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From: William O'Sullivan <billjosullivan@gmail.com>
Sent: Thursday, July 18, 2019 4:42 PM
To: Ozone Transport
Subject: OTC Notice of Comment and Hearing on Maryland Petition for daily NOx limits at Pennsylvania coal fired power plants

As a former NJ air director, I welcome the opportunity to comment on the petition to regulate NOx emissions based on daily emission limits. I have considerable experience with regulation of NOx emissions from power plants.

1. I strongly agree that daily limits on NOx emissions from power plants are necessary and appropriate to attain and maintain the ozone health standards. NJ and several other states in the OTC already have daily NOx limits during the ozone season.
2. Daily NOx emission limits should not be limited to coal fired power plants. Coal, oil and gas combustion at all power plants should have short averaging time limits on NOx, with compliance averaging times no greater than daily (24 hours). This is especially important for high NOx emitting peaking units that operate during hot summer days when ozone is high. This would be consistent with OTC efforts to develop High Electric Demand Day (HEDD) strategies and regulations across the OTC.
3. Daily NOx limits on power plants should not be restricted to Penn. The entire OTC (and elsewhere) should have daily or shorter averaging time for NOx limits during the ozone season. A major challenge for clean air today concerns exposure to high concentrations of air contaminants for short time frames, from 1 hour to 24 hours. National Ambient Air Quality Standards (NAAQS) that are, or may be, exceeded, include ozone (8 hour average), nitrogen dioxide (1 hour average), and fine particles (24 hour average). NOx emissions contribute to the formation of all 3 of these air pollutants. Our ambient monitoring has limited coverage, so we do not know the extent of local high concentrations of these pollutants. This is especially true for the 1 hour NO2 NAAQS, which may be exceeded by peaking gas and oil fired turbines or boilers with relatively short stacks. An advantage to daily NOx limits to address regional ozone is that such limits can also address high NO2 concentrations near the peaking units. .
4. NOx limits can be input or output based. Input limits are typically in units of lb/million btu. Output limits are typically in units of lb/MWhr. Both are effective at limiting NOx emissions if the averaging time is reasonably consistent with the NAAQS health standards. A lb/MWhr output based limit has the advantage of promoting energy efficiency. A 24 hour daily lb/million btu determination sums the lbs of NOx emitted by a unit during a day and divides by the sum of the heat input to the unit in btus during that day. An output based determination sums the lbs of NOx emitted during the day and divides by the sum of the MWhrs produced during that day. For a lb/MWhr output based standard, an alternative limit may be required for times when a unit is heating up and not producing electricity.
5. The technical details of short averaging time NOx limits have been demonstrated by many states. The policy issue ripe for the OTC and other states is the future of remaining high NOx emitting power plants that contribute to ozone, NO2 and fine particle formation over time periods from 1 hour to 24 hours. It should be clear that the old inefficient and high NOx emitting power plants, whether they be coal, oil, or gas fired, should be replaced with low or no NOx electric generation units. New natural gas combined cycle (NGCC) power plants emit about 1% of the NOx as an old uncontrolled boiler or turbine. New natural gas simple cycle units emit about 2% of the NOx as old uncontrolled units. Renewable electric generation emits no direct NOx emissions. .Hence, replacing old fossil fuel units with new natural gas fired and renewable energy electric generation units would remove power plants as a significant contributor to ozone and nitrogen oxide air pollution. Setting daily NOx emission limits would expedite that transition, as it has already done in NJ.
6. Pennsylvania has done a remarkable job reducing NOx emissions from its power plants over the last 10 years. However, the remaining old fossil fuel power plants in Pennsylvania and elsewhere still contribute significantly to

high ozone levels in the OTC. Therefore, it is appropriate for Pennsylvania and other states to take additional steps to minimize NOx emissions and ambient concentrations throughout the OTC and elsewhere.

7. The time for transition to new gas and renewables should be as soon as reasonably possible, no more than 6 years, which was the NJ final compliance deadline, with interim steps. This would address fossil power plant contribution to the public health problem of ozone and nitrogen dioxide. Transition to new gas fired units would also serve to significantly reduce CO2 emissions from power plants over this relatively short time frame. Early reduction of CO2 is important. Over the longer term (2030 to 2050), gas use for power can be reduced, based on economics and regulation, as renewables and energy efficiency increase over time.. In the meantime, perpetuating old high emitting and inefficient fossil fuel fired electric units should be avoided.