BUYER SIDE MITIGATION
ICAP FORECAST – CLASS YEAR 2015
ASSUMPTIONS & REFERENCES

NEW YORK INDEPENDENT SYSTEM OPERATOR

MARKET MITIGATION
AND ANALYSIS

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1. Introduction

This document describes assumptions and identifies the sources of the inputs into the ICAP Forecast for the buyer-side mitigation ("BSM") determinations for Examined Facilities[1] located in the New York City ("NYC") and the G-J Localities. It is accompanied by a spreadsheet containing specific values and selected calculations; 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.[2]

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 ("Gold Book"), *i.e.*, *2016 Load & Capacity Data*[3] *Table* I-2a "Baseline Forecast of Annual Energy & Coincident Peak Demand" sub-table "Forecast of Coincident Summer Peak Demand by Zone – MW", Table I-2b-1 "Baseline Forecast of Zonal Non-Coincident Peak Demand" sub-table "Forecast of Zonal Non-Coincident Summer Peak Demand by Zone – MW" and Table I-2b-2 "Baseline Forecast of Non-Coincident Peak Demand – G to J Locality" sub-table "Forecast of G-to-J Locality, Summer Peak – MW".

2.2. NYCA Minimum and Locational Minimum Installed Capacity Requirements (LCR)

NYCA Minimum Installed Capacity Requirement and LCR values for the Class Year 2015 BSM determinations are based on the current values: the 2016/2017 Capability Year. The G-J Locality LCR and NYC LCR were adjusted from 90.0% to 94.0% and from 80.5% to 79.5%,

[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] Available at:
<http://www.nyiso.com/public/webdocs/markets_operations/services/market_monitoring/ICAP_Market_Mitigation/Buyer_Side_Mitigation/Numerical_Example/BSM_Narrative_and_Numerical_Example%20March%207%202014.pdf>.

[3] Available at:
<http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2016_Load__Capacity_Data_Report.pdf>.
<http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2016_Load__Capacity_Data_Report.pdf>.

respectively. These adjustments are in recognition of historically observed changes to the G-J Locality and NYC LCRs when capacity entered into service within Load Zone G, H, or I. These values remain constant in each year of the Mitigation Study Period. The current NYCA Minimum Installed Capacity Requirement and the Zone K (Long Island) LCR were used without adjustment.

2.3. ICAP Demand Curve Zero Crossing Points

The ICAP Demand Curve zero crossing point ("ZCP") for each Locality is set forth in Services Tariff Section 5.14.1.2.[4] For Class Year 2015, the Zero-Crossing Points are 112% for the NYCA, 115% for the G-J Locality, and 118% for New York City ("NYC").

2.4. ICAP Demand Curve Reference Points

The ICAP Demand Curve reference points for the NYCA, NYC, G-J Locality, and Long Island ("LI") ICAP Demand Curves are set forth in the Services Tariff.[5] A Summary of the Demand Curve parameters for NYCA, NYC, G-J Locality and LI can be found on the NYISO website.[6] ICAP Demand Curves were escalated to each year of the Mitigation Study Period using the 2.2% escalation rate from the NYISO's "2014-2017 Demand Curve Parameters and Demand Curves" posting.[7]

2.5. ICAP/UCAP Translation Factor

The ICAP/UCAP translation Factor for each Capability Period is the ICAP/UCAP translation factor published on the NYISO public website that corresponds most closely with the seasonal DMNC values in the most recently published Gold Book.[8]

The 2016 Gold Book is the most recently published Gold Book. Therefore, the Summer 2015 and Winter 2015/16 ICAP/UCAP Translation Factors are used in the ICAP Forecast.

2.6. Demand Curve Calculated Values

[4] *See* Services Tariff Section 5.14.1.2 at table.

[5] *Id.*

[6] See 2014-2017 Demand Curve Parameters and Demand Curves, available at: <http://www.nyiso.com/public/webdocs/markets_operations/market_data/icap/Reference_Documents/2014-2017%20Demand%20Curve%20Reset/Demand_Curve_Reset/2014-2017%20Demand%20Curve%20Parameters%20and%20Demand%20Curves.pdf>.

[7] *Id.*

[8] For example, see: <http://www.nyiso.com/public/webdocs/markets_operations/market_data/icap/ICAP_Auctions/2016/Summer_2016/Documents/ICAP%20Translation%20of%20Demand%20Curve%20_Summer%202016.pdf>.

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. Existing Generation Capacity

The ICAP MW of available generation capacity is that set forth in the most recently published Gold Book Table III-2.[9] Summer ICAP is the minimum of the resource's Summer DMNC and its CRIS. Winter ICAP is the resource's Winter DMNC, except for Winter-CRIS limited resources.[10] The ICAP/UCAP translation factors, as described in Section 2.5, for each Locality were used to convert these values, by location, to UCAP.

3.1.2. Capacity of deactivated units

The 2016 Gold Book Tables IV-3, IV-4, and IV-5 (cumulatively "Generation Deactivations Tables") and the "Generator Status Update" spreadsheet from the NYISO public website show deactivated capacity and capacity that proposes to deactivate within the NYCA.[11] Units that have submitted a "Notice of Intent to Retire" to the New York Public Service Commission are excluded from the ICAP forecast. Units that have not submitted such notice are included in the ICAP forecast. The ICAP/UCAP translation factors, as described in Section 2.5, for each Locality were used to convert these values, by location, to UCAP.

3.1.3. UCAP Associated with Special Case Resources

The capacity associated with Special Case Resources ("SCRs") is based on the data underlying Tables V-2a and V-2b, ("NYCA Load and Capacity Schedule – Summer"/ "NYCA Load and Capacity Schedule – Winter") in the most recently published Gold Book. The data in the Gold Book is presented for the NYCA as a whole. The ICAP Forecast utilizes the data in zonal form. The ICAP/UCAP translation factors, as described in Section 2.5, for each Locality were used to convert these values, by location, to UCAP.

3.1.4. Unoffered and Unsold Capacity

[9] *See* 2016 Gold Book Table III-2

[10] NYISO OATT Attachment S Section 25.7.6 specifies how the NYISO calculates Winter CRIS. "The CRIS value for the Winter Capability Period will be set at a value that will maintain the same proportion of CRIS to ERIS as the facility has for the Summer Capability Period." The NYISO appropriately reflects this limit in the ICAP Forecast.

[11] *See*: <http://www.nyiso.com/public/markets_operations/services/planning/documents/index.jsp>, under "Generator Status Update – 11-09-2016".

"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 2016 Gold Book (*i.e.*, Capability Years 2013/2014, 2014/2015, and 2015/2016). "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.[12] "Unoffered" and "Unsold" UCAP is removed from the supply stack of each Locality and the NYCA.

3.1.5. Cleared UCAP

Existing UCAP that is subject to an Offer Floor is excluded from the price-taking category (*i.e.*, $0.00 offer) of the supply stack. These UCAP MW, which are subject to an Offer Floor, are assumed offer into the ICAP Spot Market Auctions at their Offer Floor, inflated to the appropriate year of the Mitigation Study Period, as described in Section 3.2.3.

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

3.1.6. 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 have not yet entered the market 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, and (b) was determined to be exempt from Offer Floor mitigation. For determinations for Class Year 2015 Examined Facilities, only the CPV Valley Energy Center (Queue #251, Class Year 2011) met these criteria. Prior Class Year Examined Facilities that did not meet these criteria are considered in the price responsive category, as described in Section 3.2.4.

3.2.Price responsive UCAP

3.2.1. Unforced Capacity Delivery Rights ("UDRs) that have already entered the market

UCAP sales from Unforced Capacity Deliverability Rights (UDRs) were forecasted using a two step process. First, historical monthly UCAP sales from UDR projects during the three Capability Years preceding the 2016 Gold Book (*i.e.*, Capability Years 2013/14, 2014/15, and 2015/16) were determined and then Capability Period and Locality averages were calculated.

[12] *See*: <http://www.nyiso.com/public/markets_operations/market_data/icap/index.jsp>, under the "Monthly Reports > Monthly UCAP Reports".

Second, UDR projects were assumed to only import UCAP if the relevant market price spread would compensate the UDR rightsholder(s) for the cost of obtaining capacity in the neighboring market.

For the Class Year 2015 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.[13]

3.2.2. Net of Imports into and Exports from the NYCA

First-come, first serve 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 2016 Gold Book (*i.e.*, Capability Year 2013/2014, 2014/2015, and 2015/2016) were determined.

Second, the price-responsiveness of these imports and exports was reviewed. 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 2015, the NYISO found that imports from Hydro Quebec and PJM were not price-responsive and that imports from ISO New England were price responsive.

Therefore, 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 Spot Market Auction price forecast prices.

In doing so, the NYISO also confirmed that forecasted imports and exports remain at reasonable levels. Specifically, forecasted monthly imports were not allowed to exceed the maximum observed monthly import value the three Capability Years of data that was used to develop the initial import and export values (*i.e.*, Capability Years 2013/2014, 2014/2015, and 2015/2016). Forecasted monthly exports were not allowed to exceed the average Capacity Supply Obligation that NYCA resources obtained during ISO New England's Forward Capacity Auction #9 and Forward Capacity Auction #10.

Additionally, given the potential for the Champlain Hudson Power Express to substantially increase capacity imports from Hydro Quebec to the NYCA, the capacity margins of Hydro Quebec were evaluated. Reductions in capacity margins (*i.e.*, load growth, resource retirements, and increased exports from Hydro Quebec) were compared with growth in capacity margins (*i.e.*, resource additions) during the Mitigation Study Period.[14] The NYISO determined that

[13] Potomac Economics' "Assessment of the Buyer-Side Mitigation Exemption Tests for the Class Year 2012 Projects" (January 13, 2015) discusses this point. *See*, e.g., <http://www.nyiso.com/public/webdocs/markets_operations/services/market_monitoring/ICAP_Market_Mitigation/Buyer_Side_Mitigation/Class%20Year%202012/MMU%20Report%20on%20CY%202012%20BSM%20Tests.pdf>.

[14] *See*: <http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2015LTRA%20-%20Final%20Report.pdf> and <http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.pdf>.

Hydro Quebec is likely to have sufficient capacity margins to simultaneously continue its historical exports patterns and support additional exports. Therefore, historic capacity imports from Hydro Quebec to the NYCA were not adjusted.

3.2.3. Existing UCAP That is Subject to an Offer Floor

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 ICAP Spot Market Auction price forecast at its applicable Offer Floor, inflated to the Mitigation Study Period. 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 3.1.6 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 the NYISO determined it is has satisfied at least one of the following: (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") or (d) 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 2015 Mitigation Study Period, and which does not include the current Class Year Examined Facilities.

Facilities that met all three criteria are included in the Class Year 2015 ICAP Forecast supply stack at the applicable Offer Floor, inflated to the Class Year 2015 Mitigation Study Period.

3.2.5. Examined Facilities in Class Year 2015

Examined Facilities located within a Mitigated Capacity Zone 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.

For Class Year 2015, the NYISO includes the following Examined Facilities in the price-responsive category of the supply stack:

- Astoria Energy CC1 and CC2, New York City
- Bowline 2, G-J Locality
- Champlain Hudson Power Express (Queue #305), New York City
- East River 1, New York City
- East River 2, New York City
- Linden Cogeneration Plant, New York City

Examined Facilities are required to submit expected net degraded summer and winter capacity values as part of the BSM evaluation. The NYISO validated the submission or, if not validated, it substituted alternate appropriate net degraded summer and winter capacity values. It utilizes such values throughout the BSM evaluation, including in the ICAP Forecast

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 Class Year 2015 Examined Facilities from lowest to highest, ordered by the lower of the first year value of each Examined Facilities 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 exceeds the UNC of the Examined Facility, then:

- the Examined Facility receives a Part B exemption
- 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 three year average ICAP Spot Market Auction price is less than or equal to the UNC of the Examined Facility, then:

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

This iterative process continues until all Examined Facilities are 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 provides 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 such the Examined Facility was 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.