Comments of the New York Independent System Operator, Inc.
On the 2015 Ozone NAAQS Preliminary Transport Data

Docket No. EPA-HQ-OAR-2016-0751

April 6, 2017

I. Introduction

The New York Independent System Operator, Inc. ("NYISO") is an independent not-for-profit corporation responsible for the reliable operation of New York's high-voltage transmission lines including the dispatch of electric power generators. In addition, the NYISO administers wholesale electricity markets which clear billions of dollars in transactions for electricity and related products annually. Finally, the NYISO conducts robust planning processes to maintain resource adequacy and transmission security throughout the New York bulk power transmission system. The NYISO's mission is to serve the public interest and provide benefit to consumers by maintaining and enhancing regional reliability; operating open, fair and competitive wholesale electricity markets; planning the power system for the future; and providing factual information to policy makers, stakeholders, and investors in the power system.

On January 6, the Environmental Protection Agency ("EPA") published in the Federal Register for public comment preliminary interstate ozone transport modeling data and associated methods related to the 2015 Ozone National Ambient Air Quality Standard ("NAAQS") (hereinafter referred to as the "Updated Ozone Transport Model").[1]

The NYISO appreciates this opportunity to comment on the Updated Ozone Transport Model, and offers these comments to assist the EPA's efforts to develop an accurate electric system model of New York State. Accurate electric system modeling is essential to achieving the objectives of the Updated Ozone Transport Model, including the equitable allocation of NO_x allowances to New York State and throughout the neighboring regions with which the New York electric system is interconnected. As it has previously commented to the EPA, the Updated Ozone Transport Model should more accurately model several aspects of the New York bulk power system and interconnected generation.[2, 3] Specifically, the model should more closely reflect operational parameters and specific environmental and reliability rules to create results that accurately represent the future expected operation of the New York bulk power system.

The EPA should also provide data showing the impact of the power sector on emission levels and their contribution to potential exceedances to allow electric system planners to account for these impacts and for the future availability of resources to maintain system reliability. Accordingly, the NYISO requests that the EPA consider these concerns and amend

---

[1]Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard (NAAQS), 82 Fed. Reg. 1733 (January 6, 2017).

[2]http://www.nyiso.com/public/webdocs/markets_operations/documents/Legal_and_Regulatory/Other_Filings/Other_Filings/2016_02_01_NYISO_CSAPR%20OS%20NOx%20Cmmnts.pdf ("2016 CSAPR Comments").

[3]http://www.nyiso.com/public/webdocs/markets_operations/documents/Legal_and_Regulatory/Other_Filings/Other_Filings/2016_1_21_NYISO_Comments_CPP_FPMTR.pdf ("2016 CPP Comments").

the representation of the New York State bulk power system prior to finalizing the Updated Ozone Transport Model.

II. The EPA Should Amend its Modeling of the New York Bulk Power System.

The NYISO previously commented on the EPA's modeling of the New York bulk power system in its Comments on the Proposed Cross-State Air Pollution Rule ("CSAPR") Update Rule.[4] The NYISO reiterates its comments in this proceeding, updated to reflect the most recent Notice of Data Availability ("NODA").

Specifically, the historical and forecasted generation levels contained in the Integrated Planning Model ("IPM") employed by the EPA should be more consistent with generators' actual geographic locations, unit types, and fuel use distributions. This could be accomplished by more accurately modeling electric system transfer limits in the IPM model between and among load zones in the NYISO and surrounding regions. There are additional reliability rules imposed within New York State that are associated with the distribution of generation and their emissions in time and space which, in turn, affect modeled contributions at downwind receptors.

The IPM used by the EPA for crafting air emission programs should more accurately reflect the intricacies of the New York Bulk Electric System ("BES"), as previously reflected in the NYISO's comments.[5] New York has eleven (11) geographic zones that represent load centers defined by electric transfer limits and within which the wholesale prices for energy and capacity are near uniform. The EPA's current IPM topology only represents seven (7) zones for New York State.[6] Inclusion of all 11 New York zones in the EPA IPM topology would reflect important inter-zonal transfer limits at key interfaces on the New York system.

The IPM should also reflect intra-zonal limitations within several of the 11 zones internal to the New York Control Area, which contain load pockets resulting from electrical constraints that limit the importation of electricity into specific regions within those zones. These constraints require the use of generators that may not otherwise be dispatched and alter the location and timing of the operation and emission patterns otherwise forecasted in the IPM.

Figure 1 below shows the comparison of NYISO historical and aggregate New York City and Long Island generation from the NYISO's economic planning process, along with the results from the EPA IPM NODA. The NYISO's economic planning process is the Congestion Assessment and Resource Integration Study ("CARIS").[7] In the CARIS process, the NYISO performs extensive benchmarking of its production simulation model against actual historical

[4] *See* 2016 CSAPR Comments.

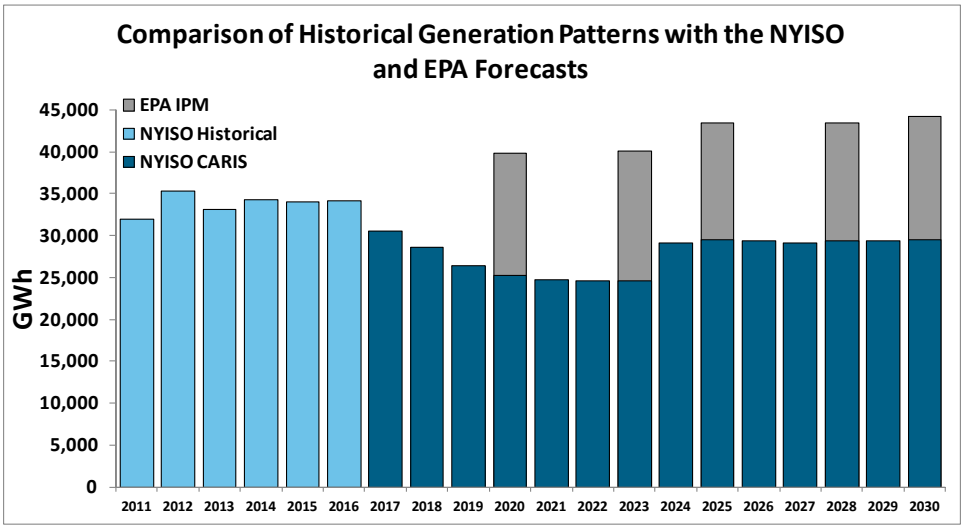
[5] *See* 2016 CPP Comments at p. 13.

[6] https://www.epa.gov/airmarkets/epas-power-sector-modeling-support-notice-data-availability-preliminary-interstate-ozone.

[7] *See* http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Economic_Planning_Studies_%28CARIS%29/CARIS_Final_Reports/2015_CARIS_Report_FINAL.pdf.

data before it projects future years for the study. Based on the NYISO's experience from its benchmarking efforts, the NYISO notes that the IPM model includes downstate generation levels that are inconsistent with levels the NYISO has observed in the past and that are not similar to the levels contained in the NYISO's economic studies.

Figure 1



Accurate representation of transmission capabilities, generator resource operational performance, and economic characteristics are foundational elements of power system models. In addition, there are a number of New York-specific environmental and reliability rules, as discussed below, which may have impacts on generation and emission patterns throughout the state. The NYISO remains ready to assist the EPA in improving their model of the New York electric system. Further, the New York electric system is subject to numerous stringent reliability rules from North American Electric Reliability Corporation, the Northeast Power Coordinating Council, and the New York State Reliability Council. The impact of these rules should be captured in the EPA's version of the model. Among these rules are requirements to design and operate the electric grid to higher standards in New York than are applicable elsewhere, including requirements to:

1. design and secure the system for the occurrence of a second contingency;[8]

2. secure the system against the loss of gas in New York City and on Long Island through the use of oil burning generators;[9]

3. operate the system with multiple load pockets within New York City that require generators to operate within each of the load pockets;

[8] *See* http://www.nysrc.org/pdf/Reliability%20Rules%20Manuals/RRC%20Manual%2034%20final%201-9-15.pdf ("Reliability Rules & Compliance Manual") at p. 84.

[9] *See id.* at pp. 87 and 90.

4. secure the system against the potential loss of transmission facilities during periods when thunderstorms are possible;[10] and

5. operate certain generators to satisfy NO_X RACT compliance averaging plans.

Special alterations to the dispatch order are required almost every day to operate generators, or to have generators available to satisfy these reliability and environmental rules. All of these characteristics of the New York State BES should be accurately reflected in models used to develop rules regulating the operation of generators in New York.

III. The EPA Should Consider Additional Improvements in Modeling the New York State Bulk Power System.

The EPA should consider the following changes to its modeling procedures:

1. To obtain more meaningful and transparent results, the EPA should update the Ozone Transport Model with data for the first year of implementation of the Updated Ozone Transport Model, when that year is known.

2. Given the uncertainty regarding generator deactivations and additions, the EPA should employ multiple scenarios to consider how the rules could apply across the range of potential generation fuel mix futures. Examining a range of assumed generator deactivation and generation addition scenarios will provide the EPA and stakeholders with information regarding the suite of options that could be employed to comply with more stringent air emission requirements.

3. In order to provide an accurate representation of the capability of intermittent resources in evaluating the future resource mix in the ozone transport model, capacity factors for intermittent resources should be modeled consistent with those resources' actual output. As set forth below for wind and solar resources, New York's experience with these types of facilities is already reflected in the NYISO's economic planning process model. Table 1 below shows the actual New York capacity factors demonstrated by resource type from the NYISO's economic planning process data and models, and compares those results with the values assumed for use in the IPM model:

[10] *See id*. at p. 84.

Table 1

Modeled Capacity Factor	EPA IPM	NYISO CARIS
New Onshore Wind	39%	26%
New Photovoltaic ("PV")	18%	14%
Existing natural gas-fired combined-cycle turbines ("NGCC")	82%	50%
Existing Hydro	69%	62%

A. Wind: The IPM models existing (onshore) wind at a 24% capacity factor, while new (onshore) wind is assumed to have a capacity factor of 39% beginning in 2018 and continuing through the remainder of the modeled time horizon (2050). The historical New York wind fleet net-capacity factor has remained between 22 and 27%.[11] The EPA should revise the New York new wind capacity factor to more closely align with historical performance of wind generators.

B. Solar: Existing PV resources are modeled in IPM with a capacity factor of 19%. The EPA should reevaluate the PV capacity factor used in New York and revise it as necessary in order to ensure that these resource types are accurately modeled. The IPM assumed that new solar resources in New York operate at a capacity factor of 18.4%. In its planning studies, the NYISO uses a value closer to 13.5%, which is representative of historical performance levels.[12] Currently, the NYISO has over 880 MW of PV projects within its interconnection queue ranging in size from under 10 MW up to 98 MW.[13] In addition, as of February 2017, utilities in New York State report a total of 3,550 MW of small systems (mostly between 1 and 2 MW) that plan to connect at the distribution system level.[14] These levels of PV additions may have significant impacts on emission patterns. The EPA should make a reasoned assumption of expected capacity factors and capacity additions based on available information as to the appropriate amount of PV resources to include going forward.

4. The IPM results for New York indicate that generation from existing NGCC in 2023 is more than 67% greater than found in the NYISO's 2015 CARIS. The resulting capacity factor for the existing NGCC fleet is 82% in IPM, as compared to 50% in the NYISO's model, which is based upon historical operating data.

[11] http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2016_NYCA_Generators.xls.

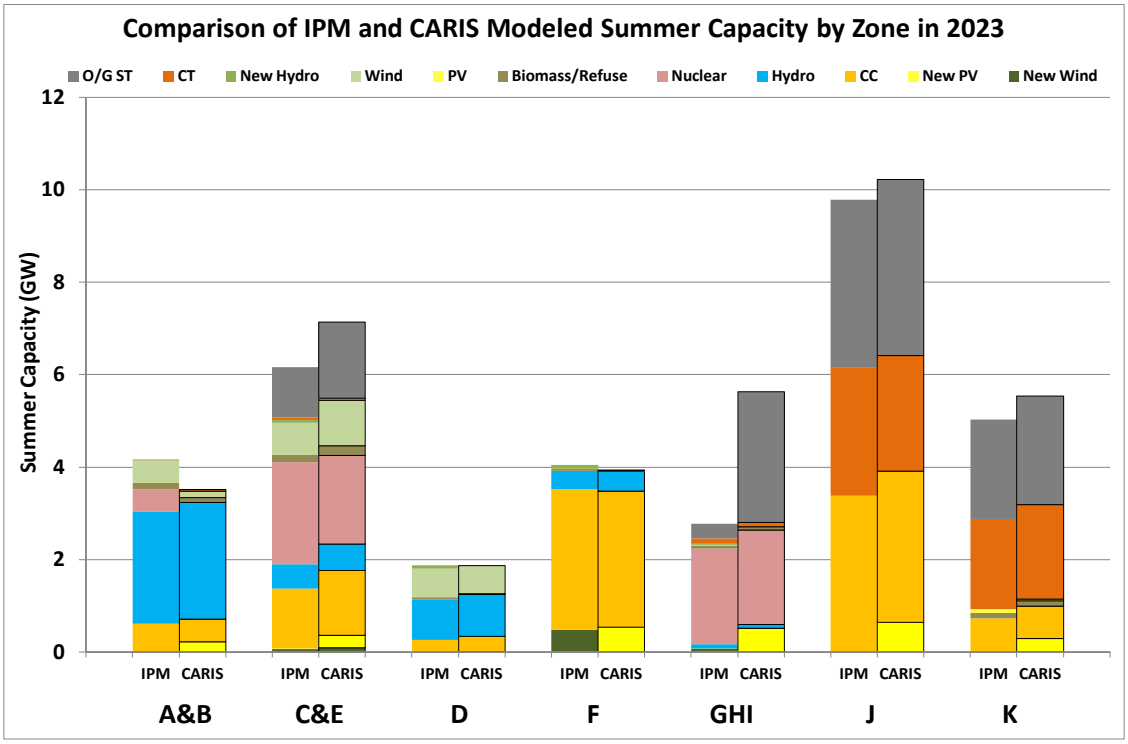
[12] http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Special_Studies/Special_Studies_Documents/Solar%20Integration%20Study%20Report%20Final%20063016.pdf.

[13] http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Interconnection_Studies/NYISO_Interconnection_Queue/NYISO%20Interconnection%20Queue.xls.

[14] http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/286d2c179e9a5a8385257fbf003f1f7e/$FILE/ATTW198V.pdf/February%202017%20Queue%20Summary.pdf.

5. Upstate New York has a number of NGCC generators that historically operate at lower capacity factor levels than do the downstate NGCCs.[15] Figure 2 and Figure 3 below show the capacity and generation comparison among the EPA IPM and the NYISO's CARIS results by zone in 2023, highlighting the disparity in modeling assumptions and results. Tables 2 and 3 below provide this comparison in numerical values for the EPA IPM and NYISO CARIS model, respectively. These comparisons demonstrate that the NGCC energy output throughout New York State is significantly larger in the IPM results.[16] This disparity may be the result of inaccurately modeled transfer limits between zones in New York State. Accordingly, the EPA should refine its model to more accurately reflect the transfer limits and, therefore, the projected NGCC generation in different areas of New York State.

Figure 2



[15] http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2015%20Load%20and%20Capacity%20Data%20Report.pdf.

[16] The EPA IPM in the DAT Replacement file should clearly define the difference between generation and the load required to be met, the difference being supply vs. demand. As currently presented, the load figures appear to be indicated as generation values.

Figure 3

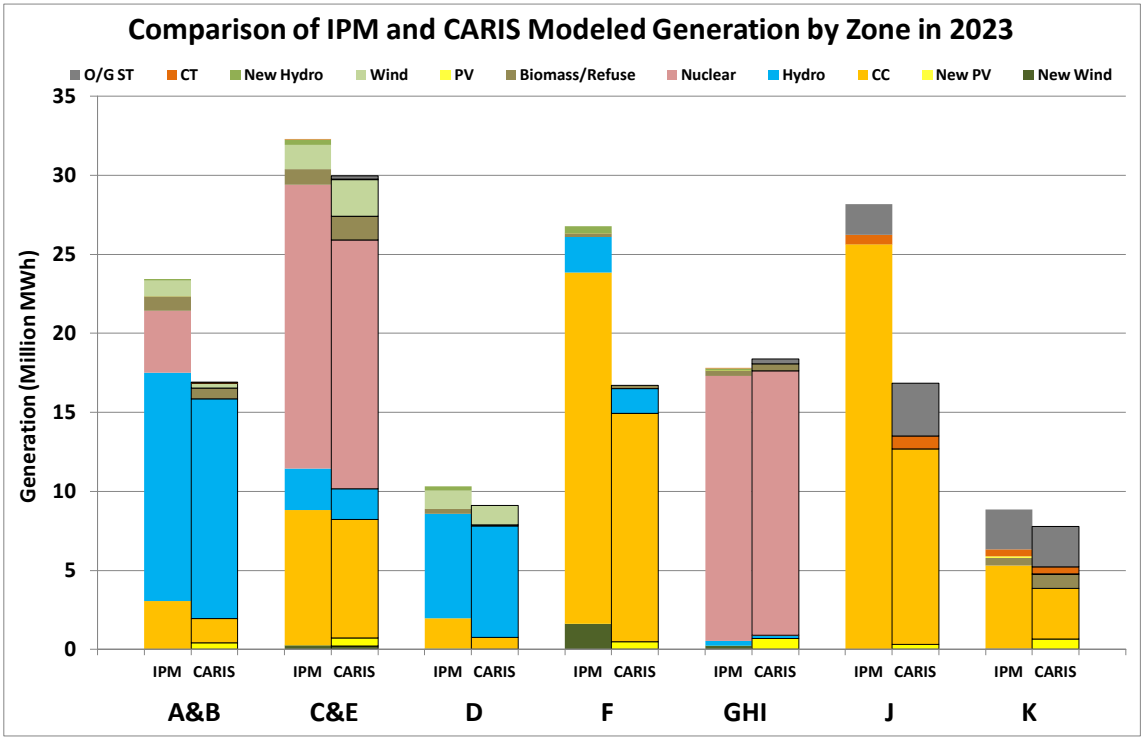


Table 2

Zone	New Wind	New PV	CC	Hydro	Nuclear	Biomass/ Refuse	PV	Wind	New Hydro	CT	O/G ST
IPM MW											
A&B	8	9	591	2,420	490	144	1	474	20	1	-
C&E	64	7	1,298	528	2,212	156	-	689	66	51	1,088
D	14	2	252	872	-	47	-	621	49	4	-
F	487	2	3,031	402	-	46	2	-	78	-	-
GHI	74	1	-	97	2,061	80	2	-	28	112	315
J	-	-	3,377	-	-	-	2	-	-	2,785	3,624
K	19	-	711	-	-	122	73	-	-	1,960	2,145
IPM GWh											
A&B	31	14	3,026	14,442	3,919	906	2	995	110	-	-
C&E	261	11	8,564	2,596	17,967	992	-	1,519	369	23	-
D	65	3	1,917	6,585	-	310	-	1,176	274	-	-
F	1,625	3	22,234	2,238	-	224	3	-	438	-	-
GHI	242	2	-	300	16,764	325	4	-	157	0	-
J	-	-	25,615	-	-	-	3	-	-	619	1,920
K	74	-	5,246	-	-	457	119	-	-	453	2,506

Table 3

Zone	New Wind	New PV	CC	Hydro	Nuclear	Biomass/ Refuse	PV	Wind	New Hydro	CT	O/G ST
CARIS MW											
A&B	-	217	495	2,524	-	101	-	142	-	39	-
C&E	93	264	1,408	571	1,916	207	-	985	-	50	1,643
D	-	7	327	919	-	13	-	601	-	-	-
F	-	539	2,940	430	-	32	-	-	-	-	-
GHI	-	511	-	82	2,052	60	-	-	-	104	2,817
J	-	640	3,271	-	-	-	-	-	-	2,497	3,817
K	-	295	693	-	-	120	32	-	-	2,051	2,346
CARIS GWh											
A&B	-	419	1,554	13,873	-	711	-	304	-	50	-
C&E	215	510	7,513	1,943	15,722	1,512	-	2,299	-	33	223
D	-	30	720	7,071	-	78	-	1,199	-	-	-
F	-	476	14,445	1,573	-	209	-	-	-	-	-
GHI	-	688	-	221	16,706	452	-	-	-	-	315
J	-	311	12,374	-	-	-	-	-	-	821	3,355
K	-	651	3,198	-	-	898	51	-	-	424	2,555

The discrepancies between NYISO-observed operational transfer limitations between zones and across interfaces in New York and those reflected in the IPM model produce results that over predict Upstate NGCC generation. Accordingly, the EPA should reevaluate the assumptions that lead to excessive generation levels from existing NGCCs.

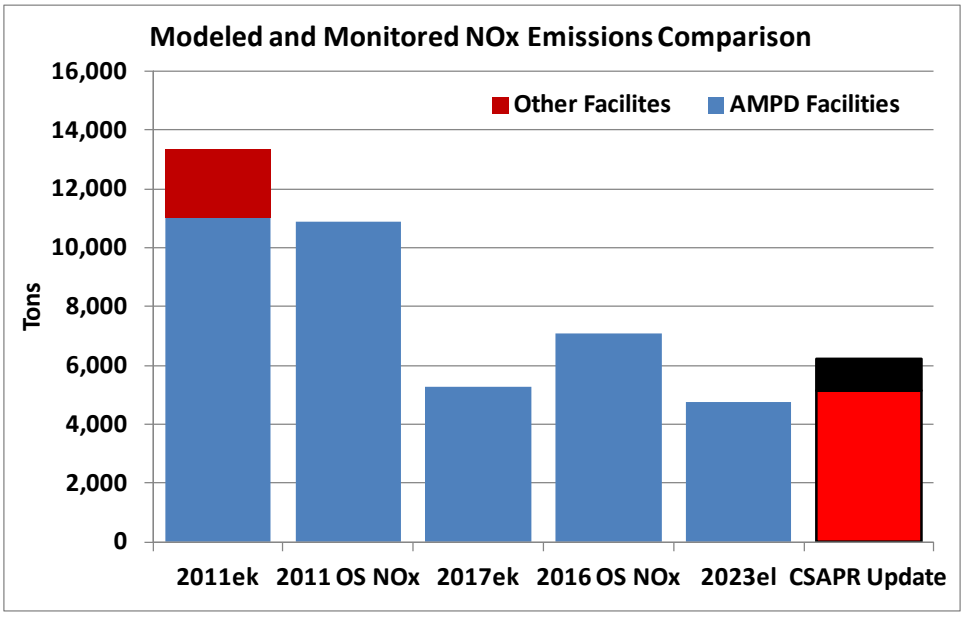
IV. EPA Modeling Results Should be Provided to Allow Examination of Power Sector Impacts and Operations Associated with Peak Generation and Peak Ozone Concentration

The NYISO compared IPM modeled and measured EPA AMPD[17] ozone season NO_X emissions to assess model results and actual operations as reported to EPA.[18] Figure 4 below displays good correlation in the baseline year between the emissions in IPM (2011ek) and those reported to EPA (2011 OS NO_X). However, modeled emissions in 2017 (and 2023) would require a reduction from actual of approximately 50% of 2011 levels and 25% of 2016 levels (2016 OS NO_X) as shown. The prime factors driving these emission reductions are difficult to determine from the limited model output and results. New York limits applicable in the CSAPR Update Rule are shown for comparison.

[17] https://ampd.epa.gov/ampd/QueryToolie.html.

[18] https://www.regulations.gov/document?D=EPA-HQ-OAR-2016-0751-0026.

Figure 4



The modeling results made available by the EPA may make it difficult to calculate the impact of the power sector to the monitored concentrations and potential exceedance. Statewide results have been reported by sector on a daily basis or over an annual or monthly time frame by county. Nevertheless, there is no clear way to examine the contribution of a state's power sector to the downwind monitors during the instances of exceedance events. Specifically, the EPA should provide data regarding the impact of New York generation OS NOx emissions on the monitored concentrations at three Connecticut monitors of interest. Providing results for peak generation day and for peak ozone concentration days would allow electric system planning to account for power sector emissions and their impacts on the availability of resources in the future.

V. Conclusion

The NYISO appreciates the opportunity to comment on the Updated Ozone Transport Model. While the NYISO is not taking a position on the policy objectives of these programs, these comments are intended to assist the EPA by identifying opportunities to improve the EPA's modeling of the New York bulk power system in a manner consistent with its characteristics and actual system operating experience. Accordingly, the NYISO respectfully requests that the EPA consider these comments before finalizing the Updated Ozone Transport Model. The NYISO stands ready to assist the EPA in this effort.

Respectfully submitted,

/s/ *Zach Smith*
Zach Smith, Vice President of System & Resource Planning
Carl F. Patka, Assistant General Counsel
James H. Sweeney, Senior Attorney
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, NY 12144
Tel: (518) 356-6000
ZSmith@nyiso.com
JSweeney@nyiso.com