New York ISO
Independent System Operator

M-06

Load Forecasting Manual

Issued: ~~November 2020~~Month Year

WG/SUBCOMMITTEE DRAFT – NOT FOR COMMITTEE ACTION~~DISCUSSION PURPOSES ONLY~~

New York ISO

Version: 4.~~32~~

Effective Date: ~~11/30/2020~~MM/DD/YYYY

Committee Acceptance: ~~11/11/2020~~MM/DD/YYYY BIC

Prepared by: NYISO System & Resource Planning

New York Independent System Operator
10 Krey Blvd
Rensselaer, NY 12144
(518) 356-6000
www.nyiso.com

Disclaimer: The information contained within this manual, along with the other NYISO manuals, is intended to be used for informational purposes and is subject to change. The NYISO is not responsible for the user's reliance on these publications or for any erroneous or misleading material.

New York ISO

Table of Contents

Revision History

Version	Date	Revisions
1.0	09/23/1999	Initial Release
2.0	05/14/2001	Unavailable
3.0	08/09/2006	Complete rewrite of manual
4.0	04/30/2010	Global ➢ Completely revised content. ➢ Updated tariff citations to reflect section renumbering secondary to e-Tariff implementation. ➢ Reformatted per new template to standardize presentation. ➢ Implemented minor stylistic changes. ➢ Revision History Table: changed column headings as follows: • "Revision" changed to "Version." • "Changes" changed to "Revisions."
4.0.1	09/11/2013	Recertification
4.1	04/02/2020	Global ➢ Added text to account for BTM:NG Resources. ➢ Updated text on release of LFTF Schedule ➢ Clarified rule for treatment of TO Demand Response impacts ➢ Added a subsection to describe the difference in forecasts used for the ICAP Market and the forecast used for Locational Capacity Markets
4.1	07/23/2020	Recertification Ministerial ➢ Hyperlinks and cross references updated ➢ Branding and formatting updated
4.2	11/11/2020	Global ➢ Added text to update clarify the selection criteria for the NYCA peak day ➢ Updated and clarified the RLGF criteria to reflect the updates discussed with LFTF and changes put forth in NYISO Technical Bulletin #251 (TB-251)
4.3	MM/DD/YYYY	Global ➢ Updates for the B628 project (DER Aggregator Market Participation) project ➢ Transmission Owner and Aggregator data submission requirements to support bulk power system load forecasting with DER ~~a~~Aggregations ➢ NYISO data posting requirements for Aggregations ➢ ICAP forecasting method updates for Aggregation impacts on Peak Load forecasting requirements

Formatted: Font: (Default) Franklin Gothic Book, 10 pt

Formatted: Font: (Default) Franklin Gothic Book, 10 pt

Formatted: Font: (Default) Franklin Gothic Book, 10 pt

Formatted: Table BL, Indent: Left: 0.1", Hanging: 0.19"

1. Overview

The NYISO's Business Issues Committee (BIC) is responsible for the establishment of procedures related to the efficient and non-discriminatory operation of electricity markets centrally coordinated by the NYISO, including procedures related to bidding and settlements and the calculation of market prices. (BIC By-Laws, 9.01.1.)

The Load Forecasting Task Force (LFTF) has been designated by the Installed Capacity Working Group of the BIC to prepare and present load forecasts used in the Installed Capacity markets for the New York Control Area (NYCA) and for those Transmission Districts with a Locational Minimum Installed Capacity Requirement. The LFTF's methods and procedures for preparing load forecasts are described in this Load Forecasting Manual. The LFTF does not prepare the Installed Reserve Margin (IRM), the Equivalent Demand Forced Outage Rates for Generators, or the percentages of the Locational Minimum Installed Capacity Requirements.

1.1 Purpose and Scope

This manual has ~~two~~three~~wo~~ main purposes.

The first purpose is to set forth the data reporting, weather-normalization methodology, and load forecasting methodology requirements that are prescribed in the *NYISO Market Administration and Control Area Services Tariff* (*Services Tariff*) Sections 5.10 and 5.11 and used in the calculation of the NYCA Installed Capacity ("ICAP") forecast. The load forecasts used in the calculation of the NYISO's Installed Capacity requirements will be referred to herein as *ICAP Market Load Forecasts*.

The second purpose is to set forth the data submissions required by the NYISO to prepare the ICAP Market Load Forecasts and its filings to NPCC, NERC, FERC, and other reliability and regulatory bodies.

The third purpose is to set forth the data submissions required by the NYISO to forecast (a) the load modifying impacts of Behind-the-Meter generation resources, ~~(b) Large Load Facilities[1] subject to reporting requirements of as described in Appendix A~~ and (cb) market participating Distributed Energy Resources ("DERs").

~~[1] Large Load Facilities: Pursuant to the NYISO's Transmission Expansion and Interconnection Manual, the NYISO Load interconnection procedures apply to Load interconnections that are either: a) greater than 10 MW connecting at a voltage level of 115 kV or above, or b) 80 MW or more connecting at a voltage level below 115 kV.~~

1.2 ICAP Forecast for the New York Control Area and ICAP Forecast for Localities

Prior to each Capability Year, the NYISO determines the forecast peak load for the NYCA (as referred to in *NYISO Services Tariff* Section 5.11.1, "NYCA peak Load") and for each Locality. The NYCA forecasted peak load for each Capability Year is based on the highest Adjusted Actual Load for the NYCA during non-holiday weekday hours occurring in July or August in the immediately preceding Capability Year. The NYCA Adjusted Actual Load is calculated by adjusting the coincident peak for the entire Control Area. The forecasted peak load for each Locality is based on the highest Adjusted Actual Load in each Locality, calculated using the Locality's non-coincident peak load. That is, each Locality's actual peak load may be non-coincident with the NYCA actual peak load.

Adjusted Actual Load is defined in *NYISO Services Tariff* Section 2.1. That definition sets forth adjustments to Actual Load.

When computing the Adjusted Actual Load for the NYCA or a Locality, the load reductions include those resulting from dispatchable load management programs of Load Serving Entities (LSEs), Curtailment Service Providers (CSPs), ~~or~~ Responsible Interface Providers (RIPs~~)~~, or Aggregations that are not otherwise accounted for by the Transmission Owners (TOs) and Municipal Electric Systems (MES) through the components of their respective Adjusted Actual Load computations.

The ICAP Market Load Forecast for the NYCA is computed by; (1) taking the product of (a) the Adjusted Actual Load of each Transmission District or MES that is coincident with the NYCA peak, and (b) one plus the Regional Load Growth Factor (1 + RLGF) applicable to each Transmission District or MES, and (2) summing these individual Transmission District or MES peak forecasts.

The ICAP Market Load Forecast for each Locality is similarly obtained by (1) taking the product of (a) the non-coincident Adjusted Actual Load in the Locality of each Transmission District or MES, and (b) one plus the Regional Load Growth Factor (1 + RLGF) applicable to each Transmission District or MES in the Locality, and (2) summing these individual Transmission District or MES Locality peak forecasts.

Commented [A1]: VR: where are DADRP and DSASP programs accounted for in here? TOs and MESs?

Commented [A2R1]: That information is accounted for by the NYISO metering

Commented [A3]: VR:
How are Demand Reduction caused by DERs participating in Aggregations be accounted for?
Add "Demand reduction caused by Distributed Energy Resources participating in Aggregations"?

Commented [A4R3]: CA: Included DER aggregations.

Commented [A5R3]: All types or just DER Aggregations?

Commented [A6R3]: All types, this is clarified in section 2

2. Data, Weather-Normalization, and Load Forecasting Methodology Submission Requirements for the NYCA ICAP Market Load Forecast

This section describes the following:

1. Notification procedures to be followed by the NYISO
2. Data submission requirements for TOs and MES~~e~~s, LSEs, CSPs, RIPs, BTM:NG Resources, and Aggregators.
3. The procedures the NYISO follows for:
   - Evaluating the TO and MES submitted actual and weather-normalized loads at the time of the NYCA peak hour (and Locality peaks)
   - Calculating NYCA Weather-Normalized Load + Losses (WNL+L) at the NYCA peak hour for the Capability Year during which the calculation is being performed
   - Accounting for the impacts of Behind-the-Meter Net Generation (BTM:NG) Resources
   - Calculating a Weather Normalization Factor (WNF) for each individual BTM:NG Resource
   - Calculating the Transmission District Weather Normalization Factor (TDWNF)
   - Evaluating TO and MES Regional Load Growth Factors (RLGFs)
   - Calculating the forecasted NYCA ICAP peak and each TO, MES and BTM:NG Resource load at the same one hour on the same date as the forecasted NYCA peak.
   - Calculating the Locality peak forecast of all TO, MES and BTM:NG Resource loads located in each of the Localities at their peak dates and times.

2.1 Notification Procedures to be Followed by the NYISO

The *Capability Year Peak* for purposes of this section of the *Load Forecasting Manual* is defined to be the highest hourly load during non-holiday weekdays in July or August during a Capability Year. The peak information and data will be posted by September 1 consistent with the Schedule below.

Information and data provided to members of the LFTF will include:

1. **ICAP Market Load Forecast Schedule:** Each year, the NYISO will release a Schedule by September 1 that will list the dates by which data and analyses are to be completed and submitted to the NYISO;

2. **Capability Year Peak and Date and Hour of Occurrence:** The NYISO will provide these data points to the TOs and MESos by September 1;

~~2.~~3. **EDRP, (DADRP, DSASP) ~~and~~ SCR, and Aggregation Demand Reduction Performance during the NYCA Peak Hour:** The NYISO will provide these data points by October ~~30~~31~~0~~30;

4. **BTM:NG Resource Load Data**: The NYISO will provide the Peak Proxy Load data points by October ~~30;~~31~~0~~;

~~3.~~5. **Retail Load Modifying Generating Resource Load Data**: The NYISO will provide the peak load data points by October 31 for the purposes of calculating the top generating hours coincident with the top NYCA peak loads of transitioning retail load modifying generators seeking to participate in an Aggregation in the ICAP Market;

~~4.~~6. **Evaluation of TO and MES Weather-Normalized Loads:** The NYISO will provide these data points in November;

~~5.~~7. **Evaluation of TO and MES RLGFs:** The NYISO will provide these data points in December;

~~6.~~8. **Preliminary ICAP Market Load Forecast:** The NYISO will provide these data points in December; and

~~7.~~9. **Final ICAP Market Load Forecast:** The NYISO will provide these data points, including the ACHL for BTM:NG Resources in December.

2.2 Data Submission Requirements for (TOs, MESs, LSEs, CSPs, RIPs, ~~and~~ BTM:NG Resources, and Aggregators)

TOs and MESs shall submit to the NYISO:

1. Hourly loads for each quarter-year (first quarter is January – March, *etc.*) within 90 days after the quarter's end;

2. Actual load during the hour and on the date of the NYCA peak, and including a statement of whether or not transmission losses are included;

~~2.~~3. The weather-normalized load during the hour and on the date of the NYCA peak, in accordance with Section 2.2.4;

~~3.~~4. The previous five years' values for Subsections 2.2.2 and 2.2.4 of this manual;

~~4.~~5. The MW impact of Emergency Operating Procedures (EOPs) and load modifiers operating during the hour and on the date of the NYCA peak;

Commented [A7]: VR: After transition period, remove language related to DADRP and DSASP programs.

Commented [A8R7]: Added mention of DER Aggregation Demand Reduction

Commented [A9]: CA: Proposal: Injecting DERs transitioning from BTM and seeking CRIS rights will need this load data in order to provide their peak our performance so that their load modifying impacts can be accounted for in the ICAP load forecast.

Commented [A10]: VR: Add Aggregators? Discuss with DRO and ICAP groups

Commented [A11R10]: CA: Added Aggregators – Need data for DER moving from BTM and into the ICAP market.

~~5.~~6. The actual and weather-normalized Locality non-coincident peak load for each TO and MES with Locational Minimum Unforced Capacity Requirements; and

~~6.~~7. Regional Load Growth Factors.

LSEs, CSPs, and RIPs shall submit to the NYISO and to the TO providing transmission service to the respective loads, the load reduction resulting from the LSE's, CSP's, or RIP's own dispatchable load management programs that were in effect during the hour and on the date of the NYCA peak and during the hour and on the date of the Locality peak.

~~(The due dates for items required by Subsections 2.2.2 through~~ 2.2.11 ~~of this manual will be set forth in the Schedule).~~

Commented [A12]: VR: Confirm Deletion?

(BTM:NG Resources and Aggregations are subject to particular eligibility rules and qualifications, and special reporting requirements, as described in ICAP Manual ~~Section~~Sections 4.15 and 4.1. BTM:NG Resources having Generators that are expected to be unavailable for the next capability year, or that do not enter the market for the first time (*i.e.*, "new" resources) by August 1 of the current Capability Year, may be excluded from the forecasts described in this manual.) Facilities that are operating as a retail load modifier and that elect to participate in an Aggregation, and DER that elect to exit an Aggregation to be a retail load modifier must make their elections by August 1 of the current Capability Year in order to be included in the forecasts described in this manual.

Commented [A13]: VR: Add similar rule for DER Aggregations?

Commented [A14R13]: CA: Yes. Added proposed language for review and discussion.

The due dates for items required by Subsections 2.2.2 through 2.2.10~~1~~ of this manual will be set forth in the Schedule.

2.2.1 Hourly Loads

TO and MES hourly loads are necessary for verification of the load at the time of the NYCA peak and for other purposes as described in Section 2.3 of this manual. Data may be submitted in any electronic format acceptable to the NYISO.

2.2.2 Actual Load at the Time of the NYCA Peak

TOs and MES~~e~~s shall provide their load in MW during the hour and on the date of the NYCA peak for the current Capability Year together with a statement stating whether this load includes transmission losses.

2.2.3 Weather-Normalized Load at the Time of the NYCA Peak and Supporting Material

TOs and MESes shall provide the weather-normalized load corresponding to their actual load (provided pursuant to Section 2.2.2 of this manual). TOs and MESes may calculate their weather-normalized load using their own procedures. However, the design criteria employed by each TO and MES shall be such that it ensures, at a maximum, a 0.50 probability of occurrence on an annual basis. The design criterion (T Design) is sometimes referred to by specifying the number of years in which it is expected that the design criterion will be exceeded. A "1-in-2" criterion means that the actual peak day weather conditions are expected to exceed design once in every two years. A "1-in-3" criterion means that the actual peak day weather conditions are expected to exceed design once in every three years. The probability of occurrence for a "1-in-2" criterion is 50% while for a "1-in-3" criterion it is 33 1/3%. The probabilities of these criteria are 0.50 or less.

TOs and MESes shall provide the following supporting material:

1. A written description of the method used to derive the weather-normalized load from the actual load.
2. If a statistical model is used, the model, its statistics, and the data from which weather-normalized load was derived.
3. A description of and supporting data for the design conditions used in calculating the weather-normalized load.

2.2.4 Actual and Weather-Normalized Load at the Time of the NYCA Peak for the Five Preceding Years

TOs and MESes shall provide historical values of the actual and weather-normalized loads for each of the five Capability Years preceding each ICAP forecast. This data is used by the NYISO to evaluate Regional Load Growth Factors provided by TOs and MESes. If requested, the TOs and MESes shall provide supporting documentation. Results submitted by a TO or MES in respect of an ICAP forecast for a previous Capability Year need not be resubmitted unless the TO or MES has revised actual or weather-normalized data or resulting computation of its actual or weather-normalized load.

Commented [A15]: In practice, we rarely if ever receive and typically do not explicitly request historical WN loads. We use the final values from prior forecasts. Is it worth keeping this data requirement? I suppose it could be useful to point to in certain cases, but seems largely unneeded. I see that the final sentence in the paragraph makes this seem like an as needed request in the event of updates, so maybe this is fine as is.

Commented [A16R15]: CA: Good Point. The language is general enough to request prior WN loads if needed.

LEGAL/Dave – Please confirm.

2.2.5 MW Impact of EOPs and Load Modifiers Operating at, and MW Reductions from Programs Achieved During the Time of the NYCA Peak

TOs and MESes shall provide the MW reduction achieved by Emergency Operating Procedures (EOPs) and Load modifiers during the hour and on the date of the NYCA peak. TOs and MESes shall provide supporting documentation if requested by the NYISO.

LSEs, CSPs, and RIPs that activate resources in their own dispatchable load management programs during the hour and on the date of either the NYCA peak or a Locality peak shall report to the NYISO and the TO providing transmission service to the respective load, the MW reduction achieved by these resources at the time of each peak. LSEs, CSPs, and RIPS shall provide supporting documentation to the NYISO and the respective TO if requested.

TOs, MESs, LSEs, CSPs, ~~and~~ RIPs, and Aggregators shall compare the MW reduction from Demand Side Resources and their other respective dispatchable load management programs with those of the NYISO's SCR, DADRP, DSASP, and EDRP programs and from Aggregations to properly account for these impacts.

The NYISO shall verify data submitted by LSEs, CSPs, and RIPs, Aggregators on MW reductions achieved from programs that the NYISO uses in computing the NYCA Adjusted Actual Load. Each TO and MES shall verify the data submitted by LSEs, CSPs, and RIPs on MW reductions achieved from programs that the TO or MES uses in computing the Transmission District Adjusted Actual Load. Each TO and MES shall submit such verified data to the NYISO and any revisions or updates to the data. TOs and MESs shall provide supporting documentation if requested by the NYISO.

2.2.6 Behind-the-Meter Net Generation Resources

A BTM:NG Resource is defined in Section 2.2 of the NYISO's Market Services Tariff. BTM:NG Resources will provide actual hourly loads to the NYISO in accordance with the procedures defined in ICAP Manual Section 4.15. The NYISO will provide the following load data for BTM:NG Resources in accordance with Section 2.1 of this Manual:

1. The Peak Proxy Load, which is the average of the Resource's actual Host Load during its top 20 Load hours that occur during the highest 40 one-hour NYCA peak loads for the current Capability Year;
2. The ACHL that is applicable for the current Capability Year for each BTM:NG Resource, which is the Peak Proxy Load Value multiplied by 1+ WNF calculated for each BTM:NG Resource and 1+RLGF, pursuant to Services Tariff section 5.12.6.1.2.1;
3. The actual BTM:NG Resource Load, aggregated by Transmission District, at the date and hour of the NYCA peak; and
4. The actual BTM:NG Resource Load, aggregated by Transmission District, at the date and hour of each Locality peak.

Commented [A17]: VR: Add Aggregations comprised of Demand Side Resources only? Discuss with DRO

Commented [A18R17]: CA: All aggregators need to provide all Demand Response MWs for add back into the ICAP load forecast.

Commented [A19]: VR: After transition period, remove language related to DADRP and DSASP programs.

Commented [A20R19]: Do we wish to call that out? I surmise that would be best for a future manual update/recertification

Commented [A21]: VR: Confirm

Commented [A22]: New Section needed for Accounting for the Market Participating DER resources in the Actual Adjust Load Computation. Discuss with DRO

Commented [A23R22]: CA Added section 2.2.8 below

2.2.7 Facilities Transitioning from a Retail Load Modifier into an Aggregation in the ICAP Market

An Aggregation is defined in Section 2.4 of the NYISO's Market Services Tariff. Each facility that is transitioning (pursuant to the Aggregator elections, see Section 2.2) from a load modifying resource and into an Aggregation will provide actual generation values to the NYISO in accordance with the procedures defined in ICAP Manual Section 4.1.2. The Aggregator will provide the following data for facilities in accordance with Section 2.1 of this Manual:

1. Actual hourly generation values, aggregated by Transmission District, during its top 20 generating hours that occur during the highest 40 one-hour NYCA peak loads for the current Capability year;
2. The actual generation values of each transitioning facility, aggregated by Transmission District, at the date and hour of the NYCA peak; and
3. If located within a NYISO ICAP Market Locality, the actual generation values of each transitioning facility, aggregated by Transmission District, at the date and hour of each Locality peak.

Commented [A24]: As written, this only applies to heterogeneous aggregations. Is that the intent? Or all Aggregations?

Commented [A25R24]: The intent is all aggregations so that expected impacts to load levels can be forecasted.

Commented [A26]: Rules are in 4.1.10, definition is in 2.4

Commented [A27]: CA: Needs discussion with DRO

New term - Peak Proxy Generation?

Commented [A28]: Does generation in this sentence and elsewhere also imply and mean to include the impacts of DR, which would be analogous to the impact of generation?

Commented [A29R28]: No, DR is outlined separately

Commented [A30]: Need to add mention of the Enrollment process

Commented [A31R30]: Added reference to elections in paragraph above

Commented [A32]: Only if the aggregator is in a Locality, correct? Need to add a qualifier?

~~2.2.7~~2.2.8 Actual and Weather-Normalized Locality Peaks

Locality peaks may occur at a different time than the NYCA peak hour. If that is the case, each TO or MES that serves load in such Locality shall also provide the data required by Subsections 2.2.2 through 2.2.6 of this manual for the peak hour of each such Locality.

~~2.2.8~~2.2.9 Weather Normalization Factor

The NYISO will calculate a Weather Normalization Factor (WNF) for each BTM:NG Resource and for each Transmission District (TDWNF). If a WNF for a BTM:NG Resource cannot be calculated by the NYISO, the applicable TDWNF will be used in the calculation of ACHL described in section 2.2.6 above. The TDWNF will be calculated after determining the Adjusted Actual Load in a Transmission District. The TDWNF is calculated by subtracting Actual Load Less Losses (LLL) from the Adjusted Actual Load and dividing it by the Adjusted Actual Load. The NYISO will report this as (1 + TDWNF).

The (1 + WNF) for each BTM:NG Resource is determined as follows:

1. Find the average of the top twenty load hours for the BTM:NG Resource, selected from the top forty load hours of the NYCA: MW_Avg_Actual = Sum(top 20 loads) / 20. This is the Peak Proxy Load.

2. Calculate the difference between the temperature or heat index in the Transmission District at the time of the NYCA coincident peak and the design temperature or heat index for the Transmission District using the applicable T_Design for the Transmission District as discussed in section 2.2.3 of this manual: Delta_T = (T_Design – T_Actual)

3. For each of the top twenty load hours for the BTM: NG Resource, select the corresponding temperature or heat index for the Transmission District. Then find the slope of the regression line corresponding to these twenty ordered pairs of load for the BTM:NG Resource and temperature. This slope is referred to as Beta, in units of MW per degree. Beta must be greater than zero. If Beta is negative, then assign Beta a value of 0.

4. Calculate the weather adjustment Delta_MW for the BTM:NG Resource as the product of Delta_T and Beta: Delta_MW = Beta * Delta_T

5. The weather-adjusted load for the BTM:NG Resource is the sum of the MW_Avg load and the weather adjustment: MW_adj = MW_Avg_Actual + Delta_MW

6. Bulk power system losses for the BTM:NG loads are accounted for by multiplying the weather adjusted load by the factor (1 + TDWNF):

   MW_adj,TD = MW_adj * (1 + TDWNF)

7. The (1 + WNF) for each BTM:NG resource is the ratio of the MW_Adj,TD load from step 6 and the MW_Avg Actual load from step 1:

   (1 + WNF) = MW_Adj,TD / MW_Avg_Actual

~~2.2.9~~2.2.10 Regional Load Growth Factors ("RLGFs")

Each TO and MES shall provide RLGFs to the NYISO. An RLGF reflects the difference between its projected load during the hour and on the date of the NYCA peak for the next Capability Year and its Adjusted Actual Load during the hour and on the date of the NYCA peak in the current Capability Year as a fraction of the Adjusted Actual Load. RLGF shall be provided on the date set forth in the Schedule. The forecast for the next Capability Year is obtained by multiplying the Adjusted Actual Load in a Transmission District by (1 + RLGF) for that Transmission District.

2.3 Procedures for Determining the NYISO ICAP Market Load Forecast

This section describes procedures the NYISO will follow to produce the ICAP Market Load Forecast for each Capability Year. The following analyses will be performed:

1. Reconciliation of Transmission District loads at NYCA Peak;
2. ~~.~~ Calculation of TO and MES Load Less Losses (LLL);
2. Accounting for BTM:NG Resources;
3. Accounting for the impact of Aggregations;
3. ~~.~~4. Deduction of Station Power;
4. ~~.~~5. Evaluation of TO and MES Weather-normalized Load and Losses;
5. ~~.~~6. Allocation of Weather-normalized Losses to TOs and MES~~e~~s;
6. ~~.~~7. Evaluation of TO and MES RLGFs;
7. ~~.~~8. Forecast of TO and MES loads at time of predicted NYCA Peak; and
8. ~~.~~9. Forecast of Locality peaks.

2.3.1 Reconciliation of Transmission District Load at Time of NYCA Peak

TOs and MESs submit their above-described load data for the time and date of the NYCA peak in accordance with Subsection 2.2.2 of this manual. The NYISO will calculate Transmission District loads by adding TO and appropriate MES loads. The NYISO will compare the Transmission District peak loads reported by the TOs and MES~~e~~s to Transmission District billing loads with the NYISO Decision Support System (DSS). The NYISO will make adjustments necessary to account consistently for losses, Load modifiers, EOPs, SCRs, DADRP, EDRP, and DSASP reductions from dispatchable demand resource programs of LSEs, CSPs, and RIPs not otherwise accounted for.

The NYISO will also add back to the Transmission District loads the following data for Demand Side Resources participating in both the NYISO's EDRP, ~~and~~ SCR program and Aggregation participation program:

1. Load reductions resulting from activation of the SCR Program and EDRP during the Transmission District and NYCA peaks;
2. The output of any Local Generators that participate in NYISO's SCR Program operating during the date and time of the Transmission District and NYCA peaks when the NYISO has not activated its Demand Response programs; ~~and~~

Commented [A33]: VR: After transition period, remove language related to DADRP and DSASP programs.

Commented [A34]: SCR and EDRP will be evolving under the new DER Market participation model. We should add notes here about adding back load reduction from DR aggregations pursuant to and consistent with both FERC Order 2222 and FERC Order 745

Commented [A35R34]: VR: When are these programs going to be moved into DER model? We know that NYISO dispatchable load management programs will be replaced by DER Agg, not sure about the non-dispatchable ones.
Add how to account for load reduction due to DER Aggregations comprised of demand response.
Add back or already included in data coming from the TOs?

Commented [A36R34]:

Commented [A37R34]: CA:Added Demand Response MWs inside of DER programs.

3. Load reductions of EDRP resources and SCRs resulting from activation of Transmission Owner-administered retail demand response programs occurring during the Transmission District and NYCA peaks. Load reductions achieved by resources participating only in the Transmission Owner-administered demand response programs will not be added back; and.
4. Load reductions during the date and time of the Transmission District and NYCA peaks from Demand Side Resources that participate in an Aggregation. Load reductions achieved by Demand Side Resources participating only in the Transmission Owner-administered demand response programs will not be added back.

The NYISO will perform a reconciliation of Transmission District peak load prior to weather normalization as follows. If the Transmission District loads calculated from data submitted to the NYISO does not match the NYISO's calculations of Transmission District load, the NYISO will discuss and try to resolve the difference with the TO, MES, LSEs, CSPs, or RIPS, as appropriate. If the unresolved difference in Transmission District load is less than 1%, the NYISO will accept the Transmission District peak load reported by the TO or MES. If the unresolved difference exceeds 1%, the NYISO will determine the appropriate Transmission District load and submit it for comment to the Load Forecasting Task Force. In its discretion, the NYISO may also submit it for comment to the ICAP Working Group.

2.3.2 Calculation of TO and MES Load Less Losses (LLL)

Losses will be obtained from the NYISO DSS for each Transmission District. In cases where TOs reported their peak load inclusive of losses, the LLL will be calculated by deducting the NYISO DSS losses from the reported peak load. MES loads are reported net of losses.

2.3.3 Accounting for BTM:NG Resources

The load of a BTM:NG resource that obtains power from an LSE or TO during the NYCA peak will be deducted from the actual load of the LSE or TO, even if the Resource does not offer Net-ICAP into the market (*e.g.*, when BTM:NG Resources offer only Energy to the wholesale markets).

Commented [A38]: New Section needed for Accounting for the Market Participating DER resources. We should know by also know by August 1 the capacity year elections for new CRIS capable DER Aggregations.
Add subsection 2.3.4 to include DER Aggregations comprised of injection resources that want to participate in ICAP market

However, if by August 1st of the current Capability Year a BTM:NG Resource elects, pursuant to NYISO Procedures, not to participate as a BTM:NG Resource in the upcoming Capability Year, the ACHL of a BTM:NG Resource for the current Capability Year will be added to the actual load and Adjusted Actual Load of the LSE or TO in which the BTM:NG Resource is located. This adjustment shall be made after accounting for any BTM:NG Resource load served by a TO or LSE.

2.3.4 Accounting for Facilities Transitioning from and to a Retail Load Modifier into Aggregations in the ICAP Market

The generation values associated with retail load modifying generating facilities seeking to participate in an Aggregation will be added to the forecasted load of the Transmission District in which it is located as follows:

1. NYISO will compute the average of the retail load modifying generating facilities' generation during its top 20 generating hours that occur during the highest 40 one-hour NYCA peak load~~s~~ hours for the current Capability Year. This is the Peak Proxy Generation. In the event that no historical generation data is available, the Peak Proxy Generation for such ~~a~~ unit will be set to the 75% of its rated output;
2. The Peak Proxy Generation will be added to the final ICAP Market Forecast for each Transmission District;
3. Regional Load Growth Factors will not be applied to Peak Proxy Generation.

Conversely, the generation values associated with facilities seeking to leave an Aggregation and become retail load modifiers will be subtracted from the forecasted load of the Transmission District in which it is located as follows:

1. NYISO will compute the average of the generating facilities generation during its top 20 generating hours that occur during the highest 40 one-hour NYCA peak load hours for the current Capability Year (Peak Proxy Generation);
2. The Peak Proxy Generation will be subtracted from the final ICAP Market Forecast for each Transmission District;
3. Regional Load Growth Factors will not be applied to Peak Proxy Generation.

Commented [A39]: As written, this only applies to heterogeneous aggregations. Is that the intent? Or all Aggregations?

Commented [A40R39]: By sayings Aggregations, it includes all types

Commented [A41R39]: That is correct. Both Heterogenous and Homogeneous need to be accounted for in the forecast.

Commented [A42]: Is this meant to say that the RLGF is not applied to the Peak Proxy Generation? Perhaps "Regional Load Growth Factors will not be applied to Peak Proxy Generation" is cleaner?

Commented [A43]: Is this meant to say that the RLGF is not applied to the Peak Proxy Generation? Perhaps "Regional Load Growth Factors will not be applied to Peak Proxy Generation" is cleaner?

~~2.3.4~~2.3.5 Deduction of Station Power

Station Power delivered that is not being self-supplied pursuant to Section 4.2.3 of the ICAP Manual shall be deducted by TOs and MES~~e~~s in calculating LLL. The Generator to which the deduction pertains and the amount of the deduction shall be reported to the NYISO.

~~2.3.5~~2.3.6 Evaluation of TO and MES Weather-Normalized Load and Losses

The NYISO shall also adjust Transmission District actual peak loads for the effects of weather and will produce its own estimate of the weather-normalized load for each TO. These estimates will be produced

using models and design criteria the NYISO develops. The NYISO will compare its own estimates with those submitted by the TOs according to Subsection 2.2.4 of this manual using two comparisons:

- If the adjustments to the actual load calculated by the NYISO and a TO pursuant to Section 2.3 of this manual differ by 25% or less, the NYISO will accept the submitted estimate;

Or

- If the weather-normalized adjusted load calculated by the NYISO differs from that calculated by the TO or MES by 1% or less, the NYISO will accept the submitted estimate.

If the differences between the NYISO and TO or MES calculations of both the actual load and the weather normalized exceed the above thresholds, the NYISO and TO or MES will investigate and attempt to reconcile it.

If it is not possible to reconcile the difference within a period of time that comports with the development of the respective peak load forecast, the NYISO will use its own estimate of the weather-normalized load for that TO. The TO may dispute the NYISO's decision to substitute its weather-normalized load for the TO's, pursuant to the Expedited Dispute Resolution Procedures specified in the *NYISO Services Tariff*, Section 5.17.

If an MES does not submit a weather-normalized load, the NYISO will calculate one for it by applying the ratio of (a) the weather-normalized to actual load of the TO in whose Transmission District the MES is located to (b) the MES actual load.

Transmission District losses will be weather-normalized for each TO and all other Load Serving Entities, Municipal Energy Systems and BTM:NG Resources in the Transmission District using the same proportion of weather-normalized load to actual load as was determined for the primary TO in that Transmission District.

~~2.3.6~~2.3.7 Allocation of Weather-Normalized Losses to TOs and MESs

The total of all TO and MES weather-normalized loads will be calculated by the NYISO. The sum of the calculation is the NYCA weather-normalized peak load less losses (W/N LLL). The total of all weather-normalized losses will be calculated by adding all TO weather-normalized losses.

Total weather-normalized losses will be allocated to each TO and MES according to the ratio of its W/N LLL to the NYCA W/N LLL. The result will be the weather-normalized load plus losses (W/N L+L) for each TO and MES and will be the Adjusted Actual Load for the TO, MES and Transmission District.

The sum of Adjusted Actual Load for all Transmission Districts ~~all TO and MES W/N L+Ls~~ will be the NYCA Adjusted Actual Load for the Capability Year.

~~Each~~ The Adjusted Actual Load for the TO, MES and Transmission District ~~Each TO and MES W/N L+L~~ will be the basis upon which its RLGF will be applied by the NYISO to calculate respective TO, MES and Transmission District ~~or MES~~ forecasted load coincident with the NYCA peak in the next Capability Year.

~~2.3.7~~2.3.8 Evaluation of TO and MES Regional Load Growth Factors

The NYISO will evaluate Capability Year RLGFs using the following criterion:

1. *Criterion 1: Index of Recent Historical Peak Load Growth* – RLGFs should be within a range of historical year-to-year growth rates of actual adjusted peak load (AAPL) experienced in the previous five Capability Years.
2. *Criterion 2: Projection of Peak Load Growth in Relation to Economic Growth*– The NYISO will clearly outline for all Market Participants (MPs) the economic parameters it will use in developing these relationships, no less than 15 calendar days before the date the TOs and MESs are required to submit RLGFs. Criterion 2 predicts the RLGF using a regression model estimated from historical data for a period of at least five years and up to 15 years. The regression model will include predicted growth in economic indicators, as provided to the NYISO by its economic forecasting consultant along with other relevant data as determined by the NYISO. Criterion 2 reflects the projected load growth for the next Capability Year relative to the current Capability Year.
3. *Criterion 3: Projections performed by NYISO* – The NYISO will develop independent projections of RLGFs and use them in evaluating the RLGFs submitted by the TOs and MES~~e~~s pursuant to Subsection 2.1 of this manual. The NYISO will post on the NYISO website for all MPs the assumptions and methodologies used to develop its projected RLGFs for each Transmission District.

The NYISO will develop a range for each of the three criteria above. The ranges for Criterion 1 shall be based upon the second highest and second lowest of the five annual growth rates calculated. The acceptable range for Criterion 2 shall be generally defined as the 25th to 75th percentiles of predicted growth as calculated using the standard error of the regression model developed by the NYISO. The minimum range of each of the three Criteria shall be 1%. In the event that the ranges for Criterion 1 and Criterion 2 are mutually exclusive, the NYISO will construct an alternate Criterion by combining the ranges

of Criterion 1 and Criterion 2. The upper and lower bounds of the combined Criterion shall typically be calculated by averaging the upper bounds of Criterion 1 and Criterion 2, and averaging the lower bounds of Criterion 1 and Criterion 2. The NYISO may also take into account additional factors when establishing the ranges for Criteria 2 and 3.

If the NYISO determines that a TO or MES forecast is not within the established range for at least two of the three criteria above, the NYISO and the TO or MES will attempt to reconcile and explain the difference. In the event that Criterion 1 and Criterion 2 are combined, then it is sufficient for the RLGF to satisfy either the combined Criterion or Criterion 3. If the difference cannot be reconciled, the NYISO will inform the TO or MES of that fact and that it intends to substitute its RLGF for the submitted one. The TO or MES may dispute the NYISO's decision to substitute the NYISO RLGF, pursuant to the Expedited Dispute Resolution Procedures specified in the *NYISO Services Tariff* Section 5.17.

The RLGF for a BTM:NG Resource will be that of the Transmission District in which it is located.

If, as a result of the deliberations between the NYISO and TO required under Section 5.17.1 of the *NYISO Services Tariff*, the NYISO decides to accept a TO forecast that does not fall within the range provided for at least two out of three above criteria, any MP may dispute that decision pursuant to the Expedited Dispute Resolution Procedures specified in the *NYISO Services Tariff,* Section 5.17 (available from the NYISO Web site at the following URL: https://www.nyiso.com/regulatory-viewer).

The only RLGFs that may be disputed under the Expedited Dispute Resolution Procedures are those developed by the TO or MES and the NYISO.

~~2.3.8~~2.3.9 Installed Capacity Market Forecast of TO, MES, ~~and~~ BTM:NG Resource, and Aggregations at Time of Predicted NYCA Peak

First, t~~T~~he NYISO will calculate a forecast of each TO and MES load during the hour and on the date of the forecast NYCA peak for the next Capability Year as the product of (a) the ~~W/N L+L~~ Adjusted Actual Load for each TO and MES, as determined in Section 2.3.8 of this manual, and (b) the RLGF determined for the respective TO or MES, calculated in Section 2.3.9 of this manual. ~~The sum of the TO and MES peak forecast loads during the hour and on the date of the NYCA peak~~ Second, the sum of projected load changes from DER resources transitioning to and from Aggregations will be added to each TOs forecasted peak value as applicable. The NYCA Installed Capacity peak load forecast for the Capability Year will be the sum of the TO and MES forecasted loads during the hour of the NYCA peak.

Commented [A44]: VR: RLGF: Regional Load Growth Factor
Same for DER Aggregations comprised of Demand resources? Maybe not for the ones including Gens. Confirm.

Commented [A45R44]: CA: RLGFs do not apply to the DR DER loads

Commented [A46]: Edited this section.

Commented [A47R46]: Thanks. This will need to be updated once the large load language is expected to be approved in November/December 2022

BTM:NG Resource Load is not considered in the calculation of the ICAP Market forecast because the Resource is required to satisfy all of its Host Load, and therefore contributes 0 MW to the Load at the time of the NYCA Peak. This exclusion of BTM:NG Resource Host Load from the ICAP Market forecast is different from the treatment of BTM:NG Resource Host Load for the purposes of determining the Installed Reserve Margin.

~~2.3.9~~2.3.10 Forecast of Locality Peaks

To determine LSE Locational Unforced Capacity Requirements, Locality peaks forecasts need to be determined. The NYISO shall determine the forecasts of the peaks for the Localities as follows:

1. Each TO and MES in a Locality will provide an actual and weather-normalized peak for its Load in the Locality.
2. The adjustments to actual load shall include Load reductions due to dispatchable load management programs and BTM:NG Resources, as follows:
   a. The NYISO will add back to the Locality Peak load the following data for any SCRs, DADRP, EDRP, ~~or~~ DSASP ~~resources~~, or demand response facilities participating in an Aggregation:
      i. Load reductions resulting from activation of the SCR Program and EDRP during the Locality peak;
      ii. The output of any Local Generators that participate in NYISO SCR program operating during the date and time of the Locality peak when the NYISO has not activated its Demand Response programs; and
      iii. Load reductions of EDRP resources and SCRs resulting from activation of Transmission Owner-administered retail demand response programs occurring during the Locality peaks. Load reductions achieved by resources participating only in the Transmission Owner-administered demand response programs will not be added back.
      iv. Load reductions during the date and time of the Transmission District and NYCA peaks from Demand Side Resources participating in an Aggregation. Load reductions achieved by demand response resources participating only in the Transmission Owner-administered demand response programs will not be added back.
   b. The TO or MES shall adjust its actual Locality Peak for the verified load reductions of EOPs or dispatchable load management programs of any LSE or RIP in its Transmission District, if these impacts were submitted in accordance with Section 2.2.6 of this manual.

Commented [A48]: VR: Add load reductions due to Aggregations comprised of DRs? How to account for them?

Commented [A49R48]: CA: All aggregations will be required to meter DR separately. Add DR needs to be added back. Added proposed language.

Commented [A50]: VR: Replaced DADRP and DSASP with DER Aggregations comprised of Demand side resources

Commented [A51R50]: CA: Added proposed language.

Commented [A52R50]: After transition period, remove language related to DADRP and DSASP programs

Commented [A53]:

Commented [A54R53]: Made consistent with earlier language

Commented [A55]: CA: Added language for DR within DER Aggregations.

c. The TO or MES shall adjust its actual Locality peak for the load reductions of EOPs and dispatchable load management programs that it implemented.

d. The load of a BTM:NG Resource that obtains power from an LSE or TO during the Locality peak will be deducted from the actual load of the LSE or TO, even if they do not have Net-ICAP to offer in to the market (*e.g.*, when BTM:NG Resources offer only Energy to the wholesale markets).

3. The TO or MES Losses in the Locality shall be weather-normalized, but should not be otherwise adjusted in relation to Losses elsewhere in the NYCA.
4. The TO shall determine its Adjusted Actual Peak Load (AAPL) within the Locality by accounting for the effects of weather on Loads and Losses, and after adjusting for reductions of dispatchable load management programs as set forth in this Subsection 2.3.9, item.2.
5. The NYISO shall also adjust actual Locality peak loads for the effects of weather normalization and will produce its own estimate of the weather-normalized load for each TO and MES. These estimates will be produced using models and design criteria the NYISO develops.
6. The NYISO shall then review each TO's and MES' AAPL for the Locality. In the event of a difference that exceeds both one percent (1%) of the AAPL and twenty-five percent (25%) of the adjustment, the NYISO and TO or MES will investigate and attempt to reconcile the difference. If it is not possible to reconcile the difference within a period of time that comports with the development of the respective peak load forecast, the NYISO will use its own estimate of the AAPL for the Locality peak. The TO or MES may dispute the NYISO's decision to use its AAPL, pursuant to the Expedited Dispute Resolution Procedures specified in the *NYISO Services Tariff*, Section 5.17.
7. The TO will use the RLGF for the Transmission District in which the Locality is located, as determined in Section 2.3.9.
8. The Locality Peak forecast shall be calculated as the product of the AAPL in the Locality and the applicable RLGF.

2.4 Load Forecasts for Installed Reserve Margin Study and for Locational Capacity Requirements Study

Commented [A56]: Added updates for the LCRs now being computed and assigned from the Fall forecast update.

In addition to the ICAP Market Forecast described in Section 2.3 of this Load Forecasting Manual, the NYISO produces another distinct two load forecasts that includes include the ACHL and the Load and Generation attributes of each BTM:NG Resource. The other This e first load forecast is prepared for use in the Installed Reserve Margin (IRM) Study conducted by the New York State Reliability Council. The second

load forecast provides an update to the first, and is also used for use in the Locational Capacity Requirements (LCR) Study conducted by the NYISO. The load forecasts produced for those two studies will include the ACHL of each BTM:NG Resource for the most recent Capability Year available. Including the Load and Generation attributes for these Resources provides for their accurate representation in these studies.

3. Data Submission Requirements for the NYCA DER Capacity Tracking

This section describes the following:

1. Notification procedures to be followed by the NYISO
2. Data submission requirements for TOs and DER Aggregators

3.1 Notification Procedures to be Followed by the NYISO

The DER Installed Capacity for purposes of this section of the *Load Forecasting Manual* is defined to be the expected maximum generating capability of an individual DER facility identified in the TO interconnection queues or the NYISO Interconnection Queue. The DER capacity and locational attributes data updates will be provided by the 1st business day of each month.

Information and data provided to TOs by the NYISO will include:

1. **Transmission District Geographical Reference Information:** Each year the NYISO will release a list of valid counties and zip-codes that geographically intersect (*i.e.*, overlap) each transmission district's area. This data will be used by both the NYISO and the TOs to reconcile project locations (*e.g.*, New York Counties and NYISO Load Zones). The NYISO may update this data quarterly if significant updates to NY regional zip-codes warrant an update.

3.2 Data Submission Requirements for TOs and DER Aggregators

TOs shall submit to the NYISO via email or through the NYISO's web based interface, updates to new and existing interconnected DER facilities monthly. These updates shall encompass all interconnected facilities (*i.e.*, both facilities seeking to participate in an Aggregation and those intending to be load modifying). The DER facilities listed on both the New York State Standard Interconnection Request and the TO interconnection queues shall be provided[2]. This data shall be made available in a comma separated value file format specified by the NYISO. If submitting via email, the data shall be sent to Demand_Forecasting@nyiso.com.

The following information groups are requested for each interconnected DER facility:

[2] The Standardized Interconnection Requirements applies to interconnection of distributed generators and/or energy storage systems 5 MW or less connected in parallel with utility distribution systems. Projects above 5 MW in size and not subject to the NYISO Interconnection requirements are managed by the Transmission Owner interconnection process.

Commented [A57]: Is it the DER or the asset (sub-component within a DER)?

Commented [A58R57]: Asset is desired. Some DER projects listed on the utility interconnection queues are hybrid projects that contain more than one asset (e.g. PV + Storage).

Commented [A59R57]:

Commented [A60R57]: Removed mention of asset, DER facilities in the utility interconnection queue listings don't contain asset level information.

Commented [A61]: What does this mean?

Commented [A62R61]: Clarified to mean geographical area overlap between a zip codes, counties, and transmission district areas. We are providing a base dataset that we can all reconcile on for appropriate county assignments of the DER resources which are important for the NYISO's existing and future BTM solar forecasting system and long-term solar capacity/impact forecasts in the Gold Book.

Commented [A63R61]:

Commented [A64R61]: Clarified sentence

Formatted: NL Item, Indent: First line: 0.25"

1. Interconnection Project Number: A unique project number associated with the facility.
2. Locational Attributes: The address information associated with the DER facility (*e.g.*, zip-code and County)
3. Electrical Connectivity Information: The connecting circuit id, NYISO Load Zone, and substation name (if available), type of metering installed at the project (*e.g.*, Net Metering, Remote Net Metering, or Community Distributed Generation, Individual Metering if available)
4. Project Timeline and Facility Status: The interconnection completed application date and project completion date (*i.e.*, synchronization date of the facility). The status of the facility shall indicate if the project is completed or retired/withdrawn.
5. DER Generator Type and Capacity Information: The total nameplate capacity of the facility in kW AC shall be provided. The type of generation present at each facility shall be indicated. For a facility where more than one of the following generator types are present (*e.g.*, for a hybrid/mixed facility), the nameplate capacity of each type in kW AC shall be provided:
   i) Solar
   ii) Energy Storage
   iii) Wind
   iv) Microturbine
   v) Synchronous Generator
   vi) Induction Generator
   vii) Farm Waste
   viii) Fuel Cell
   ix) Combined Heat and Power
   x) Gas Turbine
   xi) Hydro Electric Generator
   xii) Internal Combustion Engine
   xiii) Steam
   xiv) Other (i.e., not of the types listed above)

Aggregators shall submit to the NYISO through the NYISO's web based interface which existing interconnected projects they wish to enroll in an Aggregation monthly. The following process will be followed by an Aggregator to mark an individual facility ready for association with an Aggregation:

Commented [A65]: I think this should be "i.e.," unless there are other types of geographic coordinates that we would accept.

Commented [A66R65]: Agreed - Lat/lon are pretty standard fields

Commented [A67]: Not publicly available, would prefer geocords be left out

Commented [A68]: Not publicly available, would prefer be left out

Formatted: Indent: Left: 0.56", Space Before: 2 pt, No bullets or numbering

1. Aggregator accesses the NYISO DER information portal and identifies one or more facilities for desired enrollment an aggregation.
2. Aggregator adds their Aggregator ID to each facility they wish to enroll in an Aggregation.
3. Aggregator reviews and updates the maximum summer and winter net generation capability information and submits the information for NYISO review.

3.3 Data Review and Reconciliation Requirements

The NYISO will review and perform basic information integrity and consistency checks on the information provided within 5 business days of receipt of the updated information. The TOs and Aggregators will then have 5 business days to clarify the information and/or provide updates to the DER facility information in question. Upon satisfactory review of the new and updated project information from the TOs and Aggregators, the DER facility information can be updated in the NYISO's Aggregation system.

Commented [A69]: Just wanted to flag that this seems like a short timeline.

Commented [A70R69]: Agreed, I think by the 15th of the month???? That is two weeks, but gets you near the next monthly cycle.

Formatted: Indent: First line: 0"