%20Dfncy%20Ltr.pdf>.

⁹ See ICAP Buyer-side Mitigation Test Data Assumptions Document Class Year 2019 January 14 2021 <https://www.nyiso.com/documents/20142/8363446/ICAP-Buyer-Side-Mitigation-Test-Data-Assumptions-Documents-Class-Year-2019-January-14-2021.pdf/d3906db2-35c4-2e69-7452-5a5537becce4>

For any units that were tested separately under the Part B test because their Net CONE was lower than the Default CONE, the optimized LCRs and IRMs were adjusted to account for the expected changes from the reduced supply stack.

2.3. ICAP Demand Curve Zero Crossing Points

The ICAP Demand Curve zero crossing point for each Locality is set forth in Services Tariff Section 5.14.1.2.¹⁰ For Class Year 2019 NYC Additional SDU, the zero crossing points are 112% for the NYCA, 115% for the G-J Locality, and 118% for New York City.

2.4. ICAP Demand Curve Reference Points

The ICAP Demand Curve reference points for the NYCA and the Localities are set forth in the Services Tariff.¹¹ A summary of the currently effective Demand Curve parameters for 2021-2022 can be found on the NYISO website.¹² While the NYISO tariff requires that it prepare and file a Demand Curve Reset in November 2020, the ICAP Demand Curve reference points used in the Class Year 2019 NYC Additional SDU Studies are projected for each year of the MSP in a manner consistent with the Demand Curve annual update rules.¹³

2.4.1. Escalating the Peaking Plant Gross Cost

The NYISO escalated the effective ICAP Demand Curve peaking plant gross cost using the “inflation index¹⁴”, consistent with the average of the most recently published median Headline Consumer Price Index (CPI) and Headline Personal Consumption Expenditures (PCE) long-term annual averages for inflation over the ten years that includes the last year of the Mitigation Study Period, as reported by the Survey of Professional Forecasters. For Class Year 2019 NYC Additional SDU, the inflation index value is 2.20%.

2.4.2. Estimating the Peaking Plant Net Energy & Ancillary Services Revenues

For each year of the MSP, the NYISO estimated the net Energy and Ancillary Services (“EAS”) revenues using a rolling, “period-correct,” three-year sample of inputs. For example, Capability Year 2022/2023 (*i.e.*, year 1 of MSP) used inputs for the period from September 2018 through August 2021 to estimate peaking plant net EAS revenues. Capability Year 2023/2024 would roll off September 2018 through August 2019 and add in September 2021 through August 2022. For future dates where historic data were not available, the NYISO used (1) fuel prices, which were developed based on forward curves, and (2) forecasted LBMPs, developed using the econometric model, to estimate net EAS

¹⁰ See Services Tariff Section 5.14.1.2 table.

¹¹ *Id.*

¹² 2021-2022 Demand Curve Parameters and Demand Curves, <https://www.nyiso.com/documents/20142/20942735/ICAP-Demand-Curve-Parameters-04132021.pdf/>

¹³ The annual update rules for the ICAP Demand Curves are set forth in Section 5.14.1.2.2 of the Services Tariff.

¹⁴ See MST 23.4.57.4.

revenues for Examined Facilities. This is discussed further in the BSM Narrative and Numerical Example. The rolling three-year samples of inputs were used in the same dispatch model to estimate the net EAS of the peaking plant of the currently effective ICAP Demand Curves.

Table 2: Projected peaking plant net Energy and Ancillary Services revenues used to identify the ICAP Demand Curves for the BSM ICAP Forecast, represented in \$/kW-Year

Capability Year	Zone J	G-J Locality	NYCA
2022/2023	32.77	32.70	24.52
2023/2024	39.67	38.64	25.06
2024/2025	51.32	56.29	27.94

2.4.3. Estimating Winter-to-Summer Ratio

The NYISO updated the winter-to-summer ratio (“WSR”) for each year of the MSP based on the Summer and Winter Capability Period ICAP during each year of the MSP. The available ICAP used to calculate the WSR is a function of the capacity resources identified with inclusion and exclusions rules described in section 3 below.

Table 3: Forecasted Winter-to-Summer Ratios used to identify the ICAP Demand Curves for the BSM ICAP Forecast¹⁵

Capability Year	Zone J	G-J Locality	NYCA
2022/2023	1.076	1.060	1.035
2023/2024	1.073	1.061	1.031
2024/2025	1.075	1.063	1.033

2.5. Installed Capacity/Unforced Capacity Translation Factor

The Installed Capacity/Unforced Capacity (“ICAP/UCAP”) translation factor for each Capability Period is calculated based on values that correspond most closely with the seasonal Dependable Maximum Net Capability values in the most recently published Gold Book. The 2021 Gold Book is the most recently published Gold Book. ICAP/UCAP translation factors projected for each year of the MSP are provided in Table 4.

Table 4: Forecasted ICAP/UCAP Translation Factors used to identify the ICAP Demand Curves for the BSM ICAP Forecast

	Summer 2022	Summer 2023	Summer 2024	Winter 2022/23	Winter 2023/24	Winter 2024/25
Zone J	8.41%	8.19%	8.19%	5.81%	4.93%	4.93%
G-J Locality	7.70%	7.51%	7.51%	5.19%	4.93%	4.93%
NYCA	14.17%	14.81%	14.81%	13.08%	13.83%	13.83%

¹⁵ These values have been updated to align with the summer ozone period consistent with the compliance plans filed in response to the DEC Peaker Rule. This adjustment accounts for generation capacity in the month of October in applicable capability years for units which indicated operation during this month per their compliance plans submitted in response to the DEC Peaker Rule.

2.6. Demand Curve Calculated Values

The calculations utilized to determine the UCAP reference point, UCAP requirement, UCAP at \$0, and Demand Curve slope are described in the BSM Narrative and Numerical Example.

3. Supply Curve

3.1. “Price taking” UCAP (*i.e.*, UCAP that offers at \$0.00/kW-mo)

3.1.1. Generation Capacity – “Existing Units”

Generators and Unforced Capacity Delivery Rights (“UDR”) projects identified in the ISO’s most-recently published Gold Book that have Capacity Resource Interconnection Service (“CRIS”) and are operating at the time that the ISO determines the BSM ICAP Forecast; including but not limited to Generators in Forced Outage or Inactive Reserve status, are identified as “Existing Units” and are included in the forecast.¹⁶

3.1.2. UCAP Associated with Special Case Resources

The capacity associated with Special Case Resources (“SCRs”) is based on SCR enrollment in each ICAP Spot Market Auction during the three Capability Years preceding the 2021 Gold Book (*i.e.*, Capability Years 2018/2019, 2019/2020, and 2020/2021). SCR UCAP from the “Monthly SCR Reports” posted on the ICAP section of the NYISO public website were averaged by Capability Period and by each Locality and the NYCA.¹⁷

3.1.3. Unoffered and Unsold Capacity

“Unoffered” and “Unsold” UCAP is based on the “Unoffered” and “Unsold” UCAP megawatts in each ICAP Spot Market Auction during the three Capability Years preceding the 2021 Gold Book (*i.e.*, Capability Years 2018/2019, 2019/2020, and 2020/2021). “Unoffered” and “Unsold” UCAP from the “Monthly UCAP Reports” posted on the ICAP section of the NYISO public website were averaged by Capability Period and by each Locality and the NYCA.¹⁸ “Unoffered” and “Unsold” UCAP is removed from the supply stack of each Locality and the NYCA.

¹⁶ See Services Tariff Section 23.4.5.7.15.4, “Existing Units.”

¹⁷ See <https://www.nyiso.com/installed-capacity-market>, under the “Monthly Reports → Monthly SCR Reports.

¹⁸ *Id.*

3.1.4. Cleared UCAP

Cleared UCAP is offered into the ICAP Spot Market Auctions as a price-taker. Cleared UCAP is the MW of UCAP that had been subject to an Offer Floor and that have cleared in any 12, not necessarily consecutive, ICAP Spot Market Auctions.¹⁹

3.1.5. Examined Facilities from Prior Class Years

The UCAP MW of Examined Facilities that remained in prior Class Years at the time of the completion of that Class Year (“Prior Class Year Facilities”) and that do not meet the Generation Capacity criteria in section 3.1.1 above are assumed to be price-takers in the supply stack if the Prior Class Year Facility (a) was on the “Active” tab of the most recently published version of the NYISO Interconnection Queue, (b) was determined to be exempt from Offer Floor mitigation, and (c) approximately, has incurred or expended, in the aggregate, more than 5 percent of its cost of new entry for the following: engineering, procurement, and construction costs; financing costs; or interconnection costs invoiced by the interconnecting Transmission Owner(s), *e.g.*, Transmission Owner attachment facilities, System Deliverability Upgrades, and System Upgrade Facilities; net of any amounts that would likely be recouped if the project was not completed (*e.g.*, a deposit that would be returned) (“5 percent threshold”) and has made progress meeting its regulatory milestones indicating it could enter service. For determinations for Class Year 2019 NYC Additional SDU Examined Facilities, six Prior Class Year Examined Facilities did not meet these criteria. Prior Class Year Examined Facilities that did not meet these criteria are considered in the price responsive category, as described in section 3.2.5 below.

3.2. Price responsive UCAP

3.2.1. Additional Units & Excluded Units

In some circumstances, and subject to certain exceptions, a Generator or UDR project that is not already included in the ICAP Forecast as an Existing Unit may be included as an Additional Unit.^{20, 21} Broadly put, this occurs if either: (a) there are positive indicators that the unit will repair and return to service, or (b) the Net Present Value of returning the unit to service is positive. Given that Confidential Information was utilized in the development of the BSM ICAP Forecast, or could be derived from data information associated with the Net Present Value analysis, the units studied are identified, but not the determinations for inclusion in the BSM ICAP Forecast.^{22, 23}

¹⁹ Existing UCAP that is subject to an Offer Floor is excluded from this category, and is described in section 3.2.3 below.

²⁰ See Services Tariff Section 23.45.7.15.5, “Additional Units.”

²¹ See Services Tariff Section 23.4.5.7.15.7, “Exceptions.”

²² Services Tariff Section 23.4.5.7.15.1 provides that a “positive indicator” that a Generator or UDR project will repair and return to service includes indications that a return to service is, in the ISO’s judgment, likely and imminent, such as visible site activity, executed labor or fuel supply arrangements, or unit testing.”

²³ See Services Tariff Section 23.4.5.7.15.8, “Net Present Value Analysis.”

3.2.1.1. Publicly Available Information

Generators and UDR projects for which there is publically available information demonstrating with reasonable certainty that they will indefinitely cease operation shall be identified as excluded capacity.²⁴

For Class Year 2019 NYC Additional SDU Study, the NYISO excluded a number of resources, as listed in the 2021 Gold Book, based on public information about each unit’s proposed compliance plans in response to the DEC peaker rule.²⁵ A subset of these units that will permanently cease operation have been identified as Incremental Regulatory Retirements in Table 4 of the Class Year 2019 Renewable Exemption Limit Assumptions and Calculations.

3.2.2. Unforced Capacity Delivery Rights that have already entered the market

UCAP sales associated with UDRs of existing UDR facilities were forecasted using a two-step process. First, historical monthly UCAP sales from UDR facilities during the three Capability Years preceding the 2021 Gold Book (*i.e.*, Capability Years 2018/2019, 2019/2020, and 2020/2021) were determined and then Capability Period and Locality averages were calculated. Second, UDR facilities were assumed to only import UCAP if the relevant market price spread would compensate the UDR rights holder(s) for the cost of obtaining capacity in the neighboring Control Area.

For the Class Year 2019 NYC Additional SDU forecast, UDR UCAP sales into New York City were reduced until capacity prices at the UDR source and sink points converged or UDR sales reached zero. UDR UCAP sales into Long Island were not adjusted.²⁶

3.2.3. Net of Imports into and Exports from the NYCA

First-come, first-served imports and exports over AC transmission were forecasted using a two-step process. First, historical import and export UCAP sales over AC transmission during the three Capability Years preceding the 2021 Gold Book (*i.e.*, Capability Years 2018/2019, 2019/2020, and 2020/2021) were determined. Second, the price-responsiveness of these imports and exports was reviewed, where applicable. That is, did import and export UCAP vary as a function of the difference in capacity market prices between the NYISO and the neighboring Control Area? For Class Year 2019 NYC Additional SDU Study, the NYISO found that imports from Hydro Quebec and PJM were not price-responsive and that imports from ISO New England were price responsive. UCAP imports and exports from ISO New England were adjusted based on the difference between ISO New England Forward Capacity Auction capacity prices and the BSM ICAP Forecast prices. The NYISO determined that Hydro Quebec is likely to have sufficient capacity

²⁴ See Services Tariff Section 23.4.5.7.15.7.2, “Exceptions”.

²⁵ The Gold Book 2021 is available at: <https://www.nyiso.com/documents/20142/2226333/2021-Gold-Book-Final-Public.pdf>

²⁶ This methodology was also used for the preceding Class Year BSM determinations. See Potomac Economics’ “Assessment of the Buyer-Side Mitigation Exemption Tests for the Class Year 2017 Projects” (July, 2019) p 39-40 of the report. <https://www.nyiso.com/documents/20142/3025517/MMU-Report-CY17--BSM-Evaluation-July-2019.pdf>

margins to simultaneously continue its historical export patterns. Therefore, historic capacity imports from Hydro Quebec to the NYCA were not adjusted. Lastly, the NYISO applied the import rights limits²⁷ for each Control Area.

Existing UCAP that is subject to an Offer Floor is added to the price-responsive category of the supply stack.

This UCAP is included in the BSM ICAP Forecast price at its applicable Offer Floor, inflated to the MSP. The NYISO adjusted the Offer Floor of Mitigated UCAP to account for inflation as described in Section 4 of the BSM Narrative and Numerical Example.

3.2.4. Prior Class Year Examined Facilities not under the Section 3.1.5 Criteria

The UCAP of Prior Class Year Examined Facilities that have not yet entered the market are included in the price-responsive category of the supply stack if it (a) is on the “Active” tab of the most recently published version of the NYISO Interconnection Queue, (b) received an Offer Floor in its Class Year, and (c) the NYISO determined it is has satisfied at least one of the following: (i) satisfied the 5 percent threshold or (ii) would earn sufficient capacity revenue to recoup its Unit Net CONE, considering its Offer Floor, in a capacity price forecast for a three-year period starting one year before the Class Year 2019 NYC Additional SDU MSP, and which does not include the current Class Year Examined Facilities and has made progress meeting its regulatory milestones indicating it could enter service.²⁸

Facilities that met all three criteria are included in the Class Year 2019 NYC Additional SDU ICAP Forecast supply stack at the applicable Offer Floor, inflated to the Class Year 2019 NYC Additional SDU MSP.

3.2.5. Examined Facilities in Class Year 2019 NYC Additional SDU Study

Examined Facilities are assumed to offer into the appropriate Locality(ies) and the NYCA from lowest to highest, ordering each Examined Facility by the lower of the first year value of its Unit Net CONE or the numerical value equal to 75% of the Mitigation net CONE. In Class Year 2019 the NYISO introduced the Renewable Exemption for intermittent resources. Any resources receiving a Renewable Exemption (in part or full) was modeled into the appropriate Locality(ies) and the NYCA as a price taker (\$0.00/kW-mo) for the portion of their facility receiving a Renewable Exemption.

For the Class Year 2019 NYC Additional SDU determination, the NYISO included the Examined Facilities listed in Table 6 below in the price-responsive category of the supply stack.

²⁷ External ICAP Rights for the 2020/2021 Capability Year presentation:

https://www.nyiso.com/documents/20142/10754502/4%20BIC_2020_02_12%20import-rights.pdf

²⁸ Updated since original posting on November 11, 2020 to more clearly illustrate the threshold for the potential market entry of a facility.

Table 6: CY2019 NYC Additional SDU Examined Facilities

QUEUE POS.	PROJECT	ZONE
737	El Sunset Park	J

Each Examined Facility was required to submit expected net degraded summer and winter capacity values as part of the BSM evaluation. The NYISO sought to validate the submission and, if not validated, the NYISO substituted alternate appropriate net degraded summer and winter capacity values. Such values were utilized in the BSM evaluation, including in the BSM ICAP Forecast.

3.2.6. Class Year Projects and Prior Class Year Projects Located Outside the Mitigated Capacity Zones

For the UCAP of Class Year Projects and Prior Class Year Projects located outside the Mitigated Capacity Zones (MCZs), all projects are included. This includes the Prior Class Year Projects that are seeking Additional CRIS (*e.g.*, an uprate), or that have Energy Resource Interconnection Service (“ERIS”) and are only seeking CRIS. These projects are all assumed to be price-takers (\$0.00/kW-mo).

4. Auction Resolution for a Locality Contained Within Another Locality

ICAP Spot Market Auction clearing prices for the Part B test were forecasted by sequentially offering the Examined Facilities from lowest to highest, ordered by the lower of the first year value of each Examined Facility’s Unit Net CONE or the numerical value equal to 75% of the Mitigation Net CONE. For each iteration, the resulting three year average ICAP Spot Market Auction price was compared with the three-year average Unit Net CONE (“UNC”) of the Examined Facility. If the three year average ICAP Spot Market Auction clearing price exceeded the UNC of the Examined Facility, then:

- the Examined Facility received a Part B exemption, and
- the Examined Facility offered into all subsequent iterations of the ICAP Spot Market Auction forecast (*i.e.*, for all Examined Facilities with higher values of the lower of the first year value of their Unit Net CONE or the numerical value equal to 75% of the Mitigation Net CONE) at \$0/kW-mo.

If the forecasted three year average ICAP Spot Market Auction clearing price is less than or equal to the UNC of the Examined Facility, then:

- the Examined Facility did not receive a Part B exemption, and
- is excluded from all subsequent iterations of the ICAP Spot Market Auction Forecast.

This iterative process continued until all Examined Facilities were tested. ICAP Spot Market Auction clearing prices for the Part A test are determined using the same iterative method. The BSM Narrative and Numerical Example provide an illustrative example of both processes. For all ICAP Spot Market Auction forecasts, a minimum market clearing price of \$1.00/kW-mo in each Locality and the NYCA is assumed. When UCAP does not clear in the smallest Mitigated Capacity Zone that contains the Load Zone in which the Examined Facility is electrically located (*i.e.*, NYC), the UCAP is “reoffered” into the auction of the other Locality in which it is located (*i.e.*, the G-J Locality), and the NYCA.

Finally, the ICAP Spot Market Auction clearing price for a Locality is the maximum of that Locality's ICAP Spot Market Auction clearing price and the ICAP Spot Market Auction clearing prices of all Localities in which it is located, and the NYCA.