

NYISO 2016 Interim Review

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of

Resource Adequacy

Covering the New York Balancing Authority

For the period 2017 to 2020

NPCC RCC Approved

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NYISO 2016 Interim Review

EXECUTIVE SUMMARY

This report provides the results of the New York Independent System Operator's (NYISO) 2016 Interim Review of Resource Adequacy covering the period from 2017 to 2020. It is the NYISO's first Annual Interim Assessment of its 2015 Comprehensive Review of Resource Adequacy, which covered the time period of 2016 through 2020. This assessment is conducted to comply with the Reliability Assessment Program established by the Northeast Power Coordinating Council (NPCC). This assessment follows the resource adequacy guidelines outlined in NPCC's Regional Reliability Reference Directory #1, Appendix D.¹

The 2016 Interim Review Report demonstrates that New York will meet the NPCC resource adequacy criterion that the probability of disconnecting load due to resource deficiencies, which is known as the loss of load expectation (LOLE) criterion, shall be, on average, no more than 0.1 days per year for the Base Case.

¹ <https://www.npcc.org/Standards/Directories/Forms/Public%20List.aspx>

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1. Introduction

The 2016 Interim Review provides the first update of the NYISO’s 2015 Comprehensive Review of Resource Adequacy which was approved by NPCC in December 2015. Since the approval of the 2015 Comprehensive Review, the NYISO has conducted additional resource adequacy assessments as part of the Comprehensive System Planning Process (CSPP)² and additional annual studies to determine the Installed Capacity Requirements for the New York Balancing Area (NYBA). The major assumptions of this interim review are consistent with those studies with revisions to incorporate updated data that have met Base Case inclusion rules as defined by the CSPP.

2. Assumption Changes

2.1. Load Model

Tables 2-1 and 2-2 compares the peak demand forecasts from the 2015 Comprehensive Review with the 2016 Load and Capacity Data Report³ (Gold Book) baseline and high load peak demand forecasts for this Interim Review. The 2016 baseline forecast includes the impacts of energy efficiency, distributed energy resources, and behind-the-meter solar PV, while the high load forecast does not. This baseline forecast represents an annual average growth rate of 0.21 percent over the Gold Book’s ten-year horizon. This compares to a growth rate of 0.48 percent from the rate of growth reported in the 2015 Comprehensive Review. For this Interim Review, the solar PV MW forecast was added back to the baseline forecast and the solar PV is modeled as a generating resource. There were no changes to the multiple load shape model from the 2015 Comprehensive Review. The same years (2006, 2002, and 2007) are used in this review as were used in the 2015 Comprehensive Review.

Table 2-1 Comparison of Baseline Peak Demand Forecasts

Year	Baseline Forecast (MW)						
	2015 Comprehensive Review	2016 Interim Review Baseline Forecast without Solar PV	Delta	Solar PV Forecast (total)	Solar PV Forecast (at time of peak)	2016 Interim Review Baseline Forecast Including Solar PV	Net Change
2017	34,766	33,363	-1,403	1,348	363	33,726	-1,040
2018	35,111	33,404	-1,707	1,615	421	33,825	-1,286
2019	35,454	33,477	-1,977	1,862	471	33,948	-1,506
2020	35,656	33,501	-2,155	2,096	518	34,019	-1,637

² See Attachment Y of the OATT, available at https://nyisoviewer.etariff.biz/ViewerDocLibrary//MasterTariffs/9TariffSections/OATT%2031.1%20FID1144%20wo1065%201009_16289.pdf

³ 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

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2-2 Comparison of High Load Peak Demand Forecasts

High Load Forecast (MW)			
Year	2015 Comprehensive Review	2016 Interim Review	Delta
2017	35,691	34,533	-1,158
2018	36,202	34,922	-1,280
2019	36,697	35,243	-1,454
2020	37,057	35,487	-1,570

2.2. Resources

For this review, resource assumptions are based upon the 2016 summer capability ratings of generation resources in the NYBA as reported in the 2016 Gold Book. Capacity values in Table 2-3 include resources electrically internal to the NYBA, additions, re-ratings, retirements, purchases, sales, UDRs (UCAP Deliverability Rights) with firm capacity, and SCRs (Special Case Resources).

The 2016 Gold Book reports generator deactivations of 1,743 MW in 2017. The generator deactivations include two nuclear units (FitzPatrick @ 853 MW and Ginna @ 581 MW) that have announced their intent to deactivate in 2017. Both of these units have since entered into sale agreements and, pending the outcome, may remain in service in 2017 and beyond. For the purposes of this assessment, the NYISO is taking the more conservative approach of considering the units deactivated.

A total of 1,097 MW of new or additional generation (318 MW in 2017 and 779 MW in 2018) will be in service over the assessment period. In 2017, Marble River Wind (215 MW), a current energy only unit, will qualify as a capacity resource. In addition, various unit rerates of 103 MW will be in service for 2017. New generation of 779 MW (CPV Valley Energy Generation @ 680 MW, Taylor Biomass @ 19 MW, and Copenhagen Wind @ 80 MW) meet the study inclusion rules and are scheduled to initiate service in 2018.

Table 2-3 Comparison of Resource Assumptions (Summer MW ratings)

Year	2015 Comprehensive Review (MW)	2016 Interim Review ⁴ (MW)	Delta (MW)
2017	42,507	39,965	-2,542
2018	42,507	40,476	-2,031
2019	42,507	40,485	-2,022
2020	42,507	41,147	-1,360

⁴ Note: Wind units are listed at their Capacity Resource Interconnection Service (CRIS) rating.

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2.3. Transmission

The power flow study base cases were developed in accordance with NYISO procedures using projections for transmission facilities that were developed in conjunction with Market Participants and Transmission Owners. These were included in the base case using the NYISO's 2016 FERC 715 filing as a starting point, and consistent with the base case inclusion screening process provided in the NYISO's Reliability Planning Process (RPP) Manual.

The following transmission projects are currently in progress: a) addition of 21% series compensation on the Leeds – Hurley Avenue 345 kV (301) line at Hurley Avenue, (in service starting in 2018);⁵ b) Con Edison's installation of a new phase angle regulator (PAR) in the control path between Rainey 345 kV and Corona 138 kV stations, which will consist of a 345/138 kV transformer and 138 kV PAR at Rainey with a 138 kV cable to Corona (in service starting in 2019); c) an Orange and Rockland (O&R) North Rockland station tapping the Ladentown - Buchanan South 345 kV line (Y88), which will include a 345/138 kV transformer that will connect to the existing O&R Lovett substation (in service starting in 2018); and d) NYSEG/RGE's terminal upgrades, which will increase the ratings on Stolle Rd-Gardenville 230 kV Line #66 and on both Clay-Pannell PC1 and PC2 345 kV lines.

The National Grid installation of 1.5% series reactors at Packard on the two Packard – Huntley 230 kV lines (77 and 78) was completed and these devices are currently in-service. In the 2015 Comprehensive Report, the NYISO identified the Transmission Owner Transmission Solutions (TOTS) consisting of three primary projects that would be in service by summer 2016. Two of the projects were completed and are in service. The other project was the Staten Island Unbottling project, which included additional cooling capability on the 345 kV cables from Farragut to Gowanus and from Gowanus to Goethals to increase the thermal ratings of these facilities. Due to the subsequent cancellation of the wheeling agreement between Con Edison and PSEG, Con Edison is no longer proceeding with the cooling project.

2.4. Unit Availability

Table 2-4 compares the 5-year weighted EFORD (Equivalent Demand Forced Outage Rate) values for generation units in the NYBA included in this Interim Review to the EFORD values used in the 2015 Comprehensive Review. The EFORD for thermal units and large hydro units is calculated from NERC GADS data submitted by the generator owners. Run of river hydro units are given a 45% derate. Production wind data from 2011 through 2015 is used to determine the capacity factor for summer and winter capability seasons. Wind capacity factors are ~17% and ~30%, respectively. A performance factor for SCRs is determined based upon their actual load reduction in either required system tests of their capability to reduce load or actual demand response activation calls.

⁵ This project is a System Deliverability Upgrade (SDU) associated with the CPV Valley Energy Center generation project.

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Table 2-4 5-Year Weighted EFORd values (%)

Unit Type	Summer DMNC Rating (MW)	2015 Comprehensive Review	2016 Interim Review
Coal	1,017	5.4	8.8
Oil	851	6.2	7.9
Gas ⁶	17,501	19.7	19.2
Nuclear	5,402	2.7	2.4
Combustion Turbines	2,667	22.4	22.9
Jet Engine	2,103	14.5	14.4
Combined Cycle	1,455	4.2	4.1
All Thermal Units (weighted 5-Year EFORd)	30,996	6.6	6.7

3. Gas Infrastructure Adequacy Assessment

Every fall, the NYISO issues a seasonal fuel adequacy survey to Generation Asset Owners requesting expected dual-fuel capability, the level of gas transportation service, starting alternative fuel inventories, and arrangements for alternative fuel replenishments. The NYISO also independently tracks the permitting status of generating units to confirm dual-fuel capability. Based on these data sources, the 2016 Gold Book reported dual-fuel capability of 18,211 MW (Summer DMNC) and oil-only capability of 2,578 MW (Summer DMNC). Thus, the summer capability of oil and dual-fuel units with oil permits totals 20,789 MW. These oil and dual-fuel facilities represent a fleet of resources that can respond to delivery disruptions on the gas pipeline system during both summer and winter seasons.

4. Environmental Initiatives

There are several environmental regulatory programs that could impact the manner in which the existing generating fleet operates, or that may require retrofitting environmental control technologies in

⁶ Includes dual fuel units that can burn oil as well as gas.

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order to comply with the new requirements. These state and federal regulatory initiatives cumulatively may require considerable investment by the owners of New York’s existing thermal power plants in order to comply. If the owners of those plants have to make considerable investments, those investment decisions could impact whether they remain in the NYISO’s markets and thereby potentially affect the reliability of the Bulk Power System. Of eight regulatory programs reviewed, the NYISO identified five programs that may impact the NYBA over the assessment period.

Table 4-1 summarizes the impact of these environmental regulations. Approximately 27,500 MW of CRIS capacity may be affected to some extent by these regulations.

Table 4-1 Summary Impact of Environmental Initiatives

Program	Status	Compliance Deadline	Approximate CRIS Capacity
Mercury and Air Toxics Standard	In effect	April 2015/2016/2017	1,000 MW
Cross-State Air Pollution Rule	In effect	January 2015 and 2017	23,100 MW
Regional Greenhouse Gas Initiative	In effect	In effect	23,200 MW
NYC Residual Oil Elimination	In Permitting	2020	3,100 MW
Best Technology Available	In effect	Upon permit Renewal	4,300 MW

Using publicly available information from USEPA and USEIA, the NYISO further identified the units that may experience other impacts from the environmental regulations. Such impacts would be addressed through operational measures, as applicable.

- *MATS/MRP Program*: Given the current outlook for the continued attractiveness of natural gas compared to heavy oil, it is anticipated that compliance can be achieved by dual-fuel capable units through the use of natural gas to maintain fuel ratios that are specified in the regulation.
- *RGGI*: The impact of RGGI may increase the operating cost of fossil fueled units.

5. Results

General Electric’s Multi-Area Reliability Simulation (GE-MARS) is the computer software program used for probabilistic analysis by the NYISO. Table 5-1 summarizes the Loss of Load Expectation (LOLE) results produced by the GE-MARS program comparing the 2015 Comprehensive Review results with the 2016 Interim Review for the Base Case and the high load forecast case results.

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Table 5-1 LOLE Results

Year	Base Case Forecast		High Load Forecast	
	2015 Comprehensive Review	2016 Interim Review	2015 Comprehensive Review	2016 Interim Review
2017	0.03	0.04	0.06	0.09
2018	0.04	0.03	0.08	0.10
2019	0.05	0.03	0.10	0.11
2020	0.05	0.02	0.14	0.10

6. Conclusion

This Interim Review finds that the New York Balancing Authority will comply with the NPCC resource adequacy criterion under the Base Case peak demand forecast. The primary driver is the decrease in the summer peak baseline load forecast. The NYISO will continue to monitor and evaluate progress on pending environmental initiatives and the implications of generator compliance with final initiatives to understand their impact, if any, on capacity availability and retirements. Should the NYISO determine that conditions have significantly changed during or outside of the normal planning cycle, it will determine whether market-based solutions that are currently progressing are sufficient to meet the resource adequacy and system security needs of the New York power grid or not. If not, the NYISO will address any newly identified Reliability Need in the subsequent RNA or, if necessary, issue a request for an interim, or “Gap,” solution to maintain reliability of the Bulk Power System in the New York Balancing Authority.