Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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April 6, 2017

Via Electronic Submission
to the Federal eRulemaking Portal
http://www.regulations.gov

U.S. Environmental Protection Agency
Docket ID No. EPA-HQ-OAR-2016-0751

RE: 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)

Dear Mr. Reid Harvey:

As you know, Connecticut has suffered disproportionately from the U.S. Environmental Protection Agency's (EPA's) failure to adequately address ozone transport and continues to urge EPA to do as required by the Clean Air Act as our citizens have an expectation of breathing clean air. With that in mind, the Connecticut Department of Energy and Environmental Protection (Department) welcomes the opportunity to comment on EPA's *Notice of Availability of the Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard* (82 FR 1733, January 6, 2017) (Transport NODA). EPA issued the Transport NODA, which includes air quality modeling projections for 2023, to assist states with preparing State Implementation Plans (SIPs) to address the "Good Neighbor" (GN) emission transport requirements of Clean Air Act (CAA) section 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS.

Despite Connecticut's ongoing commitment to implement emission control programs that are among the most stringent in the nation, Connecticut's citizens continue to be exposed to unhealthy ozone levels caused by transported emissions from upwind areas.[1] This is evidence of the failure of upwind states to satisfy the GN requirements and the failure of EPA to enforce the GN requirements. With the more stringent 2015 ozone NAAQS leaving millions of Americans without the clean air provided for in CAA Section 110, it is critical to plan now for GN SIPs to be submitted on time and such that attainment within the timeframe established by the ozone classification actually occurs. Unfortunately for Connecticut's citizens, EPA has not yet successfully established a framework that results in emissions reductions that satisfy the GN requirements for the previous ozone NAAQS. The people of Connecticut could have clean air if EPA does what is required-- identify upwind states that contribute significantly to downwind ozone problems, determine appropriate emission reductions needed from the upwind states to address transport, and require contributing states to adopt rules in their GN SIPs to secure the emission reductions. To date, EPA's framework for interstate transport has failed to secure adequate emissions in upwind states, since upwind state emissions continue to significantly interfere with attainment in Connecticut.[2]

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[1] EPA modeling estimates that almost 95% of high ozone levels at Connecticut's worst-case monitor (in Westport) are due to emission sources outside of Connecticut's jurisdiction to control.

[2] For example, the CSAPR Update is estimated to improve ozone levels in Connecticut by less than 0.5 ppb, a miniscule fraction of the current measured design value at Westport of 84 ppb.

In the Transport NODA, EPA proposes to apply the same framework to address ozone transport for the 2015 NAAQS, even though that framework fails to satisfy the CAA's GN provisions under the 2008 ozone NAAQS. Furthermore, EPA has acknowledged that the CSAPR Update is only a partial remedy for the 2008 NAAQS, targeted at emission reductions that could be delivered in 2017.[3] The CAA does not allow for a partial remedy to interstate transport, since people in all parts of the county are given this protection from transported emissions that interfere with ozone attainment. EPA should implement the recommendations below and take other actions, as necessary, to achieve the required full remedy for the 2008 NAAQS as soon as possible, without waiting to couple it with any actions related to the 2015 NAAQS.

- Improve the accuracy of ozone modeling projections: EPA's transport modeling is overly optimistic, underestimating the severity and geographic extent of the ozone problem and levels of transport impacting Connecticut and other states. Without correction, the projections will only exacerbate the inadequacy of the upwind emission reductions resulting from EPA's GN framework.
- Improve the accuracy of EGU emission projections: The economic-based IPM modeling used by EPA to project EGU emissions falsely predicts that large numbers of coal and oil-fired EGU will retire or not operate in the near future. IPM also fails to represent EGU operations accurately on high ozone days. These shortcomings result in significantly lower emission projections than are likely to occur, potentially affecting model performance and further exacerbating the inadequacy of the emissions reductions required in upwind states.
- Require more equitable controls that provide sufficient downwind ozone improvements: EPA's most recent transport FIPs have established NOx control cost levels of $500/ton and $1,300/ton, far below cost levels implemented by many Northeast states in RACT SIPs and other control programs for ozone precursors. SIPs/FIPs should include control measures with cost thresholds more consistent with those in the Northeast and should include non-EGU sources, as well as area and mobile sources.

A detailed discussion of the Department's recommendations is set out in the enclosed comments.

Connecticut's long-standing challenge to provide healthy air to its citizens continues to be dependent on actions by EPA and upwind states to address the interstate transport of ozone and its precursors as required by the CAA. With that in mind, the Department not only encourages EPA to establish a framework that fully satisfies the CAA's GN provisions now but also to move forward with national strategies to complement state GN SIPs, such as regulations to tighten NOx standards for trucks and to strengthen requirements for automotive aftermarket catalysts.

Sincerely,

Anne Gobin
Chief, Bureau of Air Management

Enclosure
Cc: Reid Harvey, Steve Page, Chet Wayland, Michael Koerber, David Conroy (by e-mail)

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[3] Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS: Final Rule, 81 FR 74504 at 74516 (October 26, 2016).

CT DEEP Comments on
EPA's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone NAAQS

BACKGROUND

In the January 6, 2017 Federal Register, the Environmental Protection Agency (EPA) released preliminary interstate ozone transport modeling data[1] (Transport NODA) for public review and comment. EPA provided the information to help states develop State Implementation Plans (SIPs) required by the "Good Neighbor" (GN) transport provisions of Clean Air Act (CAA) section 110(a)(2)(D)(i)(I) for the 2015 ozone national ambient air quality standard (NAAQS). The information includes emission inventories and air quality modeling results for 2017 and 2023, along with associated methods and data. In addition to projected average and maximum ozone design values, the 2023 modeling results include projected contributions at individual ozone monitoring sites from state-specific anthropogenic emissions and other contribution categories.

The CAA GN provision requires each state to revise its SIP, as necessary, to prohibit emissions that significantly contribute to nonattainment of, or interfere with maintenance of, a NAAQS in a downwind state. States are required to prepare and submit GN SIPs to EPA for the 2015 ozone NAAQS by October 26, 2018. EPA previously issued a memorandum[2] outlining EPA's expectations for implementing the 2015 NAAQS. Among other things, EPA indicates in the memorandum that the GN provision for the 2015 ozone NAAQS can be addressed in a timely fashion using the framework of the Cross-State Air Pollution Rule (CSAPR). EPA has applied the CSAPR framework to address the GN provision for previous standards for ozone and other criteria pollutants.

The CSAPR framework is a four-step process:

1) Identifying downwind receptors expected to have problems attaining or maintaining a NAAQS;
2) Determining which upwind states contribute to these identified problems in amounts sufficient to "link" them to the downwind air quality problems;
3) Identifying upwind emissions that significantly contribute to nonattainment or interfere with maintenance of a standard by quantifying appropriate upwind emission reductions and assigning upwind responsibility among linked states; and
4) Reducing the identified upwind emissions via permanent and enforceable requirements.

The information contained in EPA's current NODA for the 2015 ozone NAAQS only addresses the first two steps in the CSAPR framework. For both the 1997 and 2008 ozone NAAQS, EPA finalized Federal Implementation Plans (FIPs) intended to address the last two steps of the framework, providing at least partial remedies to address ozone transport impacting downwind states. For the 2015 NAAQS, EPA has not indicated if or when the agency plans to identify necessary upwind emission reductions or propose a FIP requiring those reductions to be permanent and enforceable. The CAA requires EPA to promulgate FIPs for states that do not submit timely GN SIPs or that submit GN SIPs that are disapproved by EPA.

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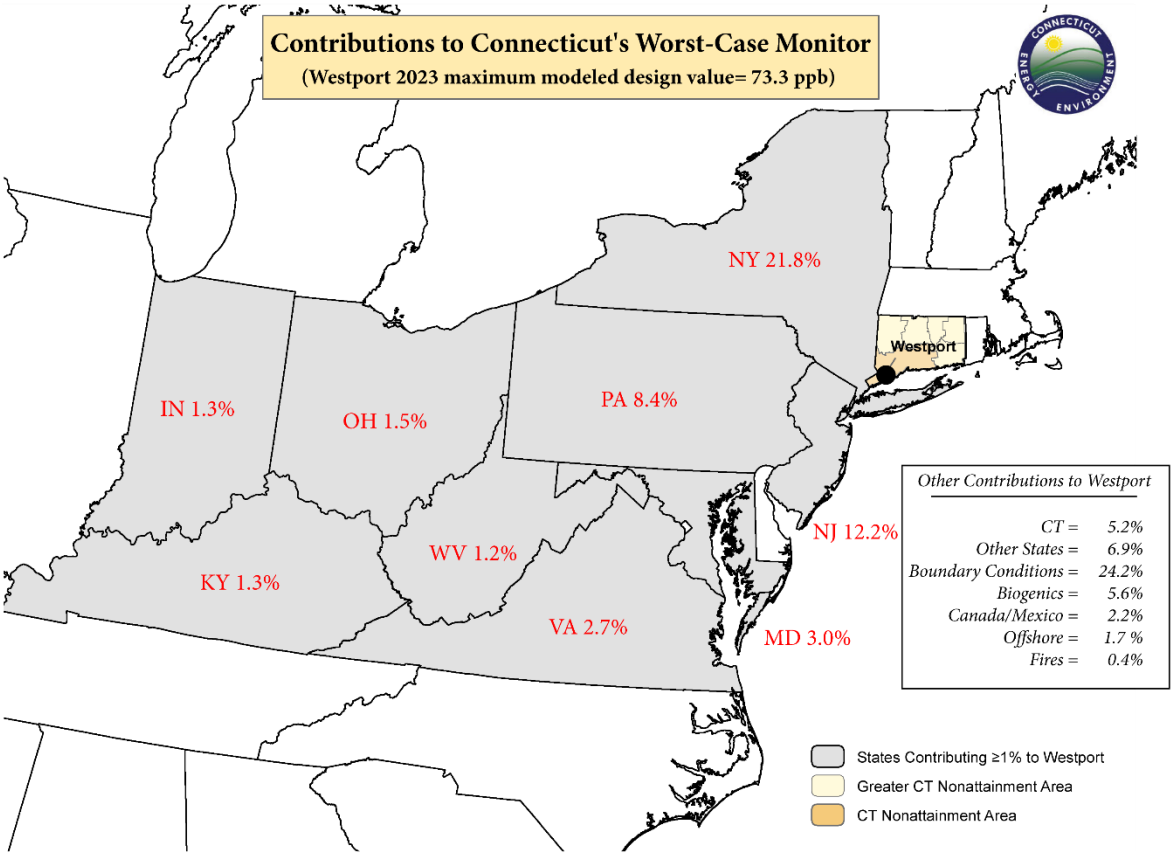
[1] See 82 FR 1733; "Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard"; January 5, 2017.

[2] October 1, 2016 memorandum from Janet McCabe, Acting Assistant administrator, Office of Air and Radiation to Regional Administrators, Regions 1–10, ''Implementing the 2015 Ozone National Ambient Air Quality Standards,'' available at https://www.epa.gov/sites/production/files/2015-10/documents/implementation_memo.pdf.

CT DEEP COMMENTS

The Connecticut Department of Energy and Environmental Protection (CT DEEP) appreciates the opportunity to comment on the Transport NODA, as interstate air pollution is responsible for the overwhelming portion of Connecticut's ozone problem. Consistent with transport modeling conducted by EPA for the 2008 ozone NAAQS, EPA's preliminary modeling for 2023 indicates that almost 95% of high ozone levels at Connecticut's worst-case monitor (sited in Westport, along Connecticut's southwest coastline) are caused by sources located outside the State of Connecticut.[3] Connecticut's geographic location and predominant meteorological patterns during ozone events place the state downwind of emissions from large urban areas, electric generating units (EGUs) and other industrial sources in upwind states that contribute to these levels of overwhelming transport. **Figure 1** summarizes the findings of EPA's NODA modeling for the Westport monitor, illustrating the magnitude of contributions from upwind areas relative to those from Connecticut sources.

Figure 1: Ozone contributions to the Westport CT monitor as projected by EPA's NODA modeling.



[3] Including all biogenic sources located throughout the modeling domain.

CT DEEP continues to pursue adoption of control measures[4] to minimize the contribution of in-state sources to Connecticut's ozone problem. However, when the level of overwhelming transport is considered in the context of current design values (Westport's preliminary 2016 ozone design value is 85 ppb, compared to the 2015 NAAQS of 70 ppb), it is clear that attainment can only be achieved in Connecticut through the implementation of strong GN SIPs by upwind states and additional federal measures by EPA, coupled with appropriate cost-effective local emission reductions.

CT DEEP shares the concerns expressed in separate comments submitted by the states of the Ozone Transport Commission (OTC). CT DEEP's additional comments focus on four main issues, as more fully described below:

1) The need to modify the CSAPR framework to ensure it provides meaningful transport relief;
2) The need for EPA to require upwind areas to provide the required full transport remedy for the 2008 ozone NAAQS;
3) Ozone underpredictions by the EPA's modeling platform mischaracterize the scale of needed transport relief;
4) Continuing problems with EPA's IPM emission projections for EGUs may contribute to the modeled underpredictions of ozone levels.

EPA's CSAPR Framework Should Be Modified to Provide Meaningful Transport Relief

EPA has used the CSAPR framework to develop regional NOx emission reduction programs to address interstate transport for both the 1997 and 2008 ozone NAAQS. While CT DEEP generally supports EPA's approach, the application of the framework by EPA has been ineffective at reducing interstate transport of ozone into Connecticut. The CSAPR program (for the 1997 NAAQS) and CSAPR Update program (for the 2008 NAAQS) are each estimated by EPA modeling to provide less than a 0.5 ppb improvement on high ozone days in Connecticut. Current (but preliminary) ozone design values in Connecticut are as high as 85 ppb (measured near the state's upwind border), still well above the 2008 NAAQS of 75 ppb. With almost 95% of Connecticut's highest ozone levels resulting from transported emissions, the relief projected from these control programs is woefully inadequate, making it impossible for Connecticut to achieve timely attainment.

EPA's transport framework should be modified in several ways to more equitably identify appropriate levels of emission reductions required from contributing states.

- EPA should increase collaboration with states to ensure that emission inventories and meteorological data used in transport modeling are as accurate and representative as possible. As described later in these comments, improvements in EGU emission projections are needed and may be at least partially responsible for ozone underpredictions by EPA's modeling. In addition, the OTC comment letter includes discussion regarding improvements needed in meteorological data selection that would more fully represent the range of meteorological conditions that produce high ozone events in the northeast and could improve model performance.

- Base period, rather than future year, modeling should be used to identify all upwind states that contribute at least 1% to problem monitors in other states. The base period selected should be representative of the period of data used to establish designations for the relevant standard. All upwind states that contribute significantly to the initial determination of nonattainment should be

[4] See CT's recent RACT revisions (http://www.ct.gov/deep/cwp/view.asp?a=2684&q=546804&deepNav_GID=1619), as well as additional stationary and mobile source control measures implemented or planned to reduce ozone precursors (http://www.ct.gov/deep/cwp/view.asp?a=2684&q=585816&deepNav_GID=1619).

held accountable to address their share of transport. EPA's use of a future year tied to the moderate attainment deadline (6 years after designations) likely excludes some of the states that contributed to initial nonattainment designations. Furthermore, the associated delays in the delivery of transport reductions will impede the expeditious attainment of marginal areas that are required to comply with the NAAQS within 3 years of designations. The delay will also increase the likelihood that marginal areas will fail to attain on time, resulting in bump-up to moderate status, especially if EPA implements the classification procedures described in the proposed Implementation Rule for the 2015 NAAQS.[5]

- EPA has previously cited a legal obligation to avoid over-control of emissions in any state when promulgating transport FIPs. EPA also has a CAA obligation to avoid under-controlling culpable sources as occurred with the CSAPR and CSAPR Update FIPs. Those FIPs provided miniscule relief to Connecticut, the state most greatly impacted by transport, preventing timely attainment. When developing the CSAPR and CSAPR Update programs, EPA used cost thresholds of $500 per ton of NOx reduced and $1,300/ton, respectively, which are far below the cost thresholds routinely used by northeast states for establishing RACT and other emission control programs. For example, Delaware has an estimated cost effectiveness threshold up to $12,300/ton for NOx RACT and up to $78,000 to $90,000/ton for combustion turbines and generators that operate mainly on high ozone days.[6] The New Jersey Department of Environmental Protection adopted RACT rules in 2009 that determined reasonable cost effective thresholds up to $18,000/ton for boilers and up to $44,000/ton for combustion turbines that operate mainly on high electric demand days.[7] State GN SIPs and EPA FIPs should include control measures with comparable costs to fully address transport obligations. Control measures targeted at sources operating on high ozone days should also be evaluated, with consideration given to hourly/daily emission limits and performance standards. In addition, source categories evaluated should be expanded beyond the EGU sector to include non-EGU point sources, area sources and mobile sources.

- After potential cost-effective emission reductions are identified, photochemical modeling should be conducted to quantify the corresponding improvements in ozone levels at each downwind state problem receptor. The modeling results should then be evaluated to determine whether ozone improvements are sufficient to enable downwind states to reach timely attainment with a reasonable level of in-state controls. This process should be iterative, as necessary, to identify an equitable balance between upwind and downwind emission reduction requirements.

- Although the CAA requires states to prepare and submit GN SIPs addressing significant contributions to downwind attainment and maintenance problems, EPA is required to promulgate FIPs as a backstop for any state that does not submit a timely SIP or submits a SIP that is disapproved by EPA. Timely and expeditious attainment in downwind states is largely dependent on securing timely reductions in transported pollution. Therefore, EPA should propose FIPs as early as possible for the 2015 NAAQS, in no case later than the GN SIP deadline of October 28, 2018. This will enable timely finalization of any necessary FIPs, which should require emission requirements to be implemented as soon as practicable, and not be extended to the moderate attainment deadline. Doing so will assist all downwind nonattainment areas with expeditiously complying with the NAAQS, regardless of their nonattainment classification.

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[5] For further explanation, see CT DEEP's comments on EPA's proposed Implementation Rule for the 2015 NAAQS at: https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2016-0202-0052&attachmentNumber=1&contentType=pdf.

[6] Delaware Register of Regulations, Vol. 16, Issue 1 at 140, Table 3-4.

[7] NJ DEP; 2009; Air Pollution Control and Prohibition of Air Pollution by Volatile Organic Compounds and Oxides of Nitrogen.

EPA Must Act to Provide a Full Remedy for the 2008 Ozone NAAQS

CT DEEP recognizes that EPA is providing these preliminary modeling results and supporting information much earlier in the implementation process for the 2015 ozone NAAQS than occurred for previous standards. CT DEEP also reminds EPA that the CSAPR Update was promulgated as only a partial remedy for transport related to the 2008 ozone NAAQS. In the preamble[8] to the final CSAPR Update rule, EPA makes the following statement:

> "Because the reductions in this action are EGU-only and because the EPA has focused the policy analysis for this action on reductions available by the beginning of the 2017 ozone season, CSAPR update reductions will represent, for most states, a first, partial step to addressing a given upwind state's significant contribution to downwind air quality impacts for the 2008 ozone NAAQS. Generally, a final determination of whether the EGU NOx reductions quantified in this rule represent a full or partial elimination of a state's good neighbor obligation for the 2008 NAAQS is subject to an evaluation of the contribution to interstate transport from non-EGUs and further EGU reductions that are achievable after 2017."

CT DEEP urges EPA to quickly complete the analyses and rulemaking needed to implement the long overdue full remedy for the 2008 NAAQS. CT DEEP expects the full remedy will require substantially greater emission reductions than provided by the CSAPR Update, which EPA estimated would improve the overwhelming level of ozone transport into Connecticut by less than 0.5 ppb. Securing such reductions will require the consideration of measures beyond the EGU sector (e.g., full installation and operation of SCR & SNCR, high demand/ozone day requirements, performance standards) to also include non-EGU point sources (e.g., ICI boilers, cement kilns), area sources (e.g., low sulfur fuel oils that provide NOx benefits) and mobile sources (e.g., tighter diesel engine standards, aftermarket catalysts). EPA should not wait to couple the full remedy for the 2008 NAAQS with actions needed to address transport for the 2015 NAAQS. Expeditious attainment of the 2008 NAAQS in Connecticut can only be achieved if a complete remedy is promulgated and implemented as soon as possible.

EPA's NODA Modeling Platform Underpredicts Measured Ozone Levels

The EPA modeling platform used for the Transport NODA incorporated Version 6.3 emission inventories for 2011 and 2023 and the Comprehensive Air Quality Model with Extensions (CAMx) v6.32 to identify receptors projected to have ozone nonattainment or maintenance problems in 2023 and to quantify state-level contributions to those receptors.[9] The platform is nearly identical to that previously used by EPA to estimate 2017 ozone design values for the CSAPR Update.[10] Ozone season monitoring data for two of the years (2015 and 2016) that will determine actual 2017 design values (DVs) are already available, so some comparison of the modeled projections to monitored values is possible. Since the procedure for determining monitored DVs is specifically designed to minimize anomalies in a particular year from having too much weight, large swings in DVs for 2017 are not expected when compared to the 2015 and 2016 values.

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[8] See page 74522 at 81 FR 74504.

[9] US EPA, "Technical Support Document (TSD) Updates to Emissions Inventories for the Version 6.3, 2011 Emissions Modeling Platform for the Year 2023," December 2016.

[10] US EPA, *Air Quality Modeling Technical Support Document for the Final Cross State Air Pollution Rule Update*, Technical Support Document, (Office of Air Quality Planning and Standards, August 2016).

Table 1 compares 2015 and preliminary 2016 monitored DVs at CT DEEP operated monitors with 2017 modeled future design values (DVFs) from EPA's CSAPR Update Rule. The differences are sizeable, with EPA's modeling projecting 2017 DVs that are 6 to 13 ppb lower than preliminary 2016 DVs at all but one monitoring site. For comparison, **Table 1** also shows 2017 DVFs predicted by the OTC with the Community Multi-Scale Air Quality (CMAQ) model, which also underpredicts the 2016 DVs, but are somewhat higher than EPA's projections, especially at Connecticut's worst-case monitors located closest to the state's upwind border in the southwest portion of the state.

Table 1: Monitored and Modeled Results at Connecticut Ozone Monitors (ppb)

State	County	Site	AQS Code	2016 DV (Prelim.)	2015 DV	2017 EPA CSAPR Update DVF[11]	2017 OTC CMAQ DVF[12]
CT	Fairfield	Westport: Sherwood Island	90019003	85	84	76	83
CT	Fairfield	Greenwich Point Park	90010017	82	81	74	77
CT	Fairfield	Stratford	90013007	81	83	75	77
CT	Middlesex	Middletown	90070007	79	80	69	70
CT	Fairfield	Danbury WCSU	90011123	78	76	71	74
CT	New Haven	New Haven: Criscuolo Park	90090027	76	76	66	67
CT	New Haven	Madison: Hammon. St Prk	90099002	76	78	76	77
CT	Hartford	E. Hartford: McAuliffe Park	90031003	75	76	65	66
CT	Litchfield	Cornwall: Mohawk Mtn	90050005	74	70	61	62
CT	Tolland	Stafford	90131001	73	76	65	67

The large underprediction by EPA's modeling platform for 2017[13] raises strong concerns that the Transport NODA, which used essentially the same modeling platform, is producing overly optimistic ozone projections for 2023 as well. Modeled underpredictions likely produce a misleading portrayal of the severity and geographic extent of ozone problems that will remain in 2023, along with the scale and breadth of upwind emission reductions that will be required to provide a full remedy for the 2015 ozone NAAQS.

The concerns regarding underprediction by EPA's modeling are exacerbated because EPA's 2023 modeling includes substantial reductions from the Clean Power Plan, which was stayed by the US Supreme Court on February 9, 2016 and was the subject of an Executive Order signed by President Trump on March 28, 2017 directing, among other things, the EPA Administrator to review the CPP. The CSAPR Update could also be in jeopardy of delays or rescission, pending possible Congressional or Executive actions.

[11] US EPA; CSAPR Update; "Data File with Ozone Design Values and Ozone Contributions"; August 2016.
[12] Ozone Transport Commission; *Technical Support Document for the 2011 Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union Modeling Platform*; OTC, November 15, 2016.
[13] Additional regional emission reductions can be expected between 2016 and 2017, but likely not enough to account for the apparent underpredictions by EPA's modeling. For example, EPA previously projected Tier 3 Motor Vehicle Emission and Fuel Standards will provide an average decrease in ozone DVs of only about 0.6 ppb by 2018 (US EPA, *Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards Final Rule*, Regulatory Impact Analysis EPA-420-R-14-005; EPA OTAQ; March 2014). As mentioned earlier, EPA projects that the CSAPR Update will provide less than a 0.5 ppb ozone relief to Connecticut in 2017.

Given the sizeable underpredictions of ozone levels produced by EPA's modeling platform, CT DEEP questions whether it is technically appropriate for states to rely on them to develop GN SIPs. At a minimum, if EPA allows states to build their SIPs based on those modeling results, EPA should not approve any GN SIP unless all modeled emission reductions are found to be federally enforceable, including reductions equivalent to those that were projected by EPA to occur from the CPP, CSAPR Update and any other federal measures that are delayed or rescinded. The approval of any such GN SIP should not just be dependent on the enforceability of those reductions from the submitting state, but also be dependent on the enforceability of the reductions in all other states that were covered by the compromised federal rules. This is crucial, because the projected ozone benefits in downwind states are reliant on the full regional emission reductions from all covered upwind states, not just those that might be made enforceable by a select group of those states.

CT DEEP encourages EPA to examine modifications to the modeling platform that could improve performance. In addition to updating projected emissions to reflect the emerging realities regarding federal control programs, CT DEEP urges EPA to address the concerns and suggestions included in the OTC Transport NODA comment letter. CT DEEP also highlights concerns below regarding the appropriateness of EGU emission projections included in EPA's modeling analysis, identifying problems that, if rectified, may help improve model performance. Ideally, EPA should issue revised modeling in time for states to include the results in their GN SIPs. EPA should also use revised modeling to develop and release a FIP proposal by no later than the October 2018 deadline for state SIP submittals.

EPA's NODA IPM Emissions Projections Can Be Improved

As discussed below, CT DEEP examined EPA's IPM projected emissions for 2023 for emission units located in Connecticut and nearby states, finding several areas of concern that should be addressed by EPA for use in future modeling.

Projection methods and data

IPM v5.16 projects that a significant number of coal and oil-fired EGUs will either retire or will not operate in 2023. The retirement and non-operation projections seem to be based mostly if not entirely on economics. CT DEEP has observed over the past several years, based on EGU operations in Connecticut and other states, that economics are not always the best indicator of future EGU operations. IPM's "blunt force" approach of retiring or not operating EGUs underrepresents trends in coal EGU gasification and the operation of coal and oil-fired EGUs as peaking units, and does not appear to take into account Independent System Operator (ISO) reliability concerns that may cause continued operation of an "uneconomic" EGU. The flawed IPM approach consequently does not adequately address important temporal impacts from increased operations of EGUs on high electricity demand days, which often occur on the worst ozone air quality days.

States have routinely lamented IPM's misguided projections in previous NODA comments, and as an alternative to IPM projections, the Eastern Regional Technical Advisory Committee (ERTAC), comprised of several states and multi-jurisdictional planning organizations, developed an EGU Forecasting Tool for use in growing EGU emissions inventories. The ERTAC EGU Forecasting Tool utilizes an EGU dataset developed and continually updated with extensive state and stakeholder feedback regarding EGU retirement, control equipment installation, and EGU operating profile information. The ERTAC EGU workgroup has also done a 2023 projection of

EGU emissions, and there are stark differences between the ERTAC EGU and IPM results. To demonstrate how the choice of projection method could potentially impact future EGU emission estimates and subsequent transport policy, **Table 2** compares coal and oil 2023 ozone season NOx emissions estimates from IPM v5.16 and ERTAC EGU v2.6. Along with Connecticut, the states of New Jersey, New York and Pennsylvania are included because those states are identified by EPA's modeling as the largest contributors to Connecticut's nonattainment and maintenance problems.

Table 2:

2023 Ozone Season NOx Emissions (tons) for Coal/Oil EGUs in ERTAC v2.6 and IPM v5.16

	Coal		**Oil**	
State	**ERTAC**	**IPM**	**ERTAC**	**IPM**
CT	95	0	38	0
NJ	987	0	28	0
NY	1113	0	258	0
PA	21961	8260	442	0
Totals	**24156**	**8260**	**766**	**0**

Table 3 compares the difference between ERTAC and IPM solely due to IPM's retirement and non-operation of coal and oil-fired EGUs in 2023 for the same states.

Table 3:

2023 Ozone Season NOx Emissions Difference (tons) between ERTAC v2.6 and IPM v5.16

State	**Difference between ERTAC and IPM due to IPM's retirement/non-operation of coal/oil-fired EGUs**
CT	134
NJ	999
NY	1285
PA	9857
Total	**12275**

The data in **Tables 2** and **3** show the disproportionate impact of IPM's retirements and non-operation of EGUs on future year emissions as compared with ERTAC, especially when you take into account the totality of emissions from multiple states. While it is likely that some of IPM's projected retirements and non-operation of EGUs will occur, it is unlikely that most or all of them will occur. For example, IPM projects that Pennsylvania's Brunner Island 1-2 and Montour 1-2 coal-fired EGUs will retire in 2023. Brunner Island 2 has recently added natural gas burning capability and Brunner Island 1 is scheduled to have natural gas burning capability added this year. The addition of natural gas burning capability is also being considered for the Montour units. B L England units 2 and 3 in New Jersey are projected to retire in 2023 in IPM, but PJM has requested that those units run beyond the planned shut-down in 2017 due to regional electric reliability concerns.

IPM's projections based on economics could prevent EPA's modeling from capturing the key temporal aspect of increased operations of EGUs, including peaking EGUs, on high electricity demand/high ozone days. The failure to adequately represent EGU operations on the worst ozone air quality days can seriously hinder attempts at addressing state transport contributions sufficiently. As a case in point, **Table 4** shows an example of NOx daily emissions from the Pennsylvania coal and oil-fired EGUs that IPM projects will retire or not operate in 2023 on two recent ozone exceedance days and two recent non-exceedance days in Connecticut.

Table 4:
NOx emissions (tpd) from IPM retired/not operated Pennsylvania coal/oil-fired EGUs in 2023

Days with an ozone exceedance in CT	**tons/day**
8/17/15	163
7/22/16	164
Days without an ozone exceedance in CT	
5/7/15	91
8/9/15	96

As evidenced in **Table 4**, there can be a discernible increase in daily NOx emissions from EGUs on ozone exceedance days, and that increase in emissions, especially when considered collectively by a group of upwind states, could be enough to "tip the scales" in terms of nonattainment for downwind states. If IPM is not capturing the temporal piece of the nonattainment puzzle, it does not seem probable that EPA can adequately assess future EGU emissions; and therefore is not likely that EPA can craft a transport remedy that will adequately address transport.

If EPA continues to use IPM as the tool for EGU inventory projections, it should undertake a thorough review of IPM assumptions related to retirement and non-operation of coal and oil-fired EGUs. EPA should true-up model performance as part of its review. Furthermore, EPA should consider how it could supplement its EGU inventory by utilizing ERTAC EGU data inputs.

<u>Projected increase in emissions from Pennsylvania's fossil units >25 MW after 2023</u>

According to *EPA's Base Case v.5.16 for 2015 Ozone NAAQS Transport NODA – State Emissions Projections – Fossil > 25 MW*[14], IPM projects that Pennsylvania's emissions from fossil units >25 MW will be 13,800 tons in 2023; then in 2025, IPM projects that Pennsylvania's emissions jump back up to 15,200 tons and stay there until approximately 2030. It does not appear that EPA accounted for this substantial increase in emissions after 2023 and the potential adverse impacts on downwind nonattainment/maintenance receptors.

EPA should analyze how the increase in Pennsylvania's projected emissions from fossil units > 25 MW after 2023 will impact downwind nonattainment/maintenance receptors, and adjust future year modeled ozone ppb values if there is a difference.

[14] See: http://www.ct.gov/deep/lib/deep/air/ozone/ozone_sip_revision/epa_base_case_v.5.16_for_2015_ozone_naaqs_transport_noda_state_emissions.xlsx

IPM treatment of Connecticut's oil-fired load following boilers and turbines

Specifically with respect to Connecticut, IPM projects that all of Connecticut's oil-fired load following EGUs and most of Connecticut's older oil-fired peaking combustion turbines will either retire or won't operate in 2023 (see **Table 5**):

Table 5: IPM retired or not operated oil-fired EGU boilers and turbines in CT

Unit ID/ORIS	**2023 Status in IPM**
Branford 10/ORIS 540	Not operated
Cos Cob 10, 11, 12, 13 and 14/ORIS 542	Not operated
Devon 10/ORIS 544	Not operated
Montville 5/ORIS 546	Retired
Montville 6/ORIS 546	Retired
Tunnel 10/ORIS 557	Not operated
Franklin Drive 10/ORIS 561	Not operated
Middletown 10/ORIS 562	Not operated
Middletown 2, 3 and 4/ORIS 562	Retired
South Meadow Station 11A, 11B, 12A, 12B, 13A, 13B, 14A and 14B/ORIS 563	Not operated
Torrington Terminal 10/ ORIS 565	Not operated
Bridgeport Harbor Station BHB4/ORIS 568	Not operated
New Haven Harbor NHB1/ORIS 6156	Retired
Waterside Power LLC 4, 5 and 7/ORIS 56189	Not operated

CT DEEP is not currently aware that any of the EGU boilers or combustion turbines in **Table 5** will retire. In addition, EPA's IPM projections do not include the CPV Towantic Energy Center,[15] an 805 megawatt natural gas fired combined cycle facility, comprised of two identical combustion turbines, currently under construction in Oxford, CT and scheduled to be on-line in 2018.

If EPA continues to use IPM as the tool for its EGU inventory projections, it should undertake a thorough review of IPM assumptions related to retirement and non-operation of coal and oil-fired EGUs. EPA should true-up model performance as part of its review. Furthermore, EPA should consider how it could supplement its EGU inventory by utilizing ERTAC EGU data inputs. EPA should also update its universe of EGU facilities, as appropriate, to include the CPV Towantic Energy Center.

[15] See: http://www.ct.gov/deep/cwp/view.asp?Q=574218&A=4707.

Projected increase in SO2 emissions from Connecticut's Municipal Waste Combustors

As shown in **Table 6**, IPM v5.16 projects that total SO2 emissions from Connecticut's Municipal Waste Combustors (MWCs) more than double in 2023 compared with 2015 actual SO2 emissions.

Table 6: 2015 Actual and 2023 Projected SO2 emissions from Connecticut's MWCs

Unit	2015 Actual SO2 (tpy)	2023 Projected SO2 (tpy)
Covanta Bristol 1, ORIS 50648	21	12
Covanta Bristol 2, ORIS 50648	12	15
Covanta Southeastern 1, ORIS 10646	12	21
Covanta Southeastern 2, ORIS 10646	14	21
Covanta Wallingford 1, ORIS 50664	0.4	0
Covanta Wallingford 2, ORIS 50664	0.4	0
Covanta Wallingford 3, ORIS 50664	0.1	0
MIRA 1, ORIS 54945	12	55
MIRA 2, ORIS 54945	9	55
MIRA 3, ORIS 54945	6	55
Wheelabrator Bridgeport 1, ORIS 50883	26	42
Wheelabrator Bridgeport 2, ORIS 50883	18	42
Wheelabrator Bridgeport 3, ORIS 50883	32	42
Wheelabrator Lisbon 1, ORIS 54758	9	16
Wheelabrator Lisbon 2, ORIS 54758	8	16
Totals	**180**	**392**

CT DEEP does not understand the basis for a projected increase in MWC SO2 emissions in 2023, especially since IPM projects a decrease in MWC NOx emissions in 2023. In addition, the Connecticut legislature enacted a 60% target rate[16] for reducing solid waste disposal by increasing source reduction, recycling, and reuse by January 1, 2024, so CT DEEP anticipates that both NOx and SO2 emissions from Connecticut's MWCs will decrease in 2023.

EPA should reassess 2023 SO2 projections for Connecticut's MWCs, and adjust such SO2 projections if warranted.

[16] See: http://www.ct.gov/deep/cwp/view.asp?a=2718&q=553470&deepNav_GID=1653.