DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION MANAGEMENT ADMINISTRATION

RESPONSE TO COMMENTS

for the

PUBLIC HEARING held on October 23, 2015
in BALTIMORE, MD
related to
the amendment of Regulation
.01, amendment and recodification of existing Regulations .04 and .05 to become
Regulations .05 and .06, and adoption of new Regulations .04 and .07
under COMAR 26.11.38 Control of NO_x Emissions from Coal-
Fired Electric Generating Units.

Purpose of Hearing: The purpose of the public hearing was to allow for public comment on the Department's proposal regarding amendments to COMAR 26.11.38 Control of NO_x Emissions from Coal-Fired Electric Generating Units.

The proposed action establishes new nitrogen oxides (NO_x) emission standards and additional monitoring and reporting requirements for coal-fired electric generating units in Maryland.

Date and Location: The public hearing was held on October 23, 2015 at 10 a.m. at the Department of the Environment, 1800 Washington Boulevard, Baltimore, Maryland 21230.

Attendance: 62 Attendees

Statement: The Department's statement was read by Joshua Shodeinde, of the Regulations Development Division of the Air and Radiation Management Administration, Department of the Environment.

Comments and Responses: Comments were received from Senator Shirley Nathan-Pulliam; Delegate Dana Stein, Margie Brassil; NRG Energy, David Cramer; International Brotherhood of Electrical Workers- Local 1900, Bill Mills and James Griffin; International Brotherhood of Electrical Workers, Lonnie Stephenson; Raven Power, Michael Powell; Sierra Club, Joshua Berman and David Smedick; Maryland Environmental Health Network, Chesapeake Climate Action Network, Maryland League of Conservation Voters, Labor Network for Sustainability, Maryland Public Health Association, Alliance of Nurses for Health Environments, Maryland Chapter of Moms Clean Air Force, Montgomery Countryside Alliance, and Midshore Riverkeeper Conservancy; Environmental Integrity Project, Leah Kelly; Interfaith Power & Light (MD, DC, NoVA), Isabel Zeitz-Moskin; The League of Women Voters of Maryland, Nancy Soreng and Barbara Schnackenberg; Climate Stewards of Greater Annapolis, Wilfred Candler; Chesapeake Climate Action Network, Jon Kenney; Maryland Environmental Health Network, Rebecca Rehr; Maryland League of Conservation Voters Education Fund, Johana Vicente; Gwen DuBois; Alfred Bartlett; Fred Kissel; Russell Donnelly; Cheryl Arney; Sabrina Fu; Lih Young; Jon Kenney; Doug Aus; Chris Yoder; Moms Clean Air Force, Theresa Reuter; Maranda Kosten; Sara Via; Jennifer Kunze; Rev. Beverly Lewis; George Alderson; Trisha Sheehan; David Rebstock; Regina Minniss; Christine Keels; Shawn Gordon; Linda Kangrga; Sue Garonzik;

Gerald E. Brockhurst; Elaine Emling; Christina Fraber.

A summary of the comments received on the Phase II regulations and the Maryland Department of the Environment's (the Department or MDE) responses are below. The Department refers to Phase I as the regulations promulgating COMAR 26.11.38, effective on 8/31/15 and requiring operation and optimization of installed pollution controls beginning in 2015. The Department refers to the currently proposed regulations (MD Register 9/18/15) as the Phase II regulations and requiring additional future actions.

COMMENT: Multiple commenters state that the Department should implement its previously adopted NO_x regulation for coal plants, which was signed and submitted for publication in the Maryland Register on January 16, 2015.

A commenter states that the Proposed NO_x Regulation is unlawful and arbitrary because the Proposed NO_x Regulation unlawfully attempts to amend or repeal the Department's prior regulation of NO_x emissions from coal-fired electric generating units without following the procedures mandated by the Maryland Administrative Procedure Act (APA). The Existing NO_x Regulation was lawfully adopted on January 16, 2015 and the notice of final action submitted to the Division of State Documents for publication in the Maryland Register. The Governor's actions to block publication of the notice of adoption were unlawful, as was the Division's failure to publish the notice of final action. Because the Existing NOx Regulation was lawfully adopted, the Department cannot now promulgate a new, weaker regulation purporting to regulate the same facilities for the same pollutant without following the APA's requirements for amendment or appeal of a regulation. The proposed promulgation fails to comply with the statutory requirements for adoption of a regulation. State Gov't § 10-125(d)(3).

RESPONSE: The Department disagrees that any legal process or requirement was violated when the notice of adoption signed January 16, 2015 was subsequently withdrawn prior to publication. The reconsideration of the December 1, 2014 proposal was made in accordance with a letter of advice from counsel to the General Assembly, issued to then-Sentator Brinkley and dated December 12, 2014. Because that review was intitiated before a notice of final adoption was published in the Maryland Register, the regulations that were proposed on December 1, 2014 did not go into effect pursuant to State Government Article § 10-117(a)(1)(i). The legality of this review is currently the subject of a lawsuit in the Circuit Court for Anne Arundel County. The parties have filed briefs on the issue and the court will ultimately render a decision on this matter.

The Department also disagrees that the proposed Phase II regulations, have been proposed in violation of the statutory requirements of the APA. The only legal citation in support of this claim is a commentor's citation to State Government Article § 10-125(d)(3), Annotated Code of Maryland. That section provides that a regulation shall be deemed invalid if a court finds that the promulgating agency failed to comply with statutory requirements for adoption of the regulation. To the contrary, the Department has complied with each of the requirements set forth in the APA for promulgation of a regulation. The proposed Phase II regulations were submitted to AELR pusuant to State Government Article § 10-110; submitted to AQCAC pursuant to Environment Article § 2-206; published in the Maryland Register pursuant to pusuant to State

Government Article § 10-112; and public notice and comment was taken pusuant to State Government Article § 10-111. No applicable requirement of the Maryland Administrative Procedure Act has been violated in proposing the current Phase II regulations.

COMMENT: Multiple commenters state that despite the Governor's request for more public input and public process, the public has been effectively shut out of the development of these new regulations.

A commenter states that MDE limited public input through late notification of important hearings, limited public comment times, and limited access to technical modeling and analysis.

RESPONSE: MDE disagrees that public input for the Phase II proposal was limited. The Phase II regulations went through all of the public process required by the State Government and Environment Articles of the Annotated Code of Maryland. The proposed Phase II regulations are an amendment of the original Phase II proposal. As such, these Phase II regulations were made in consideration of all of the information and public input received during the entire regulatory development process, which began as one commenter noted in October 2013, more than two years ago. In addition to that process, MDE presented a draft of the current Phase II regulations at a stakeholder meeting on July 28, 2015, which provided an opportunity for public comment. MDE's technical analysis of the Phase II regulations was also presented to the Maryland Air Quality Control Advisory Council (AQCAC) on August 5, 2015. The AQCAC meeting was attended by stakeholders representing affected sources, trade associations, worker's unions, environmental organizations and approximately 120 members of the general public. The proposed regulations, notice of opportunity for public comment, October 23, 2015 hearing information, and the technical support document were made available to the public on September 18, 2015 when the Phase II regulations were proposed in the Maryland Register. The Department accepted public comments on the proposed Phase II regulations and a public hearing for this action was held on October 23, 2015 at MDE headquarters.

COMMENT: Several commenters noted concern that the proposed Phase II regulations are too lenient and do not require strict emission limits compared to the regulations proposed on December 1, 2014. A commenter states the Proposed NOx Regulation is arbitrary and capricious, and inconsistent with the Department's statutory obligations because it fails to achieve the Department's stated objective of providing equal or greater public health protections to the Existing (December 1, 2014) NO_x Regulation.
Conversely, a few other commenters noted that the proposed Phase II regulations are more stringent than the December 1, 2014 proposal and that flexible options only allow operation of existing coal plants in a highly constrained manner.

RESPONSE: MDE has reviewed all of the comments and reports that were submitted. MDE disagrees that the proposed Phase II regulations are less stringent than the December 1, 2014 proposal. The following provides a summary of MDE's emergency and Phase I regulations, and a demonstration that the proposed Phase II regulations provide equal or greater public health protection than the December 1, 2014 proposal.

<u>The Emergency Regulations and Phase I Regulations</u>

All coal-fired units in Maryland installed Selective Catalytic Reduction (SCR) or Selective Non-Catalytic Reduction (SNCR) control technology to reduce NO_x emissions because of the 2006 Maryland Healthy Air Act. Due to changes in unit dispatch, MDE discovered that units were not always running their installed pollution controls, while still complying with the Healthy Air Act caps. The December 1, 2014 proposal included regulations requiring all coal-fired electric generating units (EGUs or power plants) to optimize and run their installed pollution controls every day of the ozone season.

These requirements were the only new environmental standards applicable in calendar years 2015 through 2019. The Department proposed emergency regulations to ensure identical requirements were in place so that the intended NO_x limits were in place for the 2015 ozone season, which started on May 1, 2015. Concurrently with the emergency regulations, the Department submitted regulations with the same regulatory language that followed the normal regulatory adoption process and were effective on August 31, 2015 (Phase I regulations). The regulatory language in the Phase I/Emergency regulations is identical to the 2015-2019 requirements of the December 1, 2014 proposal. Thus, there was no change of any environmental standard or public health protection for the 2015-2019 calendar years.
The emergency and Phase I regulations have already resulted in dramatic reductions of NO_x emissions from EGUs, resulting in approximately 9 tons of NO_x emission reductions per day. The Phase I regulations will continue to effectively reduce NO_x emissions into and beyond 2020. In the scheme of the State's ozone issues, a 9 ton reduction is very significant. MDE photochemical modeling estimates that the reductions from Phase I will decrease ozone levels in Maryland by about 0.5 parts per billion (ppb). This is a very large emissions reduction, which is expected to meaningfully reduce ozone levels. While Phase II provides additional important NO_x reductions, Phase I provides greater reductions, and was always anticipated to provide the large majority of ozone benefits under the December 1, 2014 proposal.

<u>Phase II Regulations</u>

The December 1, 2014 proposal included regulations requiring affected EGUs without SCR technology to comply with three regulatory options beginning in 2020. The Department's recently proposed Phase II regulations include each of the three original options, along with a fourth option. The Department's analysis, summarized below, demonstrates that the recent proposal provides an equivalent or better stringency when compared with the December 1, 2014 proposal.

Option 1

Option 1 of the December 1, 2014 proposal required an affected EGU to install SCR technology and run that equipment to achieve a NO_x emissions rate of 0.09 lbs/MMBtu on a 30 day rolling average by June 1, 2020. Option 1 of the new Phase II proposal contains an identical requirement. Thus, there was no weakening of any environmental standard or public health protection.

Option 2

Option 2 of the December 1, 2014 proposal required an affected EGU to permanently retire by June 1, 2020. Option 2 of the new Phase II proposal contains an identical requirement. Thus, there was no weakening of any environmental standard or public health protection.

Option 3

Option 3 of the December 1, 2014 proposal required an affected EGU to switch fuel permanently from coal to natural gas by June 1, 2020. Option 3 of the new Phase II proposal contains an identical requirement. Thus, there was no weakening of any environmental standard or public health protection.

Option 4

Option 4 of the new Phase II proposal is designed to drive earlier and deeper NO_x emission reductions (on both a daily and seasonal basis) than the reductions required by the December 1, 2014 proposal. If an EGU complies with Option 4, it must meet a systemwide daily cap on NOx emissions or a stringent daily NO_x emission rate. In addition to the daily limit, EGUs using Option 4 must also achieve additional "ozone season" NO_x reductions in 2016, 2018 and 2020. By 2020 all units in a system would need to comply with a 30-day systemwide rolling emissions rate of 0.09 lbs/MMBtu (the same rate required of SCR controlled units under Option 1). Under Option 4, ozone season NO_x emissions from a company's system would be reduced by an additional 40% by 2020.

- *Option 4 – Requires compliance with daily emissions limits not required by Option 1 or 3*

EGUs choosing Option 4 must meet new daily emissions limits. Specifically, Option 4 requires an owner's fleet to meet a systemwide, daily NO_x tonnage cap of 21 tons per day (tpd) or meet a systemwide NO_x emission rate of 0.13 lbs/MMBtu as a 24-hour block average on each day of the ozone season. The December 1, 2014 proposal did not include specific daily emissions limits. MDE analyses show that the rate and the cap in Option 4 are consistent with levels assuming SCR controls on all units, as discussed below.

- *The 21 tons per day cap is more restrictive than Option 1 or 3*

In conducting its analysis, MDE considered each unit's potential-to-emit (PTE), as limited by the requirements of the December 1, 2014 proposal. PTE is a term used in the federal Clean Air Act which refers to the highest amount of pollutants that a source could release into the air (even if it has never actually emitted the highest amount previously). PTE requires consideration of a facility's maximum capacity given equipment design and a 24 hour/ 7 day a week operating schedule (unless federally enforceable operating limits apply).

MDE analyzed each affected unit's PTE under the December 1, 2014 proposal, consistent with federal Clean Air Act requirements regarding facility modifications. MDE believes a PTE analysis to be further justified because PJM Interconnection, the regional grid operator, may dispatch the affected EGUs in a manner which differs from dispatch profiles in previous years.

The State saw an example of this in 2010, when PJM changed the historic dispatch profiles of the coal-fired units affected by the current proposal. Because PJM could increase EGU dispatch, consideration of PTE, as restricted by the limits in the December 1, 2014 proposal, is the most reasonable and appropriate way to compare the legally permissible emissions under each proposal.

As further explained in the technical support document (TSD), which is available on the Department's website, a 21 tpd tonnage cap is approximately equivalent to each EGU's PTE where each unit in a system installed and operated an SCR to meet a daily emissions rate of 0.07 lbs/MMBtu. A 0.07 lbs/MMBtu emissions rate not only represents the rate of a very high performing SCR, but is more stringent than the 0.09 lbs/MMBtu 30-day rolling average emissions rate permitted under Option 1. Under Option 1, the allowable PTE for the NRG and the Raven/Talen systems would be 26.06 and 27.81 respectively. The 21 tpd systemwide emissions cap represents a lower PTE on peak days than the allowable emissions had each unit in a system chosen Option 1. Therefore, Option 4 is more protective of public health than the December 1, 2014 proposal.

Similarly, the PTE for the NRG and the Raven/Talen systems would be 31.87 and 32.86 respectively under Option 3 (convert to natural gas). MDE's analysis of this option assumes units converted to natural gas would operate at 0.15 lbs/MMBtu of NO_x emissions. This rate is based on an average lowest achievable rate of EGUs that underwent natural gas retrofits, as compiled by the Eastern Regional Technical Advisory Committee (ERTAC). The 0.15 lbs/MMBtu rate is significantly lower than the rate that NRG and Raven/Talen believe is achievable for a natural gas retrofit for their units with SNCR controls. The 21 tpd systemwide emissions cap represents a lower PTE on peak days than the allowable emissions had each unit in a system chosen Option 3. Therefore, Option 4 is more protective of public health than the December 1, 2014 proposal.

- *The 0.13 lbs/MMBtu 24-hour average rate provides a stringent limit to daily emission not provided by Option 1 or 3*

The Department selected a 0.13 lbs/MMBtu NO_x emission rate based upon recommendations from the Ozone Transport Commission (OTC) and the two toughest similar regulations in the East (New Jersey and Delaware). The OTC, New Jersey, and Delaware limits are based upon rates that reflect SCR levels of control. OTC recommends an emissions rate of 0.125 to 0.15 lbs/MMBtu as a 24-hour average for coal-fired EGUs like those in Maryland. Delaware's rate for coal-fired EGUs like those in Maryland is 0.125 lbs/MMBtu as a 24-hour average. New Jersey's rate for coal-fired EGUs like those in Maryland is 0.15 lbs/MMBtu as a 24-hour average.

The OTC recommendations and the Delaware and New Jersey regulations are unit specific and allow for exemptions (i.e. higher emissions rates when units are starting up or shutting down or operating at low capacity). Because the daily emissions rate (and 21 tpd cap) does not provide exemptions for start up, shut down, or low capacity operations, the Department believes Option 4 provides greater public health benefits than similar regulations and OTC recommendations contemplating SCR controls. Because Option 1and 3 do not provide a specific 24 hour average

NO_x emissions rate, the Department believes Option 4 is more protective of public health than the December 1, 2014 proposal.

• *The additional emissions reductions in 2016, 2018 and 2020 that are required if Option 4 is chosen provide additional NO_x reductions and result in earlier and better public health protection than the December 1, 2014 proposal*

In addition to the daily NO_x emissions limits, Option 4 also requires all units in the system to incrementally reduce NO_x emissions in earlier ozone seasons. These additional reductions will provide important additional public health protection.

Specifically, under Option 4 all units in a company's system must meet increasingly more stringent 30-day systemwide rolling average NO_x emission rates in 2016, 2018 and 2020, until the same thirty-day average rate as the SCR rate in Option 1 (0.09 lbs/MMBtu) is attained. Specifically, Option 4 requires each company's system to meet a 30-day systemwide rolling average NO_x emissions rate of 0.13 lbs/MMBtu beginning May 1, 2016; a 30-day systemwide rolling average NO_x emission rate of 0.11 lbs/MMBtu beginning May 1, 2018; and ultimately achieving a 30-day rolling average NO_x emission rate of 0.09 lbs/MMBtu by May 1, 2020.

The Option 4 requirements for incrementally more stringent 30-day rolling average rates will result in additional ozone season NO_x reductions from a company's system of approximately 13% in 2016, 27% in 2018 and 40% in 2020. Owners will need to make early investments to meet these new 30-day systemwide NOx rate reductions. Without Option 4, the allowable 30-day systemwide rolling average NO_x emission rate from Phase I of the regulation is 0.15 lbs/MMBtu during the 2016-2019 ozone season. Thus, if Option 4 is selected, the new Phase II proposal will provide additional NO_x reductions four years earlier than the December 2014 proposal. Therefore, Option 4 is more protective of public health than the December 1, 2014 proposal.

• *The 0.09 lbs/MMBtu 30-day rolling average rate required in 2020 if Option 4 is chosen compares to the emissions rate in Option 1*

Option 4 requires continuous compliance with a systemwide NO_x emissions rate of 0.09 lbs/MMBtu on a 30 day rolling average in 2020. It is important to recognize that this rate is comparable to selecting Option 1, where a unit installs SCR and meets the provided emissions limit of 0.09 lbs/MMBtu on a 30-day rolling average basis. Therefore, Option 4 requires compliance with the same emissions rate as if each unit in an owner's system had installed SCR technology pursuant to Option 1.

Generally, Option 4 provides a company with the flexibility to find the most cost-effective approach to meeting a rate consistent with SCR level controls without mandating a specific technology. Because all emissions are measured using Continuous Emissions Monitors, there is absolute certainty that the emission rates are met, even with a flexible approach for defining how the reductions are to be achieved. On this basis alone, Option 4 should be considered equivalent to the December 1, 2014 proposal.

• *Photochemical Modeling performed by MDE shows that Option 4 will result in greater ozone reductions than the December 1, 2014 proposal*

The Department has conducted photochemical modeling demonstrating that the daily limits and the additional early NO_x reductions of Option 4 will result in lower ozone levels than the December 1, 2014 proposal. These earlier and greater ozone reductions and public health protections are modest compared to other strategies included in the State ozone plan, but, none the less, are greater than those achieved from the December 1, 2014 proposal.

The Department's modeling shows that Option 4 will bring ozone levels down to 70.102 ppb in 2020 in Baltimore while the December 1, 2014 proposal would only bring ozone down to 70.136 ppb. The highest reading monitor in Maryland at this time is the Fair Hill monitor. Option 4 is predicted to bring ozone levels at Fair Hill down to 71.983 ppb in 2020 compared to 72.06 ppb in 2020 from the December 1, 2014 proposal.

Because Option 4 also requires earlier NO_x reductions in 2016, 2018, and 2020, MDEs modeling shows reduced ozone and public health protections earlier. For example, in 2018, when a company's system would need to meet a 0.11 lbs/MMBtu 30-day rolling average rate if Option 4 is chosen to comply, additional reduced ozone benefits of 0.06 ppb (Baltimore) and 0.097 ppb (Fair Hill) are projected. Thus, the photochemical modeling shows that Option 4 offers both earlier and more public health protection than the December 1, 2014 proposal.

As discussed earlier, these additional reductions from the new Phase II proposal provide small, but meaningful ozone benefits that will allow the State to continue to make progress on ozone air pollution. However, there are other measures in the MDE ozone plan that will provide significantly greater ozone benefit than the Phase II requirements. For example, Phase I of the NOx regulation is expected to provide an approximate 0.5 ppb reduced ozone benefit in 2018. The two most significant new ozone reducing measures in Maryland's plan are the new clean fuel requirements (Tier 3 Vehicle and Fuel Standard) and the MDE efforts to compel power plants in upwind states to implement programs similar to the MDE Phase I requirements. MDE modeling shows that Tier 3 will generate an approximate 1 ppb ozone benefit in Maryland by 2018. Efforts to compel optimization of control technology at upwind power plants by 2018 could generate up to an additional 2 ppb reduced ozone benefit.

A more thorough explanation of the Department's technical analysis of the proposed Phase II regulations is detailed in the Technical Support Document, which is available on MDE's website at http://www.mde.state.md.us/programs/regulations/air/Pages/reqcomments.aspx.

COMMENT: A commenter states that despite the Governor's promise that the Department of the Environment would move forward with regulations that provide equal or greater public health protections, the new draft regulations are far less protective and would allow a significant increase in pollution on the worst air quality days.

A commenter does not support fleetwide average emission limits. The most poorly controlled coal units in Maryland emit NO_x at rates 10 times those of the best controlled coal plants.

By failing to require more than half of the units in the State (seven of 13) to modernize their emission controls or repower to a cleaner fuel, the Proposed NOx Regulation would result in significantly higher NOx emissions on peak days.

A commenter provided a report which disputes MDE's estimates for future reductions in NO_x mass. The report concludes that the proposed regulation is expected to result in 21-35% higher NO_x emissions from Maryland coal plants on peak days than would compliance with the December 2014 regulation. This report asserts that the Department's analysis inappropriately inflates potential emissions by using maximum capacity factors rather than recent past capacity usage. In addition, the report states that, although the Department's analysis purported to evaluate a range of compliance scenarios, in each scenario the Department assumed emission rates that are inconsistent with existing Phase I regulatory requirements. This report calculated peak daily emissions for each unit repowered with natural gas on a conservative emission rate of 0.12 lbs/MMBtu.

RESPONSE: The Department disagrees with the commenter's estimates of a 21-35% emissions increase from the proposed December 1, 2014 proposal. The Department's analyses, which are based upon potential to emit (PTE), have shown that the proposed regulations are 35% more stringent for the NRG energy system and 36% more stringent for the Talen/Raven system compared to the December 1, 2014 proposal.

The Department believes the estimates provided by the commenter are inaccurate as they are not based upon PTE. They are also inaccurate because they assume EGUs would not be implementing strategies to comply with Option 4. EGUs will need to implement strategies to comply with Option 4, these strategies include: temporary use of natural gas, limited use of selected units, and a broad array of other strategies.

In addition, the estimates provided by the commenter were based upon ozone seasons with low electricity demand. Using ozone seasons with low demand is inconsistent with the overarching purpose of the Phase II regulations, which is to limit emissions during peak days during ozone seasons with high demand.

The Department also disagrees with the commenter's use of emissions rates that are lower than the indicator rates in Phase I. The existing Phase I regulations require units to operate and optimize their installed pollution controls. Phase I includes an optimization indicator rate for Morgantown units 1 and 2 of 0.07 lbs/MMBtu on a 24-hour block average. Thus, the Department's use of a 0.07 lbs/MMBtu (which is consistent with an extremely well operated SCR) is appropriate, reasonable, and consistent with current regulation. To the contrary, the commenter criticizes the Department's use of a 0.07 lbs/MMBtu rate. The report that is quoted by the commenter lowers Morgantown unit(s) below a 0.07 lbs/MMBtu rate to achieve more than 30% daily NO_x reductions. .

The Department also disagrees with the commenter's use of a 0.12 lbs/MMBtu emissions rate for units converting to natural gas. It is unclear what basis was used to select this rate. To the contrary, the Department selected a rate of 0.15 lbs/MMBtu based on an average lowest achievable rate of EGUs that underwent natural gas retrofits, as compiled by the Eastern Regional Technical Advisory Committee (ERTAC). As this is the average rate demonstrated by

units that have actually undergone natural gas retrofits, and because the rate is within the EPA's suggested rate of 0.1 to 0.2 lbs/MMBtu, the Department's analysis using a 0.15 lbs/MMBtu rate is the most reasonable and appropriate rate to use for comparison.

COMMENT: Some commenters state that the proposed regulation is equal to or more stringent than the previously proposed regulations from December 2014. A commenter states that the regulation will be a challenge to meet and explained that Maryland power plants have reduced NO_x emissions by 75% since 2002. A commenter states that without the flexibility of Option 4 from the proposed regulation, coal plants might be forced to premature shut downs.

A commenter provided a report which concurs with MDE's estimates for future reductions in NO_x mass and adds that the addition of a systemwide 24-hour rate or cap with a 30-day rate will provide emission reductions.

RESPONSE: MDE agrees that much progress has been made in pollution reductions from power plants. The proposed Phase II regulations will provide modest, but meaningful additional ozone reductions and provide stringent compliance measures.

COMMENT: A commenter states that it is important to remember that the majority of the environmental benefits from this regulation come from the portions that went into effect this past summer. As a result, the 2020 NO_x restrictions proposed in COMAR 26.11.38 are only a small piece of Maryland's strategy to reduce ozone levels.

A commenter states that the federal government recently lowered the National Ambient Air Quality Standard (NAAQS) for ground-level ozone pollution to 70 ppb averaged over an 8-hour period, to better reflect scientific data showing that lower ozone levels have negative impacts on lung function. Our state's plan for lowering NO_x emissions should not be rolled back while our communities still live with very real air quality problems.

A commenter suggests that mobile sources and upwind transport from other states are now by far the largest sources of ambient ozone in Maryland.

RESPONSE: This action is part of a series of initiatives that will allow Maryland to attain and maintain compliance with the current health-based federal standard for ozone pollution. This year, the EPA found that the metropolitan Baltimore area is meeting the health-based federal standard for ground-level ozone. See 80 Fed. Reg. 30,941 (June 1, 2015). On August 19, 2015, EPA proposed a 1-year extension for the Maryland portion of two multi-state nonattainment areas (Washington, DC and Philadelphia). MDE's monitoring data from the summer of 2015 shows that every single monitor in Maryland is recording ozone levels below the 75 ppb standard. This means that for the first time in over 30 years, Maryland is able to demonstrate that the State is meeting the 75 ppb ozone standard statewide.

On October 1, 2015, EPA adopted a more stringent ozone standard of 70 ppb. Efforts to comply with this standard will begin in 2017, when EPA designates areas that measure levels above the new standard as "nonattainment". Depending on the classification of the non-attainment areas, the areas will be required to come into compliance in approximately the 2020 to 2025 timeframe. Maryland is extremely close to meeting the new EPA standard in 2015. Fifteen of the State's

eighteen ozone monitors are already below the new standard of 70 ppb. The three monitors that are currently measuring levels above the new standard (Baltimore County, Harford County and Cecil County) have key ozone values of 71 ppb, 71 ppb and 73 ppb respectively.

Despite Maryland's near attainment, MDE agrees that EPA's new ozone standard will continue to push Maryland to find new ways to reduce NO_x emissions. MDE believes that our current ozone plan will continue to reduce ozone levels and that by 2017 the remaining three monitors will have data to demonstrate that they are below the 70 ppb standard. As previously discussed, the early reductions of Option 4 under the new Phase II proposal have been modeled to show that they will provide small, but meaningful additional emissions reductions over the December 1, 2014 proposal, which could impact attainment in the State. The Department believes that Option 4 is equivalent to or more protective than the December 1, 2014 proposal, as discussed above.

The Phase II proposal is one element of the State plan to reduce ozone. MDE agrees that there are other measures in the MDE ozone plan that will provide greater ozone benefit than the Phase II requirements. For example, Phase I of the NOx regulation is expected to provide an approximate 0.5 ppb reduced ozone benefit in 2018. The two most significant new ozone reducing measures in Maryland's plan are the new clean fuel requirements (Tier 3 Vehicle and Fuel Standard) and the MDE efforts to compel power plants in upwind states to implement programs similar to the MDE Phase I requirements. MDE modeling shows that Tier 3 will generate an approximate 1 ppb ozone benefit in Maryland by 2018. Maryland and EPA's efforts to reduce ozone transport from upwind power plants, including efforts under the Clean Air Act "Good Neighbor" plans due in late 2017,could generate up to an additional 2 ppb reduced ozone benefit by 2018.

COMMENT: A commenter states that nitrogen dioxide (NO2) is an important cause of morbidity and mortality in the Baltimore area. The commenter adds that nitrogen dioxide is an important component of secondary fine particulate matter and in the formation of ozone pollution.

A commenter expressed concern on the effects of ozone and NO_x on residents in Baltimore. The commenter states that Baltimore City's hospital emergency room visits are almost three times the average rate of the State.

Multiple commenters state that it is an issue of justice/fairness to protect vulnerable populations affected by NO_x including young children, the elderly, and asthmatics in various communities.

RESPONSE: The Department and the EPA have reviewed extensive research associating ozone exposure with adverse health effects in numerous toxicological, clinical and epidemiological studies. Reducing ozone concentrations is associated with significant human health benefits, including the avoidance of mortality and respiratory illnesses. These health benefits include fewer asthma attacks, hospital and emergency room visits, lost work and school days, and lower premature mortality.

The EPA first set standards for NO2 in 1971, setting both a primary and secondary standard at 53 ppb, averaged annually. In January 2010, the EPA established an additional primary standard at

100 ppb, averaged over one hour. Maryland complies with the NO2 health-based standard. All areas of Maryland comply with the fine particle standard.

The proposed Phase II regulations will further reduce NO_x emissions and provide public health benefits. Reducing NO_x emissions will also reduce adverse health effects associated with NO2 exposure. Additionally, the Department has formed a workgroup to discuss cumulative impacts and address issues of environmental justice.

Maryland is not only in compliance with the current NO2 standards, but the levels of ozone in the Baltimore and Washington areas have been reduced significantly in the past few decades. The geographic extent of areas actually experiencing levels of ozone above the 2008 standard has been reduced significantly.

COMMENT: A commenter states that the failure of power companies to invest in modern SCR technology shifts the financial burden of NO_x health effects to patients and taxpayers.

A commenter states that the public is told that dirty energy is cheap, but we pay every day for dirty energy. We pay in hospital bills, in inhalers, in our health.

RESPONSE: The new Phase II proposal provides public health protections while supporting the economy and protecting jobs. The following describes the health benefits of the new Phase II proposal and analysis of potential compliance costs for affected sources.

Implementation of these regulations will result in reduced ozone levels thereby reducing the adverse health impacts experienced by many Marylanders caused by exposure to high levels of ozone. These benefits include a lower incidence of hospitalizations, respiratory illnesses, and restricted activity days. Health benefits are influenced by many factors and monetizing benefits is difficult. Ozone season economic benefits from reduced incidents range from $60,000—$300,000,000 (in 2010 dollars).

As described above, the new regulation provides four options from which affected sources may choose to achieve compliance with the 2020 requirements. Under the first option for 2020 compliance, units currently equipped with SNCR or SACR control technologies could remove and replace those technologies with the more advanced SCR technology. Installation of state-of-the-art SCR controls on a unit can cost up to $200 million. The performance and removal efficiency of the controls at a specific unit can depend in part on how much the unit operates.

The second option is retirement of the unit(s). Many of the units subject to this regulation were built in the 1950's and are less efficient than modern units. Some of these units may simply be reaching the end of their ability to efficiently produce energy and the costs associated with fuel switching or installation and operation of advanced NOx controls would not be cost-effective.

Under the third compliance option, affected units could convert to natural gas. The installed cost of a new natural gas combined cycle unit is approximately $1,000,000 per megawatt of capacity. Retrofitting a coal boiler to burn natural gas has variable costs. The availability of natural gas,

site specific constraints and market fuel prices will factor into decisions about selection of this option.

Under the fourth option, affected generating units must meet more stringent NOx 30-day systemwide rolling average rates in 2016, 2018 and 2020 than those currently required by Regulation .03B(1) of this chapter. Meeting these more stringent NOx 30-day systemwide rolling average rates will result in lost revenue. Affected units must also choose between meeting a 24-hour systemwide NOx emission rate or a systemwide daily NOx tonnage cap in 2020. This will be done through averaging and operation curtailment resulting in lost revenue. The Department is unable to estimate the lost revenue at this time.

COMMENT: Nitrogen deposition in the Chesapeake Bay is largely contributed from coal plant air pollution and the State must act to address NO_x pollution in the Bay.

RESPONSE: The Department agrees that NO_x deposition into the Chesapeake Bay is an important issue that needs to be addressed. More than one-third of the nitrogen pollution entering the Chesapeake Bay comes from the air. Pollutants released into the air (primarily from power plants and vehicle emissions) eventually make their way back down to the earth's surface and are dispersed onto the land and transported into waterways.

Computer model estimates from the Chesapeake Bay Program show that air pollution controls have reduced the amount of nitrogen entering the Chesapeake by 10 percent since 1985, a reduction that accounts for about a third of all estimated nitrogen reductions achieved to date. State and federal regulations that have focused on reducing NO_x emissions, as well as decades of enforcement actions, have led to the steady decline in air pollution that affects the Bay region. In addition to other State and federal regulations currently in effect, the standards and requirements in the proposed Phase II regulations will further reduce the amount of nitrogen entering the Bay each year.
MDE disagrees that nitrogen deposition in the Chesapeake Bay is largely contributed from coal-fired power plant air pollution. Emission inventories demonstrate that mobile sources are the largest contributor to nitrogen deposition in the Bay.

COMMENT: Several commenters stated that the proposed Phase II regulations will help meet air quality objectives while protecting the loss of jobs at utilities. Had the proposed regulations been any more stringent they would have jeopardized the jobs of up to 250 workers in the electrical and utility fields.

RESPONSE: The Department agrees that the proposed Phase II regulations provide flexibility to affected sources in meeting stringent air quality standards that provide public health protection while supporting a healthy economy and protecting jobs.

COMMENT: The proposed Phase II regulation provides flexibility needed to ensure electric grid reliability in Maryland. Further tightening of this regulation could result in premature plant shutdowns and the importing of electricity from less-controlled out of state sources.

RESPONSE: The Department agrees that Phase II regulations include provisions to ensure that the reliability of the electrical system is maintained during the ozone season after 2020. The electricity grid in Maryland is well supported and includes adequate backup generation for high energy demand days. In rare instances, the regional grid operator, PJM Interconnection, may issue emergency warnings or actions to ensure electrical reliability. Historically, emergency calls have been limited, occurring on just 3 days during the 2012 and 2 days during the 2013 ozone seasons. MDE and the Maryland Public Service Commission (PSC) expect such emergency calls to be reduced by 2020. Four new natural gas fired EGUs are scheduled for construction and operation in Maryland before 2020, and PJM has committed to making system upgrades which will likely limit the need for future emergency calls by 2020.

COMMENT: Several commenters stated that coal as an energy source is antiquated and needs to be phased out and replaced with cleaner, renewable energy sources.

RESPONSE: The Department supports a diverse, but well-controlled, electricity generating fleet. The proposed Phase II regulation does not eliminate coal-fired generation in Maryland, but ensures that all coal-fired EGUs are controlled with modern pollution control equipment and required to minimize emissions at all times during the summer ozone season. These requirements ensure that EGUs are meeting some of the most stringent emission standards in the country.

The Department acknowledges that as EGUs age, they often become costlier to maintain and less efficient. PJM Interconnection, which is responsible for electrical dispatch and protecting grid reliability, projects at least 16,000 megawatts (MW) of power in the region will be lost through 2021 resulting from the retirement of old coal units.

Natural gas has often been the fuel of choice for meeting intermediate or shoulder loads because it has been slightly more expensive than coal, but cheaper than petroleum. While there is currently enough capacity with coal-fired EGUs to meet electricity demand, the expansion of the natural gas industry in the last few years has resulted in an increase in the contribution of natural gas to total electricity generation in the United States. Depending on the price of natural gas coupled with sufficient natural gas reserves and pipelines, Maryland could increase the utilization of natural gas as a fuel through encouraging the development of natural gas combined cycle (NGCC) plants, liquefied natural gas (LNG) facilities, and transmission pipelines. Because NGCC plants are highly advanced and very efficient (fuel efficiencies can approach 60 percent), these plants can often run as a base load power plant.

There are considerable new generating assets in various phases of permitting or construction both in Maryland and Virginia. PJM's interconnection queue shows 2,677 MWs of natural gas "under construction," with expected online dates in the 4th quarter of 2015 (230 MW Perryman expansion), the 2nd quarter of 2016 (725 MW CPV in Charles County, MD and 735 MW Keys Energy in Prince George's County, MD), the 2nd quarter of 2017 (46 MW ODEC in Cecil County, MD) and the 2nd quarter of 2018 (942 MW ODEC and 45 MW Keys Energy).

The Maryland Energy Administration has established the Renewable Portfolio Standard which is helping move Maryland toward 20% renewable energy production by 2022, through programs

that offset the cost of installing solar, wind, geothermal heating and cooling, and other renewable energy systems.