Attachment III
Management Committee Presentation

New York ISO
Independent System Operator

Virtual and External Transactions – Proposed Changes

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Background

- **In April 2009 the following modifications were made to the Virtual Transactions credit requirements:**
  - Distinguished between virtual demand and virtual supply.
  - Created seasonal groupings - group months with similar risk characteristics together.
  - Created zonal groupings - group zones with similar risk characteristics together.
  - Created time of day groupings - group times-of-day with similar risk characteristics together.

- **Under the tariff revisions, the NYISO would determine the credit requirements for virtual supply and virtual demand transactions separately, adopting statistically valid groupings at the 97th percentile.**
  - The credit requirement calculation utilizes data from April 1, 2005 forward.

- **The changes resulted in credit requirements that more appropriately reflect risk based on historical virtual bidding behavior.**

- **In the 2009 filing, the NYISO committed to re-evaluating the statistical validity of the proposed groupings and determining the appropriate number of months of Energy price data to include in the price differential data sets for the purpose of recalculating and updating the price differentials once six years of Energy price data had been accumulated.**

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Background (continued)

- In 2016-2017, the NYISO performed an analysis on potential updates to the look back period, as well as the hourly, zonal and seasonal groupings.

- In April 2017, the NYISO presented proposed changes to the Credit Policy Working Group.
  - 04-21-2017 Credit Policy Working Group (link)

- Due to competing priorities, the NYISO postponed further evaluation of the proposed changes until after the EMS/BMS deployment.

- In 2022, the NYISO updated the 2016 analysis to include market data through December 2021.

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NYISO Credit Policy Considerations

- **Should the NYISO consider a change in the look back period used in calculating credit requirements to use more recent data than data from April 1, 2005 forward?**
  - If so, should the credit requirement be based on a weighted average of look back periods?

- **Should other changes be made to the credit requirement calculations for Virtual Transactions, such as changes to:**
  - Hourly groupings
  - Zonal groupings
  - Seasonal groupings

- **Should the NYISO adjust the 97% threshold upwards to better cover virtual supply and/or virtual demand positions?**

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Proposed Credit Policy

- **The NYISO recommends changes to the following components of credit requirements for Virtual Transactions:**
  - Hourly groupings
  - Look back period
  - Zonal groupings
  - 97% threshold for virtual supply positions

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Hourly Grouping Analysis

- **Current Virtual Transaction credit requirements are based on the application of six hourly groupings to the historical price data.**
  - Weekdays: HB 7-10, 11-14, 15-18 and 19-22
  - Weekends/Holidays: HB 7-22
  - Overnights: HB 23-6

- **The NYISO analyzed several alternative hourly groupings for weekdays, weekends/holidays, and overnights.**

- **The NYISO analyzed hourly groupings by the current seasons.**
  - Summer Months – May, June, July, August
  - Winter Months – December, January, February
  - Shoulder Months – March, April, September, October, November

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Hourly Grouping Analysis (continued)

- In its 2016 analysis, the NYISO developed alternative hourly groupings by examining the proportion of outcomes for each individual hour that fell outside the 97% threshold calculated for the current hourly groupings.

- The hourly groupings recommended by the NYISO in 2016 for both virtual demand and virtual supply positions were as follows:
  - Summer peak hours: HB07-09; 10-11; 12-13; 14-17; 18-20; 21-22
  - Summer night hours: HB00 and 23; 01-06
  - Summer weekend hours: HB13-19; all other hours
  - Winter peak hours: HB07-09; 10-12; 13-15; 16-17; 18-20; 21-22
  - Winter night hours: HB02-04; all other hours
  - Winter weekend hours: HB16-20; all other hours
  - Shoulder peak hours: HB07-10; 11-14; 15-19; 20-22
  - Shoulder night hours: HB00, 06, and 23; 01-05
  - Shoulder weekend hours: HB17-20; all other hours

- The NYISO recommends these hourly groupings for Virtual Demand.

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Hourly Grouping Analysis (continued)

Current and 2016 Alternative Hourly Groupings

		Summer	Winter	Shoulder
Current	Weekday Peak	HB07-10 HB11-14 HB15-18 HB19-22		
	Night	All		
	Weekend & Holiday	HB07-22		
Alternative – Virtual Supply and Virtual Demand	Peak	HB07-09 HB10-11 HB12-13 HB14-17 HB18-20 HB21-22	HB07-09 HB10-12 HB13-15 HB16-17 HB18-20 HB21-22	HB07-10 HB11-14 HB15-19 HB20-22
	Night	HB00,23 HB01-06	HB02-04 Other HB23-06	HB00,06,23 HB01-05
	Weekend & Holiday	HB13-19 Other HB07-22	HB16-20 Other HB07-22	HB17-20 Other HB07-22

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Hourly Grouping Analysis (continued)

- The NYISO performed additional analysis on several hourly groupings with low coverage on virtual supply positions at the 98th percentile (see Appendix for full analysis).

- The updated hourly groupings analyzed for virtual supply positions are as follows:
  - Summer peak hours: HB07-09; 10-12; 13-17; 18; 19-20; 21-22
  - Summer night hours: HB00 and 23; 01-06
  - Summer weekend hours: HB07-08; 09-12; 13-14; 15-16; 17-18; 19-22
  - Winter peak hours: HB08-09; 10-12; 13-15; 16-17; 18-20; 21-22
  - Winter night hours: HB00, 01 and 23; 02-05; 06-07
  - Winter weekend hours: HB16-20; all other hours
  - Shoulder peak hours: HB07-10; 11-14; 15-19; 20-22
  - Shoulder night hours: HB00, 06, and 23; 01-05
  - Shoulder weekend hours: HB17-20; all other hours

- The analysis found that certain changes in Summer and Winter would provide better coverage in volatile hours.

- The NYISO recommends these hourly groupings for Virtual Supply.

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Hourly Grouping Analysis (continued)

Current and 2022 Alternative Virtual Supply Hourly Groupings

		Summer	Winter	Shoulder
Current	Weekday Peak	HB07-10 HB11-14 HB15-18 HB19-22		
	Night	All		
	Weekend & Holiday	HB07-22		
Alternative - Virtual Supply	Peak	HB07-09 HB10-12 HB13-17 HB18 HB19-20 HB21-22	HB08-09 HB10-12 HB13-15 HB16-17 HB18-20 HB21-22	HB07-10 HB11-14 HB15-19 HB20-22
	Night	HB00,23 HB01-06	HB00,01,23 HB02-05 HB06-07	HB00,06,23 HB01-05
	Weekend & Holiday	HB07-08 HB09-12 HB13-14 HB15-16 HB17-18 HB19-22	HB16-20 Other HB07-22	HB17-20 Other HB07-22

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Hourly Grouping Analysis (continued)

- In analyzing the data since 2016, the outcomes indicate that the alternative hourly groupings recommended in 2016 would have performed better than the current groupings over the period since 2016.
  - These alternative hourly groupings were incorporated into the analysis throughout the remainder of this presentation.

- Although the hourly groupings recommended in 2016 would have performed well for virtual demand bids since that time, to improve coverage for virtual supply positions in certain seasons and hours, the NYISO recommends some adjustments to the Summer and Winter virtual supply hourly groupings relative to the 2016 alternative hourly groupings.

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Look Back Period Considerations

- Longer look back periods provide more data points for the historical analysis, enabling more accurate estimates, but longer look back periods will adjust credit requirements slowly if underlying system conditions and price volatility are changing rapidly.

- Conversely, shorter look back periods provide quicker adjustments to credit requirements as price volatility and system conditions change over time, but also can change the credit requirement dramatically when there is no change in the underlying price volatility but simply the normal variations in outcomes.

- The prospective changes to the New York transmission system and resource mix over the next decade provide support for shift to a shorter look back period so that changes in real-time price variability are reflected in credit requirements without a long delay.
  - This goal needs to be balanced with the need to accurately assess changes in price volatility.

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Look Back Period

- **Once the hourly groupings were determined, the NYISO analyzed a variety of look back periods, by season and zone, to determine what period would provide the best coverage.**
  - One-year look back period
  - Two-year look back period
  - Five-year look back period
  - Weighted look back periods

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Look Back Period Analysis (continued)

- The analysis, summarized in tables D-1, D-2, E-1, and E-2 in the Appendix, does not indicate any large differences in coverage levels between the one-year and two-year look back period.

- Overall, coverage is somewhat higher in the summer months with a two-year look back period, somewhat lower in the winter months with a two-year look back period, while the difference in coverage is extremely small in the shoulder months.

- Additionally, the analysis showed that a five-year look back period typically provided somewhat higher coverage than a one or two-year look back period.
  - These results suggested that the NYISO should consider a weighted look back design that gives more weight to outcomes in the most recent year but gives some weight to outcomes going back five years.

- The analysis also indicates that the 97% threshold does not provide adequate coverage of virtual supply positions under any look back period.

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Look Back Period Analysis (continued)

- **The NYISO analyzed alternative designs to set the credit requirement based on a blend of the credit requirements of a one-year and a five-year look back period.**
  - The long-run component prevents the overall credit requirement from falling too low when there is a transitory period of low volatility, and also prevents the requirement from rising dramatically every time there is an episode of real-time price volatility.
  - The short-run component, on the other hand, attempts to ensure that there will be some near-term change in credit requirements in response to a change in the level of day-ahead to real-time price volatility.

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Look Back Period Analysis (continued)

- **The weighted credit requirement designs examined include:**
  - Alternative 1: 2/3 weight on one-year look back and 1/3 weight on five-year look back.
  - Alternative 2: 50% weight on one-year look back and 50% weight on five-year look back.
  - Alternative 3: 1/3 weight on one-year look back and 2/3 weight on five-year look back.

- **In addition to comparing the weighted approaches to the one-year, two-year, and five-year design, the NYISO also compared them to the most recent NYISO credit requirements for each season under the current design.**
  - The detailed analysis regarding the three alternative weighted look back periods for Virtual Supply and Virtual Demand can be found in the Appendix.

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Look Back Period Analysis (continued)

- **Summary Virtual Supply Positions Findings:**
  - The summary table indicates that the weighted designs, particularly Alternative 3, fare far better than the credit requirements based on the current design or a five-year look back period and also provide a reasonable increase in coverage for the increase in relative to a one-year look back period.
  - The weighted credit requirement designs could be combined with an increase in virtual supply credit requirements based on a 98% threshold to provide better overall coverage.
- **The NYISO recommends Alternative 3 lookback period.**

		Alternative 3	Alternative 1
One Year	Summer	OK	OK
	Winter	Far better	Far better
	Shoulder	OK	OK
	Overall	Favorable	Favorable
Five Year	Summer	Far better	OK
	Winter	Far better	OK
	Shoulder	Far better	Favorable
	Overall	Far better	Favorable
Current	Summer	Far better	Favorable
	Winter	Favorable	OK
	Shoulder	OK	OK
	Overall	Favorable	OK

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Look Back Period Analysis (continued)

- **Summary Virtual Demand Positions Findings:**
  - The summary table indicates that the weighted designs, particularly Alternative 3, also fare far better than the credit requirements based on the current design or a five-year look back period and also provide a reasonable increase in coverage relative to a one-year look back period.
  - There is much less variability from year-to-year in the credit requirement ratio than for virtual supply, but there is still a lower coverage level for the one-year look back period.
- **The NYISO recommends Alternative 3 lookback period.**

		Alternative 3	Alternative 1
One Year	Summer	OK	OK
	Winter	Favorable	OK
	Shoulder	OK	OK
	Overall	Favorable	Favorable
Five Year	Summer	Far better	Favorable
	Winter	Favorable	OK
	Shoulder	Far better	Far better
	Overall	Far better	Favorable
Current	Summer	Far better	Far better
	Winter	Favorable	OK
	Shoulder	Favorable	Favorable
	Overall	Favorable	Favorable

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Zonal Grouping Analysis

- **The NYISO currently groups Zones A-F and Zones GHI to calculate Virtual Transaction credit requirements.**
  - Coverage based on those groupings was shown in Tables D-1, D-2, E-1 and E-2 in the Appendix.

- **With the changes impacting the New York transmission system and resource mix in the coming years, price variability may become systematically higher in some zones than in others.**

- **The NYISO performed an analysis by season to examine coverage using the 97th percentile and setting credit requirements individually by zone rather than across the zone groups.**
  - The detailed analysis regarding the zonal impacts can be found in the Appendix.

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Zonal Grouping Analysis (continued)

- **Outcomes:**
  - Moving from a joint zone credit requirement estimation method to an individual zone methodology has significant benefits for Zone A and Zone F coverage of virtual supply positions.
    - There could be significant benefits for coverage of virtual supply positions in other zones as the NYISO transmission system evolves over the next decade.
  - When the NYISO analyzed limiting the data period to the last three years, the benefits in coverage are more pronounced in recent years.
- **The NYISO recommends moving to an individual zone methodology.**

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Seasonal Grouping Analysis

- **The NYISO used the current Summer, Winter, and Shoulder seasons throughout the analysis.**
  - The NYISO determined that at this time the current seasonal groupings should be retained.
    - Summer = May, June, July, and August
    - Winter = December, January, and February
    - Rest-of-Year = March, April, September, October, and November

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Portfolio Analysis

- In order to assess how well covered virtual trading positions would be at the portfolio level, the NYISO conducted additional analysis to review the impact of the proposed changes to Virtual Transaction credit requirements to actual portfolios.

- This additional analysis was carried out for the following reasons:
  - The hour and zonal level analysis weights each hour and zone equally in calculating overall coverage, while actual portfolios may be concentrated in particular hours and zones or may avoid particular hours and zones, and
  - The hour-by-hour, zone-by-zone, approach does not take account of portfolio diversification effects, which may reduce the potential for uncovered losses.

- Analysis includes increasing coverage for virtual supply to the 98th percentile with the results summarized in Tables 4N and 6N in the Appendix.

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Portfolio Analysis (continued)

- **Findings:**
  - The portfolio analysis generally confirms the key patterns identified in the all hours/ all zones analysis.
  - Weighted look back Alternatives 2 and 3, combined with a 98th percentile for virtual supply, tend to perform better than the current design with slightly higher credit requirements and much lower uncovered payments due.
  - There is inadequate coverage of virtual supply positions under the current or alternative look back credit requirement designs based on a 97th percentile threshold.
  - The 2016 hourly groupings perform better than the current groupings at the portfolio level, with very slight increases in credit requirements and relatively larger decreases in uncovered payments due.

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External Transactions

- **For consistency, the NYISO also applied the Virtual Transactions recommendations to the current External Transactions credit policy.**
  - By zone/proxy bus
  - Hourly groupings
  - Seasonal groupings
  - Weighted look back period

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External Transactions (continued)

- **The coverage patterns for proxy buses are similar to what was observed in the Virtual Transactions analysis.**
  - Virtual demand coverage is generally higher than virtual supply coverage.
  - Small improvements in coverage going from the current hourly groupings in Table M-1 to the alternative hourly groupings in Table M-2, located in the Appendix.

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Credit Policy Recommendations

- Change to the 2016 alternate hourly groupings for virtual demand positions and to the updated 2022 alternate hourly groupings for virtual supply positions.
  - See Slides 7 and 9, respectively.
- Change to weighted look back period Alternative 3.
  - 1/3 weight on one-year look back and 2/3 weight on five-year look back
- Eliminate the zonal groupings and calculate separate credit requirements for each zone and proxy bus.
- Retain current seasonal groupings.
- Increase the threshold for virtual supply positions to the 98th percentile and maintain the 97th percentile for virtual demand positions.
- Apply changes to both Virtual Transactions and External Transactions.

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Next Steps

- BACWG — May 2022
- BACWG — July 2022
- BIC — Nov 2022
- MC — Nov 2022
- Board of Directors — February 2023
- FERC 205 Filing — March/April 2023
- Deployment in June 2023 contingent on FERC approval.

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Appendix

Look Back Period Analysis

- **The metric in each of the following tables represent the percentage of payments due that would be covered by the credit requirement.**
  - This result is color-coded according to the key at the right.

- **Darker green entries have higher coverage, yellow less coverage, and orange/red the lowest levels of coverage.**

- **The payments due and uncovered payments due are summed over all periods and locations, but only payments due and uncovered payments due are included in the sum.**
  - There is no offset for days on which the virtual bids were profitable.

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Look Back Period Analysis (continued)

Table D-1
Current Hourly Groupings
Summary of Coverage of Payments Due May 2007 - December 2021

			Virtual Demand		Virtual Supply	
			1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Summer	Zone	A-F	83.50%	83.33%	75.91%	75.88%
		GHI	92.57%	93.21%	68.81%	69.75%
		J	93.52%	94.02%	71.45%	73.01%
		K	89.60%	89.46%	72.79%	73.68%
	Hour Group	Peak HB07-10	88.29%	88.42%	68.92%	70.09%
		Peak HB11-14	89.47%	89.41%	65.44%	65.41%
		Peak HB15-18	90.00%	90.49%	67.06%	68.57%
		Peak HB19-22	88.20%	88.21%	75.93%	76.45%
		Weekend	87.63%	88.09%	69.20%	70.10%
		Night	84.05%	83.69%	89.18%	88.63%
		All Summer	87.77%	87.89%	72.97%	73.52%
Winter	Zone	A-F	85.70%	85.66%	73.04%	72.25%
		GHI	88.24%	87.83%	73.37%	73.37%
		J	88.83%	88.39%	74.56%	74.19%
		K	91.07%	91.01%	75.31%	76.33%
	Hour Group	Peak HB07-10	88.13%	87.87%	66.92%	65.60%
		Peak HB11-14	86.23%	86.65%	75.09%	73.35%
		Peak HB15-18	88.63%	88.14%	78.14%	77.71%
		Peak HB19-22	86.89%	85.77%	70.78%	71.48%
		Weekend	89.78%	89.77%	73.45%	73.78%
		Night	85.21%	85.37%	75.24%	75.15%
		All Winter	87.39%	87.20%	73.58%	73.29%
Shoulder	Zone	A-F	87.60%	87.53%	75.52%	75.83%
		GHI	91.35%	91.41%	73.11%	73.81%
		J	92.19%	92.34%	76.25%	76.62%
		K	91.89%	92.22%	73.73%	74.15%
	Hour Group	Peak HB07-10	91.31%	91.27%	72.91%	72.98%
		Peak HB11-14	91.18%	90.92%	71.92%	71.74%
		Peak HB15-18	92.86%	93.09%	74.02%	74.78%
		Peak HB19-22	91.40%	91.33%	72.06%	72.96%
		Weekend	92.63%	92.68%	71.19%	71.74%
		Night	83.32%	83.46%	81.49%	81.83%
		All Shoulder	89.60%	89.64%	74.74%	75.17%

Coverage
100-95%
90-95%
85-90%
80-85%
75-80%
70-75%
65-70%
60-65%
55-60%
50-55%
Below 50%

Table D-2
Alternative Hourly Groupings
Summary of Coverage of Payments Due May 2007 - December 2021

			Virtual Demand		Virtual Supply	
			1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Summer	Zone	A-F	83.87%	83.45%	76.70%	76.86%
		GHI	92.57%	93.26%	71.08%	72.67%
		J	93.59%	94.10%	73.84%	75.99%
		K	89.97%	89.84%	73.94%	74.66%
	Hour Group	Peak HB07-09	87.31%	87.49%	74.48%	74.87%
		Peak HB10-11	91.30%	91.67%	66.76%	66.33%
		Peak HB12-13	89.92%	90.28%	65.73%	66.21%
		Peak HB14-17	89.75%	89.57%	68.60%	71.23%
		Peak HB18-20	89.81%	89.90%	73.92%	74.06%
		Peak HB21-22	88.59%	87.97%	79.88%	79.35%
		Night HB23,00	83.53%	82.95%	87.62%	87.33%
		Other Night	84.18%	83.98%	89.81%	89.12%
		Weekend HB13-19	87.71%	87.93%	66.25%	67.58%
		Other Weekend	88.15%	88.68%	77.31%	78.39%
		All Summer	88.01%	88.02%	74.40%	75.26%
Winter	Zone	A-F	85.85%	85.81%	73.44%	72.58%
		GHI	88.18%	87.82%	73.70%	73.45%
		J	88.93%	88.65%	75.19%	74.38%
		K	91.31%	91.13%	76.06%	76.56%
	Hour Group	Peak HB07-09	87.90%	87.74%	69.08%	67.24%
		Peak HB10-12	88.18%	87.97%	68.79%	66.91%
		Peak HB13-15	85.09%	86.03%	75.84%	75.19%
		Peak HB16-17	88.55%	87.99%	79.12%	79.25%
		Peak HB18-20	88.75%	87.95%	75.85%	74.92%
		Peak HB21-22	85.01%	83.49%	70.58%	71.90%
		Night HB02-04	86.82%	86.98%	78.17%	77.24%
		Other Night	84.91%	85.11%	74.22%	74.36%
		Weekend HB16-20	91.07%	90.67%	75.09%	75.60%
		Other Weekend	89.37%	89.54%	73.07%	72.58%
		All Winter	87.49%	87.32%	74.04%	73.53%
Shoulder	Zone	A-F	87.57%	87.47%	76.20%	76.44%
		GHI	91.34%	91.38%	73.77%	74.35%
		J	92.25%	92.40%	76.86%	77.14%
		K	91.92%	92.23%	74.31%	74.31%
	Hour Group	Peak HB07-10	91.31%	91.27%	72.91%	72.98%
		Peak HB11-14	91.18%	90.92%	71.92%	71.74%
		Peak HB15-19	93.08%	93.25%	73.40%	74.27%
		Peak HB20-22	90.14%	89.84%	74.90%	75.24%
		Night HB23,00,06	87.14%	87.27%	77.47%	77.71%
		Other Night	80.69%	80.70%	85.36%	85.56%
		Weekend HB17-20	93.14%	93.55%	71.78%	73.01%
		Other Weekend	92.35%	92.35%	73.12%	72.77%
		All Shoulder	89.60%	89.61%	75.39%	75.69%

Coverage
100-95%
90-95%
85-90%
80-85%
75-80%
70-75%
65-70%
60-65%
55-60%
50-55%
Below 50%

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Look Back Period Analysis (continued)

- **Table D-1 shows aggregate coverage results for the current hourly groupings for one- and two-year look back periods, while Table D-2 shows aggregate coverage results for the alternative hourly groupings for the same periods.**
  - Both tables show coverage based on a 97th percentile threshold for virtual demand and supply.

- **Coverage of Virtual Demand and Virtual Supply:**
  - Tables D-1 and D-2 show a significant difference between the coverage of virtual demand and virtual supply positions, with coverage of virtual demand positions averaging in the 85-95% range and virtual supply positions averaging in the 70-80% range.
    - The coverage level is sometimes materially lower than the average for particular hours within the hourly groupings.

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Look Back Period Analysis (continued)

Table E-1
Current Hourly Groupings
Summary of Coverage of Payments Due May 2010 - December 2021

			Virtual Demand			Virtual Supply		
			1-Year Lookback	2-Year Lookback	5-Year Lookback	1-Year Lookback	2-Year Lookback	5-Year Lookback
Summer	Zone	Zone A-F	87.97%	89.17%	90.82%	72.16%	72.67%	73.87%
		Zone GHI	92.49%	93.91%	95.87%	66.46%	67.72%	70.63%
		Zone J	93.59%	94.82%	96.42%	68.96%	70.36%	72.63%
		Zone K	88.11%	87.91%	88.47%	71.76%	71.98%	73.78%
	Hour Group	Peak HB07-10	88.07%	88.96%	90.24%	65.05%	66.11%	68.16%
		Peak HB11-14	91.66%	92.03%	93.44%	64.19%	63.78%	63.73%
		Peak HB15-18	92.41%	93.14%	94.28%	66.12%	67.04%	69.88%
		Peak HB19-22	90.73%	91.57%	92.90%	75.13%	75.64%	78.90%
		Weekend	89.30%	90.69%	92.47%	64.69%	66.06%	68.02%
		Night	85.62%	87.44%	89.61%	89.16%	90.32%	92.11%
		All Summer	89.72%	90.76%	92.31%	70.23%	70.98%	72.85%
Winter	Zone	Zone A-F	84.21%	83.70%	85.25%	70.71%	69.23%	71.22%
		Zone GHI	86.90%	85.80%	86.58%	71.45%	70.46%	73.16%
		Zone J	87.50%	86.50%	87.45%	71.97%	70.79%	72.51%
		Zone K	91.17%	90.38%	90.94%	74.62%	75.36%	75.98%
	Hour Group	Peak HB07-10	86.97%	86.11%	86.95%	64.52%	62.34%	62.77%
		Peak HB11-14	84.14%	84.40%	85.00%	74.17%	71.53%	71.91%
		Peak HB15-18	86.76%	85.75%	87.20%	75.78%	74.97%	75.28%
		Peak HB19-22	84.67%	83.00%	83.60%	68.08%	68.08%	69.85%
		Weekend	89.18%	88.25%	89.61%	70.11%	69.87%	74.46%
		Night	84.84%	84.53%	86.00%	74.70%	73.79%	76.38%
		All Winter	86.20%	85.44%	86.58%	71.57%	70.55%	72.52%
Shoulder	Zone	Zone A-F	87.95%	87.99%	89.14%	74.18%	74.34%	75.66%
		Zone GHI	91.68%	91.72%	93.12%	71.42%	71.74%	74.15%
		Zone J	92.31%	92.39%	93.91%	73.50%	73.75%	76.32%
		Zone K	91.99%	92.39%	93.32%	72.23%	72.39%	72.84%
	Hour Group	Peak HB07-10	90.60%	90.55%	91.43%	71.91%	71.53%	71.36%
		Peak HB11-14	90.61%	90.49%	91.34%	67.98%	67.65%	68.88%
		Peak HB15-18	92.06%	92.29%	93.08%	74.63%	74.75%	76.50%
		Peak HB19-22	90.33%	90.46%	91.12%	74.55%	75.49%	77.20%
		Weekend	91.65%	91.49%	92.96%	68.32%	69.06%	71.65%
		Night	86.13%	86.50%	88.53%	78.63%	78.79%	80.65%
		All Shoulder	89.90%	90.00%	91.22%	73.16%	73.37%	74.94%

Table E-2
Alternative Hourly Groupings
Summary of Coverage of Payments Due May 2010 - December 2021

			Virtual Demand			Virtual Supply		
			1-Year Lookback	2-Year Lookback	5-Year Lookback	1-Year Lookback	2-Year Lookback	5-Year Lookback
Summer	Zone	A-F	88.10%	89.23%	90.97%	73.22%	74.01%	74.96%
		GHI	92.54%	94.04%	95.93%	68.36%	70.22%	73.59%
		J	93.68%	94.94%	96.48%	70.89%	73.00%	75.48%
		K	88.56%	88.44%	88.81%	72.83%	72.86%	74.84%
	Hour Group	Peak HB07-09	86.28%	87.25%	88.55%	73.55%	74.44%	76.58%
		Peak HB10-11	92.41%	93.19%	94.31%	62.08%	60.38%	60.53%
		Peak HB12-13	91.55%	92.14%	93.42%	64.23%	64.71%	64.29%
		Peak HB14-17	92.54%	93.09%	94.32%	66.81%	68.85%	72.03%
		Peak HB18-20	91.26%	91.79%	92.95%	73.64%	73.33%	76.09%
		Peak HB21-22	91.00%	92.07%	93.86%	76.86%	76.64%	79.58%
		Night HB23,00	85.01%	86.90%	89.26%	85.57%	86.40%	88.26%
		Other Night	85.81%	87.60%	89.74%	90.91%	92.17%	93.95%
		Weekend HB13-19	90.13%	91.05%	92.38%	63.31%	64.86%	65.93%
		Other Weekend	89.22%	91.20%	93.44%	74.00%	76.03%	77.86%
		All Summer	89.87%	90.91%	92.46%	71.60%	72.69%	74.62%
Winter	Zone	A-F	84.39%	83.92%	85.31%	71.23%	69.56%	71.28%
		GHI	86.90%	85.83%	86.55%	71.71%	70.41%	73.32%
		J	87.60%	86.85%	87.66%	72.59%	70.75%	72.52%
		K	91.50%	90.59%	91.07%	75.31%	75.41%	76.42%
	Hour Group	Peak HB07-09	86.80%	86.15%	87.13%	67.52%	64.62%	64.59%
		Peak HB10-12	86.30%	85.62%	86.22%	67.26%	64.15%	64.94%
		Peak HB13-15	83.47%	84.02%	84.39%	74.04%	72.86%	72.85%
		Peak HB16-17	86.74%	85.61%	87.24%	76.91%	76.96%	77.44%
		Peak HB18-20	86.52%	85.35%	85.96%	73.15%	70.98%	71.38%
		Peak HB21-22	83.06%	80.88%	81.30%	68.90%	69.24%	71.30%
		Night HB02-04	85.38%	85.09%	86.03%	79.29%	77.42%	79.84%
		Other Night	84.93%	84.85%	86.30%	72.81%	72.09%	74.69%
		Weekend HB16-20	91.07%	89.31%	90.82%	70.74%	71.33%	77.86%
		Other Weekend	88.65%	88.13%	89.28%	69.59%	68.37%	72.46%
		All Winter	86.34%	85.62%	86.63%	72.05%	70.70%	72.65%
Shoulder	Zone	A-F	87.94%	87.93%	89.12%	74.91%	74.98%	76.44%
		GHI	91.62%	91.65%	93.10%	72.04%	72.38%	74.72%
		J	92.34%	92.43%	93.90%	74.21%	74.46%	76.94%
		K	92.09%	92.42%	93.35%	72.84%	72.47%	73.30%
	Hour Group	Peak HB07-10	90.60%	90.55%	91.43%	71.91%	71.53%	71.36%
		Peak HB11-14	90.61%	90.49%	91.34%	67.98%	67.65%	68.88%
		Peak HB15-19	92.14%	92.35%	93.04%	74.97%	75.25%	77.16%
		Peak HB20-22	89.26%	89.16%	90.04%	75.35%	75.74%	77.52%
		Night HB23,00,06	90.13%	90.38%	92.39%	73.41%	73.83%	76.22%
		Other Night	83.30%	83.57%	85.70%	83.67%	83.65%	85.18%
		Weekend HB17-20	91.49%	91.80%	93.19%	69.99%	70.91%	73.50%
		Other Weekend	91.60%	91.34%	92.88%	70.29%	70.27%	73.35%
		All Shoulder	89.90%	89.96%	91.21%	73.84%	73.93%	75.61%

New York ISO

Look Back Period Analysis (continued)

- **Tables E-1 and E-2 present similar coverage calculations, but in these tables the coverage results are reported for the period May 2010 through December 2021, for a one-year, two-year, and five-year look back period.**
  - Both tables show coverage based on a 97th percentile threshold for virtual demand and supply.

- **Coverage of Virtual Demand and Virtual Supply:**
  - The divergence between virtual demand and supply coverage has widened noticeably with the exclusion of the first three years of data from the one-year and two-year look back analyses. This widening difference appears to reflect declining coverage of virtual supply positions.

New York ISO

Look Back Period Analysis (continued)

- **Virtual Supply Positions**
  - As expected, the credit requirements and coverage for the weighted credit requirements generally fall between those for the one- and five-year look back periods.
  - In Table 1, the final rows of the section for each season compare each alternative look back to the one-year look back period, based on a 97th percentile threshold.

New York ISO

Look Back Period Analysis (continued)

Table 1 – Virtual Supply
Summary of Collateral, Payments Due, and Uncovered Payments May 2010-December 2021
Current Hourly Grouping with Individual Zone Collateral

Current Hourly Groupings			1-Year Lookback	2-Year Lookback	5-Year Lookback	Current Design	Lookback Alt. 1	Lookback Alt. 2	Lookback Alt. 3
	Summer	Collateral	$ 15,684,600	$ 15,664,264	$ 17,676,354	$ 18,501,465	$ 16,348,518	$ 16,680,477	$ 17,012,436
		Payments Due	$ 2,120,165	$ 2,120,165	$ 2,120,165	$ 2,120,165	$ 2,120,165	$ 2,120,165	$ 2,120,165
		Uncovered Payments	$ 607,428	$ 596,037	$ 558,282	$ 560,773	$ 578,382	$ 569,769	$ 563,590
		Ratio Collateral/Payments Due	7.4	7.4	8.3	8.7	7.7	7.9	8.0
		Coverage Percentage	71.3%	71.9%	73.7%	73.6%	72.7%	73.1%	73.4%
						Compared to 1-Year Lookback, change in Collateral:	*4.2%*	*6.3%*	*8.5%*
						Uncovered Payments:	*-4.8%*	*-6.2%*	*-7.2%*
	Winter	Collateral	$ 15,997,038	$ 15,930,476	$ 15,684,981	$ 16,699,957	$ 15,893,019	$ 15,841,010	$ 15,789,000
		Payments Due	$ 1,892,158	$ 1,892,158	$ 1,892,158	$ 1,892,158	$ 1,892,158	$ 1,892,158	$ 1,892,158
		Uncovered Payments	$ 528,018	$ 550,776	$ 515,324	$ 489,243	$ 507,328	$ 504,084	$ 504,556
		Ratio Collateral/Payments Due	8.5	8.4	8.3	8.8	8.4	8.4	8.3
		Coverage Percentage	72.1%	70.9%	72.8%	74.1%	73.2%	73.4%	73.3%
						Compared to 1-Year Lookback, change in Collateral:	*-0.7%*	*-1.0%*	*-1.3%*
						Uncovered Payments:	*-3.9%*	*-4.5%*	*-4.4%*
	Shoulder	Collateral	$ 16,068,609	$ 15,913,851	$ 17,263,808	$ 18,637,944	$ 16,467,009	$ 16,666,209	$ 16,865,409
		Payments Due	$ 2,187,397	$ 2,187,397	$ 2,187,397	$ 2,187,397	$ 2,187,397	$ 2,187,397	$ 2,187,397
		Uncovered Payments	$ 575,790	$ 573,380	$ 540,714	$ 502,255	$ 555,188	$ 548,696	$ 544,198
		Ratio Collateral/Payments Due	7.3	7.3	7.9	8.5	7.5	7.6	7.7
		Coverage Percentage	73.7%	73.8%	75.3%	77.0%	74.6%	74.9%	75.1%
						Compared to 1-Year Lookback, change in Collateral:	*2.5%*	*3.7%*	*5.0%*
						Uncovered Payments:	*-3.6%*	*-4.7%*	*-5.5%*
	Total	Collateral	$ 47,750,247	$ 47,508,590	$ 50,625,144	$ 53,839,366	$ 48,708,546	$ 49,187,696	$ 49,666,845
		Payments Due	$ 6,199,720	$ 6,199,720	$ 6,199,720	$ 6,199,720	$ 6,199,720	$ 6,199,720	$ 6,199,720
		Uncovered Payments	$ 1,711,236	$ 1,720,193	$ 1,614,320	$ 1,552,271	$ 1,640,899	$ 1,622,549	$ 1,612,344
		Ratio Collateral/Payments Due	7.7	7.7	8.2	8.7	7.9	7.9	8.0
		Coverage Percentage	72.4%	72.3%	74.0%	75.0%	73.5%	73.8%	74.0%
						Compared to 1-Year Lookback, change in Collateral:	*2.0%*	*3.0%*	*4.0%*
						Uncovered Payments:	*-4.1%*	*-5.2%*	*-5.8%*

New York ISO

Look Back Period Analysis (continued)

- **Virtual Supply Positions – Summer Analysis**
  - The three weighted alternatives decrease uncovered payments in the summer relative to the one-year look back period, sometimes by slightly less, sometimes by slightly more than the increase in credit support.
    - Alternative 1 increases credit support by 4.2%, while uncovered payments decrease by 4.8%.
    - Alternative 2 increases credit support by 6.3%, while uncovered payments decrease by 6.2%.
    - Alternative 3 increases credit support by 8.5%, while uncovered payments decrease by 7.2%.
  - Relative to the current design:
    - Alternative 1 reduces credit support by 12%, while uncovered payments increase by 4.7%.
    - Alternative 2 reduces credit support by 9.8%, while uncovered payments increase by 1.6%.
    - Alternative 3 reduces credit support by 8%, while uncovered payments increase by only .5%.

New York ISO

Look Back Period Analysis (continued)

- **Virtual Supply Positions – Winter Analysis**
  - The three weighted alternatives decrease both credit requirements and uncovered payments in the winter relative to the one-year look back period.
    - Alternative 1 decreases credit support by .7%, while uncovered payments decrease by 3.9%.
    - Alternative 2 decreases credit support by 1.0%, while uncovered payments decrease by 4.5%.
    - Alternative 3 decreases credit support by 1.3%, while uncovered payments decrease by 4.4%.
  - Relative to the current design:
    - Alternative 1 reduces credit support by 4.8%, while uncovered payments increase by 3.7%.
    - Alternative 2 reduces credit support by 5.1%, while uncovered payments increase by 3%.
    - Alternative 3 reduces credit support by 5.5%, while uncovered payments increase by 3%.

New York ISO

Look Back Period Analysis (continued)

- **Virtual Supply Positions – Shoulder Analysis**
  - Similar to summer months, the three weighted alternatives increase credit requirements and reduce uncovered payments in the shoulder months relative to the one-year look back period.
    - Alternative 1 increases credit support by 2.5%, while uncovered payments decrease by 3.6%.
    - Alternative 2 increases credit support by 3.7%, while uncovered payments decrease by 4.7%.
    - Alternative 3 increases credit support by 5.0%, while uncovered payments decrease by 5.5%.
  - Relative to the current design:
    - Alternative 1 reduces credit support by 11.6%, while uncovered payments increase by 10.5%.
    - Alternative 2 reduces credit support by 10.6%, while uncovered payments increase by 9.2%.
    - Alternative 3 reduces credit support by 9.5%, while uncovered payments increase by 8.4%.

New York ISO

Look Back Period Analysis (continued)

- **Virtual Demand Positions**
  - As expected, the credit requirements and coverage for the weighted credit requirements generally fall between those for the one and five-year look back periods.
  - The designs show much higher coverage levels than for virtual supply positions, exceeding 90% in the summer and shoulder months and exceeding 85% in the winter months.

New York ISO

Look Back Period Analysis (continued)

Table 4 – Virtual Demand
Summary of Collateral, Payments Due, and Uncovered Payments May 2010-December 2021
Current Hourly Grouping with Individual Zone Collateral

Current Hourly Groupings			1-Year Lookback	2-Year Lookback	5-Year Lookback	Current Design	Lookback Alt. 1	Lookback Alt. 2	Lookback Alt. 3
	Summer	Collateral	$ 10,042,340	$ 11,025,796	$ 12,651,958	$ 13,587,907	$ 10,912,213	$ 11,347,149	$ 11,782,085
		Payments Due	$ 2,202,354	$ 2,202,354	$ 2,202,354	$ 2,202,354	$ 2,202,354	$ 2,202,354	$ 2,202,354
		Uncovered Payments	$ 217,922	$ 196,803	$ 163,526	$ 161,443	$ 186,483	$ 177,192	$ 170,680
		Ratio Collateral/Payments Due	4.6	5.0	5.7	6.2	5.0	5.2	5.3
		Coverage Percentage	90.1%	91.1%	92.6%	92.7%	91.5%	92.0%	92.3%
		Compared to 1-Year Lookback, change in Collateral:					*8.7%*	*13.0%*	*17.3%*
		Uncovered Payments:					*-14.4%*	*-18.7%*	*-21.7%*
	Winter	Collateral	$ 12,293,698	$ 12,623,623	$ 11,813,610	$ 13,017,931	$ 12,133,669	$ 12,053,654	$ 11,973,640
		Payments Due	$ 2,323,367	$ 2,323,367	$ 2,323,367	$ 2,323,367	$ 2,323,367	$ 2,323,367	$ 2,323,367
		Uncovered Payments	$ 318,165	$ 335,185	$ 311,110	$ 282,853	$ 300,613	$ 297,788	$ 298,140
		Ratio Collateral/Payments Due	5.3	5.4	5.1	5.6	5.2	5.2	5.2
		Coverage Percentage	86.3%	85.6%	86.6%	87.8%	87.1%	87.2%	87.2%
		Compared to 1-Year Lookback, change in Collateral:					*-1.3%*	*-2.0%*	*-2.6%*
		Uncovered Payments:					*-5.5%*	*-6.4%*	*-6.3%*
	Shoulder	Collateral	$ 9,968,678	$ 10,113,275	$ 11,313,705	$ 13,443,714	$ 10,417,020	$ 10,641,191	$ 10,865,363
		Payments Due	$ 2,228,372	$ 2,228,372	$ 2,228,372	$ 2,228,372	$ 2,228,372	$ 2,228,372	$ 2,228,372
		Uncovered Payments	$ 222,107	$ 220,815	$ 192,947	$ 149,820	$ 201,692	$ 196,066	$ 192,637
		Ratio Collateral/Payments Due	4.5	4.5	5.1	6.0	4.7	4.8	4.9
		Coverage Percentage	90.0%	90.1%	91.3%	93.3%	90.9%	91.2%	91.4%
		Compared to 1-Year Lookback, change in Collateral:					*4.5%*	*6.7%*	*9.0%*
		Uncovered Payments:					*-9.2%*	*-11.7%*	*-13.3%*
	Total	Collateral	$ 32,304,716	$ 33,762,694	$ 35,779,273	$ 40,049,552	$ 33,462,902	$ 34,041,995	$ 34,621,088
		Payments Due	$ 6,754,093	$ 6,754,093	$ 6,754,093	$ 6,754,093	$ 6,754,093	$ 6,754,093	$ 6,754,093
		Uncovered Payments	$ 758,194	$ 752,802	$ 667,584	$ 594,117	$ 688,788	$ 671,046	$ 661,457
		Ratio Collateral/Payments Due	4.8	5.0	5.3	5.9	5.0	5.0	5.1
		Coverage Percentage	88.8%	88.9%	90.1%	91.2%	89.8%	90.1%	90.2%
		Compared to 1-Year Lookback, change in Collateral:					*3.6%*	*5.4%*	*7.2%*
		Uncovered Payments:					*-9.2%*	*-11.5%*	*-12.8%*

New York ISO

Look Back Period Analysis (continued)

- **Virtual Demand Positions – Summer Analysis**
  - The three weighted alternatives increase credit requirements and reduce uncovered payments in the summer months.
    - Alternative 1 increases credit support by 8.7%, while uncovered payments decrease by 14.4%.
    - Alternative 2 increases credit support by 13.0%, while uncovered payments decrease by 18.7%.
    - Alternative 3 increases credit support by 17.3%, while uncovered payments decrease by 21.7%.
  - Relative to the current design:
    - Alternative 1 reduces credit support by 21.3%, while uncovered payments increase by 15.5%.
    - Alternative 2 reduces credit support by 18.1%, while uncovered payments increase by 9.8%.
    - Alternative 3 reduces credit support by 15.0%, while uncovered payments increase by 5.7%
  - Although uncovered payments due increase relative to the current design, coverage is still extremely high at 92.3%.

New York ISO

Look Back Period Analysis (continued)

- **Virtual Demand Positions – Winter Analysis**
  - The three weighted alternatives decrease both credit requirements and uncovered payments in the winter relative to the one-year look back period.
    - Alternative 1 decreases credit support by 1.3%, while uncovered payments decrease by 5.5%.
    - Alternative 2 decreases credit support by 2.0%, while uncovered payments decrease by 6.4%.
    - Alternative 3 decreases credit support by 2.6%, while uncovered payments decrease by 6.3%.
  - Relative to the current design:
    - Alternative 1 reduces credit support by 6.8%, while uncovered payments increase by 6.3%.
    - Alternative 2 reduces credit support by 7.4%, while uncovered payments increase by 5.3%.
    - Alternative 3 reduces credit support by 8.0%, while uncovered payments increase by 5.4%.

New York ISO

Look Back Period Analysis (continued)

- **Virtual Demand Positions – Shoulder Analysis**
  - Similar to summer months, the three weighted alternatives increase credit requirements and reduce uncovered payments in the shoulder months relative to the one-year look back period.
    - Alternative 1 increases credit support by 4.5%, while uncovered payments decrease by 9.2%.
    - Alternative 2 increases credit support by 6.7%, while uncovered payments decrease by 11.7%.
    - Alternative 3 increases credit support by 9.0%, while uncovered payments decrease by 13.3%.
  - Relative to the current design:
    - Alternative 1 reduces credit support by 22.5%, while uncovered payments increase by 34.6%.
    - Alternative 2 reduces credit support by 20.8%, while uncovered payments increase by 30.1%.
    - Alternative 3 reduces credit support by 19.2%, while uncovered payments increase by 28.6%
  - Although uncovered payments due increase relative to the current design, coverage is still extremely high at 91.4%.

New York ISO

Zonal Grouping Analysis (continued)

Table H-1
Virtual Demand
Summary of Coverage of Payments Due May 2007 - December 2021

		Current Hourly Grouping		Alternative Hourly Grouping	
		1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Summer	Joint Zone A	83.00%	83.11%	83.61%	83.48%
	Individual Zone A	86.32%	85.95%	86.79%	86.30%
	Joint Zone B	86.14%	85.93%	86.46%	85.99%
	Individual Zone B	85.17%	84.91%	85.75%	85.05%
	Joint Zone C	85.94%	85.75%	86.30%	85.84%
	Individual Zone C	85.25%	85.05%	85.90%	85.20%
	Joint Zone D	73.53%	73.19%	73.85%	73.29%
	Individual Zone D	74.95%	73.90%	75.68%	74.04%
	Joint Zone E	85.68%	85.47%	86.00%	85.51%
	Individual Zone E	85.23%	85.04%	85.79%	85.14%
	Joint Zone F	87.60%	87.40%	87.87%	87.43%
	Individual Zone F	87.87%	87.85%	88.32%	87.97%
	Joint Zone G	92.79%	93.42%	92.73%	93.41%
	Individual Zone G	92.43%	92.97%	92.51%	93.10%
	Joint Zone H	92.32%	93.01%	92.36%	93.10%
	Individual Zone H	92.68%	93.32%	92.77%	93.42%
	Joint Zone I	92.61%	93.21%	92.64%	93.28%
	Individual Zone I	92.86%	93.45%	92.96%	93.52%

Table H-2
Virtual Supply
Summary of Coverage of Payments Due May 2007 - December 2021

		Current Hourly Grouping		Alternative Hourly Grouping	
		1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Summer	Joint Zone A	65.27%	65.24%	66.08%	66.61%
	Individual Zone A	73.27%	72.81%	74.65%	74.49%
	Joint Zone B	79.69%	79.50%	80.52%	80.42%
	Individual Zone B	78.13%	78.11%	79.09%	79.08%
	Joint Zone C	79.13%	79.17%	79.99%	80.17%
	Individual Zone C	78.40%	78.41%	79.53%	79.62%
	Joint Zone D	81.96%	82.03%	82.54%	82.67%
	Individual Zone D	81.64%	81.49%	82.28%	82.06%
	Joint Zone E	78.82%	78.95%	79.66%	79.87%
	Individual Zone E	78.46%	78.46%	79.36%	79.54%
	Joint Zone F	73.49%	73.33%	74.36%	74.26%
	Individual Zone F	75.24%	75.01%	76.01%	76.09%
	Joint Zone G	70.94%	71.81%	73.14%	74.59%
	Individual Zone G	70.02%	70.75%	72.37%	73.68%
	Joint Zone H	67.95%	68.82%	70.21%	71.73%
	Individual Zone H	68.92%	69.46%	71.16%	72.45%
	Joint Zone I	67.70%	68.78%	70.05%	71.84%
	Individual Zone I	68.98%	69.94%	71.71%	73.34%

New York ISO

Zonal Grouping Analysis (continued)

- **Results of Summer Analysis:**
  - In virtual supply for the summer analysis, most zones have small changes in coverage up and down shifting from grouped to individual credit requirement calculations, with the comparison based on a 97th percentile threshold.
  - A notable exception is in Zone A, where there is a significant increase in coverage going from the grouped zonal credit requirement to the individual zonal requirement.
    - For the one-year look back in Zone A, coverage increases from 65.27% for joint to 73.27% for individual.
    - Similarly, the two-year look back increases from 65.24% coverage for joint to 72.81% for individual in Zone A. The increase was due to the shut-down of coal generation that caused Zone A congestion to increase and differ from that of the other western zones.

New York ISO

Zonal Grouping Analysis (continued)

Table H-1
Virtual Demand
Summary of Coverage of Payments Due May 2007 - December 2021

		Current Hourly Grouping		Alternative Hourly Grouping	
		1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Winter	Joint Zone A	88.48%	88.39%	88.64%	88.51%
	Individual Zone A	85.58%	85.66%	85.92%	85.76%
	Joint Zone B	86.97%	87.14%	87.22%	87.34%
	Individual Zone B	84.87%	85.18%	85.05%	85.31%
	Joint Zone C	87.31%	87.28%	87.50%	87.45%
	Individual Zone C	85.32%	85.43%	85.40%	85.45%
	Joint Zone D	83.43%	83.76%	83.59%	83.86%
	Individual Zone D	83.97%	84.12%	84.17%	84.12%
	Joint Zone E	86.27%	86.30%	86.46%	86.48%
	Individual Zone E	85.01%	85.16%	85.15%	85.13%
	Joint Zone F	83.10%	82.62%	83.12%	82.78%
	Individual Zone F	88.76%	88.50%	88.85%	88.49%
	Joint Zone G	88.38%	87.97%	88.31%	87.97%
	Individual Zone G	88.45%	87.90%	88.45%	88.05%
	Joint Zone H	88.05%	87.62%	88.00%	87.62%
	Individual Zone H	88.37%	87.79%	88.42%	87.93%
	Joint Zone I	88.29%	87.89%	88.24%	87.89%
	Individual Zone I	88.57%	88.04%	88.67%	88.19%

Table H-2
Virtual Supply
Summary of Coverage of Payments Due May 2007 - December 2021

		Current Hourly Grouping		Alternative Hourly Grouping	
		1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Winter	Joint Zone A	74.35%	73.71%	75.23%	74.25%
	Individual Zone A	72.60%	71.55%	73.75%	72.08%
	Joint Zone B	75.02%	74.05%	75.52%	74.48%
	Individual Zone B	73.00%	71.62%	73.70%	72.22%
	Joint Zone C	74.54%	73.55%	74.98%	73.99%
	Individual Zone C	73.35%	72.24%	74.06%	72.91%
	Joint Zone D	75.87%	75.19%	76.24%	75.47%
	Individual Zone D	75.19%	74.08%	75.64%	74.82%
	Joint Zone E	73.41%	72.50%	73.89%	72.96%
	Individual Zone E	73.11%	71.89%	73.82%	72.63%
	Joint Zone F	67.05%	66.45%	67.00%	66.41%
	Individual Zone F	75.14%	74.86%	75.04%	75.06%
	Joint Zone G	73.47%	73.46%	73.79%	73.54%
	Individual Zone G	73.90%	73.61%	74.42%	73.94%
	Joint Zone H	73.26%	73.26%	73.59%	73.34%
	Individual Zone H	73.85%	73.61%	74.44%	73.95%
	Joint Zone I	73.37%	73.39%	73.72%	73.46%
	Individual Zone I	73.82%	73.51%	74.38%	73.92%

New York ISO

Zonal Grouping Analysis (continued)

- **Results of Winter Analysis:**
  - In the winter analysis, most zones have small changes in coverage up and down shifting from grouped to individual credit requirement calculations with the comparison based on a 97th percentile threshold.

  - The notable exception was in Zone F where there is a significant increase in coverage going from the grouped zonal credit requirement to the individual zonal requirement.
    - For the one-year look back in Zone F, coverage increases from 67.05% for joint to 75.14% for individual.
    - Similarly, the two-year look back increases from 66.45% coverage for joint to 74.86% for individual. This increase is likely due to increased exports to ISO New England in real-time on cold days during the winter months, which cause Central East to bind in real-time, causing Zone F prices to rise relative to prices in the west.

New York ISO

Zonal Grouping Analysis (continued)

Table H-1
Virtual Demand
Summary of Coverage of Payments Due May 2007 - December 2021

		Current Hourly Grouping		Alternative Hourly Grouping	
		1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Shoulder	Joint Zone A	89.40%	89.61%	89.41%	89.58%
	Individual Zone A	89.66%	89.71%	89.77%	89.68%
	Joint Zone B	90.21%	90.08%	90.18%	90.02%
	Individual Zone B	89.27%	89.11%	89.26%	89.06%
	Joint Zone C	90.21%	90.10%	90.19%	90.05%
	Individual Zone C	89.43%	89.26%	89.44%	89.23%
	Joint Zone D	77.39%	77.30%	77.28%	77.18%
	Individual Zone D	79.14%	79.08%	79.08%	79.05%
	Joint Zone E	89.37%	89.24%	89.34%	89.18%
	Individual Zone E	88.83%	88.68%	88.87%	88.64%
	Joint Zone F	89.79%	89.60%	89.81%	89.59%
	Individual Zone F	90.69%	90.52%	90.66%	90.50%
	Joint Zone G	91.30%	91.39%	91.30%	91.37%
	Individual Zone G	91.22%	91.23%	91.21%	91.23%
	Joint Zone H	91.33%	91.38%	91.32%	91.34%
	Individual Zone H	91.48%	91.51%	91.50%	91.48%
	Joint Zone I	91.41%	91.47%	91.39%	91.43%
	Individual Zone I	91.55%	91.60%	91.57%	91.56%

Table H-2
Virtual Supply
Summary of Coverage of Payments Due May 2007 - December 2021

		Current Hourly Grouping		Alternative Hourly Grouping	
		1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Shoulder	Joint Zone A	68.46%	68.55%	69.08%	69.15%
	Individual Zone A	72.92%	72.53%	73.91%	73.53%
	Joint Zone B	77.82%	78.17%	78.56%	78.87%
	Individual Zone B	76.07%	76.61%	76.94%	77.33%
	Joint Zone C	77.39%	77.73%	78.13%	78.41%
	Individual Zone C	76.16%	76.63%	76.93%	77.33%
	Joint Zone D	81.26%	81.64%	81.86%	82.20%
	Individual Zone D	80.88%	81.02%	81.55%	81.64%
	Joint Zone E	77.26%	77.64%	77.98%	78.29%
	Individual Zone E	76.28%	76.80%	77.06%	77.46%
	Joint Zone F	72.19%	72.53%	72.82%	73.03%
	Individual Zone F	75.32%	75.44%	75.92%	75.79%
	Joint Zone G	73.95%	74.66%	74.61%	75.20%
	Individual Zone G	73.96%	74.53%	74.67%	75.14%
	Joint Zone H	72.84%	73.50%	73.48%	74.04%
	Individual Zone H	73.25%	73.77%	73.97%	74.30%
	Joint Zone I	72.57%	73.27%	73.23%	73.82%
	Individual Zone I	73.07%	73.63%	73.79%	74.15%

New York ISO

Zonal Grouping Analysis (continued)

- **Results of Shoulder Analysis:**
  - Although the changes in coverage are not as dramatic for the shoulder seasons, coverage of virtual supply positions under current hourly groupings in Zone A improves significantly with a credit requirement calculated from Zone A data, with the comparison based on a 97th percentile threshold.

  - These improvements in coverage that result from an individual zone credit requirement estimation method bring the coverage percentages for Zones A and F more in line with the coverage in other zones.

New York ISO

Portfolio Analysis (continued)

Table 4N
1-Day Virtual Supply Sub-Portfolio Balancing
May 1, 2010 - December 31, 2021
Alternative Hourly Grouping, Individual Zone Collateral

Portfolio	Percentile Collateral	Lookback Duration	Percent Portfolios Uncovered	Percent Payments Due Uncovered	Collateral ($Millions)	Average Daily Total Collateral ($Millions)	Payments Due ($Millions)	Uncovered Payments Due ($Millions)	Uncovered Payments Due per Year ($Millions)
Supply	97th	1 Year	1.30	9.74	9,057	2.125	723.74	70.49	6.04
		5 Year	0.97	9.18	9,431	2.212	723.74	66.47	5.69
		Alt 1	1.06	9.16	9,182	2.154	723.74	66.31	5.68
		Alt 2	1.01	9.04	9,244	2.168	723.74	65.39	5.60
		Alt 3	0.98	9.00	9,306	2.183	723.74	65.12	5.58
	98th	1 Year	0.78	6.49	12,346	2.896	723.74	46.95	4.02
		5 Year	0.58	6.12	12,520	2.937	723.74	44.31	3.79
		Alt 1	0.63	6.09	12,404	2.910	723.74	44.05	3.77
		Alt 2	0.59	5.98	12,433	2.916	723.74	43.31	3.71
		Alt 3	0.58	5.94	12,462	2.923	723.74	43.03	3.68
	Current		0.84	8.63	10,464	2.455	723.74	62.47	5.35

New York ISO

Portfolio Analysis (continued)

Table 6N
1-Day Portfolio Balancing
May 1, 2010 - December 31, 2021
Alternative Hourly Grouping, Individual Zone Collateral

Portfolio	Percentile Collateral	Lookback Duration	Percent Portfolios Uncovered	Percent Payments Due Uncovered	Collateral ($Millions)	Average Daily Total Collateral ($Millions)	Payments Due ($Millions)	Uncovered Payments Due ($Millions)	Uncovered Payments Due per Year ($Millions)
Supply + Demand	Aggregate (Supply - 98th) (Demand - 97th)	1 Year	0.77	3.67	16,190	3.798	897.28	32.91	2.82
		5 Year	0.51	3.37	16,799	3.941	897.28	30.20	2.59
		Alt 1	0.60	3.35	16,393	3.845	897.28	30.06	2.57
		Alt 2	0.56	3.26	16,495	3.869	897.28	29.29	2.51
		Alt 3	0.51	3.23	16,596	3.893	897.28	28.97	2.48
	Current		0.56	4.52	15,029	3.525	897.28	40.57	3.47

- From May 2010 through December 2021, total collateral at the portfolio level would have increased $1,566M, from $15,029M to $16,595M, or 10.4%, while uncovered payments due would decrease by $11.6M, from $40.57M to $28.97M, or 28.6%. The increase in collateral would have averaged a little less than $370,000 per day.

New York ISO

External Transactions (continued)

Table M-1
Summary of Coverage of Payments Due for Proxy Buses
Current Hourly Groupings

			Virtual Demand		Virtual Supply	
		Collateral Date Range	1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Summer	Proxy Bus: HQ Import Proxy (PTID 23651 until 7/1/2007 then 323601)	05/01/2007 - 12/31/2021	79.09%	79.00%	83.05%	83.37%
	HQ Wheel Proxy (PTID 23651)	05/01/2007 - 12/31/2021	77.90%	77.59%	81.84%	82.20%
	HQ Cedars Proxy (PTID 23651 until 10/1/2008 then 323590)	05/01/2007 - 12/31/2021	75.11%	73.92%	81.48%	81.43%
	NE Proxy (PTID 24062)	05/01/2007 - 12/31/2021	89.76%	90.18%	74.73%	75.23%
	NE CSC (PTID 323557)	08/01/2007 - 12/31/2021	87.22%	87.21%	71.24%	71.71%
	NE 1385 Proxy (PTID 323591)	08/01/2009 - 12/31/2021	78.06%	78.54%	72.74%	73.55%
	OH Proxy (PTID 24063)	05/01/2007 - 12/31/2021	81.03%	80.98%	80.64%	80.98%
	PJM Proxy (PTID 24065)	05/01/2007 - 12/31/2021	91.08%	91.42%	67.10%	67.22%
	PJM Neptune Proxy (PTID 323594)	07/01/2009 - 12/31/2021	87.22%	86.90%	68.44%	68.81%
	PJM VFT Proxy (PTID 23786 until 9/9/2009 then 323633)	05/01/2007 - 12/31/2021	87.05%	87.34%	72.60%	73.51%
	PJM HTP Proxy (PTID 323702)	06/01/2015 - 12/31/2021	95.03%	96.00%	71.33%	71.89%
		All Summer	83.81%	83.78%	74.52%	74.96%
Winter	Proxy Bus: HQ Import Proxy (PTID 23651 until 7/1/2007 then 323601)	05/01/2007 - 12/31/2021	85.56%	85.03%	74.06%	72.91%
	HQ Wheel Proxy (PTID 23651)	05/01/2007 - 12/31/2021	85.22%	84.77%	74.61%	73.42%
	HQ Cedars Proxy (PTID 23651 until 10/1/2008 then 323590)	05/01/2007 - 12/31/2021	83.45%	83.68%	73.31%	72.00%
	NE Proxy (PTID 24062)	05/01/2007 - 12/31/2021	88.60%	87.70%	78.52%	77.52%
	NE CSC (PTID 323557)	08/01/2007 - 12/31/2021	91.08%	91.13%	74.69%	76.14%
	NE 1385 Proxy (PTID 323591)	08/01/2009 - 12/31/2021	86.50%	87.07%	74.33%	75.39%
	OH Proxy (PTID 24063)	05/01/2007 - 12/31/2021	82.81%	83.20%	73.66%	72.67%
	PJM Proxy (PTID 24065)	05/01/2007 - 12/31/2021	87.48%	87.10%	69.76%	68.99%
	PJM Neptune Proxy (PTID 323594)	07/01/2009 - 12/31/2021	89.51%	89.69%	73.08%	73.71%
	PJM VFT Proxy (PTID 23786 until 9/9/2009 then 323633)	05/01/2007 - 12/31/2021	82.83%	82.26%	76.24%	75.20%
	PJM HTP Proxy (PTID 323702)	06/01/2015 - 12/31/2021	88.73%	89.60%	72.13%	73.55%
		All Winter	86.65%	86.55%	74.39%	74.15%
Shoulder	Proxy Bus: HQ Import Proxy (PTID 23651 until 7/1/2007 then 323601)	05/01/2007 - 12/31/2021	81.09%	81.06%	79.97%	80.10%
	HQ Wheel Proxy (PTID 23651)	05/01/2007 - 12/31/2021	79.95%	80.04%	79.88%	80.03%
	HQ Cedars Proxy (PTID 23651 until 10/1/2008 then 323590)	05/01/2007 - 12/31/2021	78.57%	78.51%	80.25%	80.30%
	NE Proxy (PTID 24062)	05/01/2007 - 12/31/2021	90.31%	90.22%	75.91%	75.69%
	NE CSC (PTID 323557)	08/01/2007 - 12/31/2021	92.05%	92.28%	72.61%	72.78%
	NE 1385 Proxy (PTID 323591)	08/01/2009 - 12/31/2021	86.02%	86.28%	73.19%	73.37%
	OH Proxy (PTID 24063)	05/01/2007 - 12/31/2021	86.24%	86.11%	77.02%	77.54%
	PJM Proxy (PTID 24065)	05/01/2007 - 12/31/2021	90.42%	90.18%	71.65%	71.85%
	PJM Neptune Proxy (PTID 323594)	07/01/2009 - 12/31/2021	92.03%	92.35%	71.53%	71.44%
	PJM VFT Proxy (PTID 23786 until 9/9/2009 then 323633)	05/01/2007 - 12/31/2021	84.42%	83.76%	76.05%	76.83%
	PJM HTP Proxy (PTID 323702)	06/01/2015 - 12/31/2021	94.75%	94.93%	70.90%	71.81%
		All Shoulder	86.54%	86.52%	75.39%	75.60%

Table M-2
Summary of Coverage of Payments Due for Proxy Buses
Alternative Hourly Groupings

			Virtual Demand		Virtual Supply	
		Collateral Date Range	1-Year Lookback	2-Year Lookback	1-Year Lookback	2-Year Lookback
Summer	Proxy Bus: HQ Import Proxy (PTID 23651 until 7/1/2007 then 323601)	05/01/2007 - 12/31/2021	79.39%	79.06%	83.68%	83.88%
	HQ Wheel Proxy (PTID 23651)	05/01/2007 - 12/31/2021	78.25%	77.72%	82.34%	82.64%
	HQ Cedars Proxy (PTID 23651 until 10/1/2008 then 323590)	05/01/2007 - 12/31/2021	75.55%	74.24%	82.06%	81.76%
	NE Proxy (PTID 24062)	05/01/2007 - 12/31/2021	89.87%	90.28%	76.27%	76.42%
	NE CSC (PTID 323557)	08/01/2007 - 12/31/2021	87.73%	87.59%	72.16%	72.56%
	NE 1385 Proxy (PTID 323591)	08/01/2009 - 12/31/2021	78.69%	78.82%	73.80%	74.34%
	OH Proxy (PTID 24063)	05/01/2007 - 12/31/2021	81.43%	81.26%	81.49%	81.71%
	PJM Proxy (PTID 24065)	05/01/2007 - 12/31/2021	91.26%	91.58%	68.91%	68.76%
	PJM Neptune Proxy (PTID 323594)	07/01/2009 - 12/31/2021	87.54%	87.34%	69.47%	69.64%
	PJM VFT Proxy (PTID 23786 until 9/9/2009 then 323633)	05/01/2007 - 12/31/2021	87.13%	87.35%	74.10%	75.38%
	PJM HTP Proxy (PTID 323702)	06/01/2015 - 12/31/2021	95.19%	96.17%	72.22%	73.10%
		All Summer	84.14%	84.00%	75.56%	75.89%
Winter	Proxy Bus: HQ Import Proxy (PTID 23651 until 7/1/2007 then 323601)	05/01/2007 - 12/31/2021	85.81%	85.20%	74.38%	73.46%
	HQ Wheel Proxy (PTID 23651)	05/01/2007 - 12/31/2021	85.44%	84.81%	74.96%	73.95%
	HQ Cedars Proxy (PTID 23651 until 10/1/2008 then 323590)	05/01/2007 - 12/31/2021	83.60%	83.61%	73.91%	73.00%
	NE Proxy (PTID 24062)	05/01/2007 - 12/31/2021	88.69%	87.86%	78.80%	77.96%
	NE CSC (PTID 323557)	08/01/2007 - 12/31/2021	91.34%	91.32%	75.73%	76.80%
	NE 1385 Proxy (PTID 323591)	08/01/2009 - 12/31/2021	86.98%	87.31%	74.86%	76.00%
	OH Proxy (PTID 24063)	05/01/2007 - 12/31/2021	83.11%	83.39%	74.51%	73.58%
	PJM Proxy (PTID 24065)	05/01/2007 - 12/31/2021	87.66%	87.26%	70.64%	69.94%
	PJM Neptune Proxy (PTID 323594)	07/01/2009 - 12/31/2021	89.79%	90.04%	73.68%	74.12%
	PJM VFT Proxy (PTID 23786 until 9/9/2009 then 323633)	05/01/2007 - 12/31/2021	83.14%	82.60%	76.65%	75.43%
	PJM HTP Proxy (PTID 323702)	06/01/2015 - 12/31/2021	89.24%	89.88%	72.94%	73.77%
		All Winter	86.92%	86.73%	74.99%	74.74%
Shoulder	Proxy Bus: HQ Import Proxy (PTID 23651 until 7/1/2007 then 323601)	05/01/2007 - 12/31/2021	81.08%	81.07%	80.60%	80.61%
	HQ Wheel Proxy (PTID 23651)	05/01/2007 - 12/31/2021	79.98%	80.04%	80.60%	80.65%
	HQ Cedars Proxy (PTID 23651 until 10/1/2008 then 323590)	05/01/2007 - 12/31/2021	78.46%	78.45%	80.78%	80.81%
	NE Proxy (PTID 24062)	05/01/2007 - 12/31/2021	90.35%	90.22%	76.26%	75.81%
	NE CSC (PTID 323557)	08/01/2007 - 12/31/2021	92.14%	92.36%	73.00%	73.02%
	NE 1385 Proxy (PTID 323591)	08/01/2009 - 12/31/2021	86.14%	86.36%	73.51%	73.76%
	OH Proxy (PTID 24063)	05/01/2007 - 12/31/2021	86.27%	86.09%	77.91%	78.32%
	PJM Proxy (PTID 24065)	05/01/2007 - 12/31/2021	90.51%	90.21%	72.40%	72.47%
	PJM Neptune Proxy (PTID 323594)	07/01/2009 - 12/31/2021	92.16%	92.40%	71.98%	71.70%
	PJM VFT Proxy (PTID 23786 until 9/9/2009 then 323633)	05/01/2007 - 12/31/2021	84.48%	83.76%	76.62%	77.26%
	PJM HTP Proxy (PTID 323702)	06/01/2015 - 12/31/2021	94.77%	94.90%	71.75%	72.30%
		All Shoulder	86.58%	86.54%	75.94%	76.02%

Questions?

Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

New York ISO