Maryland
Department of
the Environment

Maryland Clean Air

2017 Progress Report

In 2016, it was hot. Really hot. Maryland experienced the sixth-warmest summer ever recorded. Despite that type of weather -- which usually ushers in high levels of air pollution because of increased electricity generation and the hot sun's effect on pollutants -- Maryland continued to make dramatic progress in cleaning up the air. Fine particulate air pollution is now so low that Maryland is meeting all federal health-based standards statewide. Even better news: fine particulate levels continue to drop every year because of state and federal regulations and other changes in the energy generation sector.

Ground level ozone, or smog, has been Maryland's most challenging air pollution problem for the past 30 years. Maryland's problem was so challenging that, for the 2008 ozone standard, the U.S. Environmental Protection Agency (EPA) designated Maryland as having the worst ozone anywhere east of the Mississippi.

That has all changed. In 2016, the Baltimore and Washington, D.C. ozone nonattainment areas continued to meet the 2008 health-based ozone standard, and are extremely close to meeting the new, more-stringent, 2015 ozone standard that begins to be implemented in late 2017. The other ozone area that Maryland is part of is the Wilmington-Philadelphia area, which includes Cecil County. Ozone in this area is slightly higher, but the area continues to see lower ozone levels each year, is very close to meeting the 2008 standard and is working to meet the 2015 ozone standard.

Maryland's more stringent requirements for coal-fired power plants were in effect during the summer of 2016 and significantly reduced emissions of nitrogen oxides (NO_x), a compound that helps form ozone. The summers of 2013-2015 were much cooler than last year's. While the hotter weather in 2016 inevitably led to an increase in ozone, the number of bad air days, the number of hours of bad air on those days, the daily peak and the geographic expanse of bad air on those days were all less than what was seen during hot summers at the start of the decade. The more stringent power plant regulations effectively reduced up to 12 tons of NO_x per day in the summer of 2016. This is strong evidence that Maryland's programs are working to clean the air.

"We're making clean air progress with strong partnerships and steady investments but more is needed regionally and nationally to sustain our pace and protect our health. Marylanders' hearts, lungs, and bays will benefit from smart actions at home and in upwind states to keep improving our air quality."

Maryland Department of the Environment Secretary Ben Grumbles

In 2010, a new health-based standard for sulfur dioxide (SO_2) was finalized. In 2016, the EPA identified a small area in Anne Arundel and Baltimore Counties as potentially not meeting this new standard. Existing monitoring for SO_2 shows dramatic downward trends in ambient levels at the two current monitors in the State. Levels at those monitors, in 2016, were well below the new SO_2 standard. EPA's decision for Anne Arundel and Baltimore Counties was based upon an air quality model, as the EPA chose to not install a monitor to measure actual levels in the area. Air quality models use computers to estimate the relationship between sources of pollution and their effects on ambient air quality. Additional modeling, reflecting actual operating conditions, shows that the area in question is meeting the new SO_2 standard.

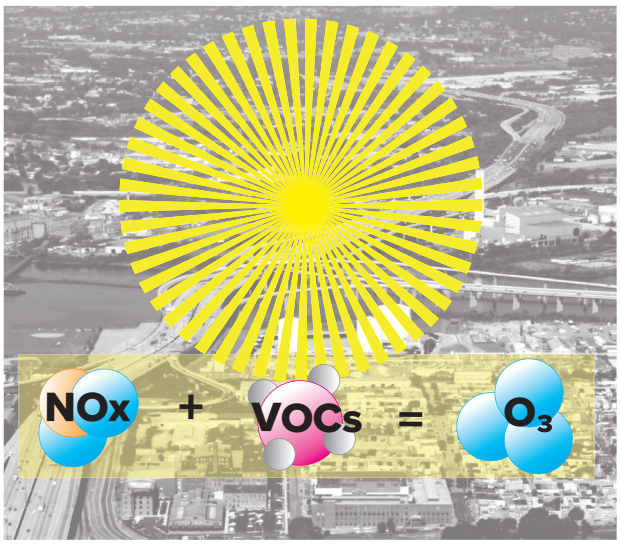
Maryland is working with the local community and EPA to install an SO_2 monitor that will more accurately demonstrate whether there is an issue with SO_2 in the area. Maryland is being proactive to protect public health and has already begun to implement new control measures to further reduce SO_2 emissions.

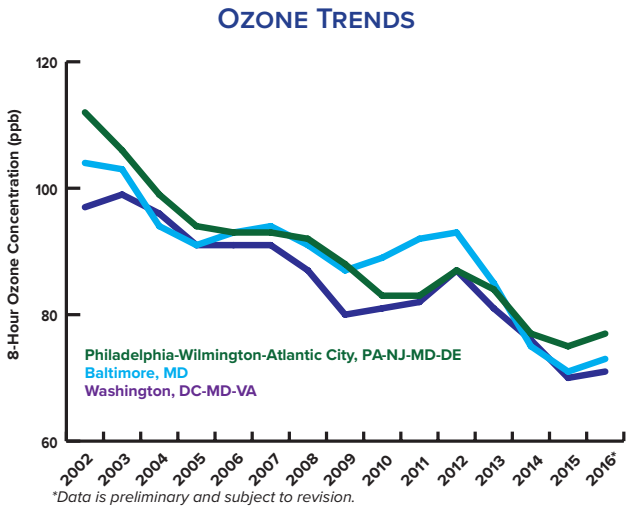
2016 also marked the first year of implementation for the Greenhouse Gas Emission Reduction Act of 2016. This law requires the State to develop and implement a plan to reduce greenhouse gas emissions by 40 percent by 2030. Greenhouse gas emissions are linked to climate change and sea level rise, and Maryland is highly vulnerable to floods and rising water. This law builds from the 2006 law that required a 25 percent reduction in greenhouse gas emissions by 2020, which Maryland is on track to achieve.

Improvements in Air Quality - By The Numbers

Ozone

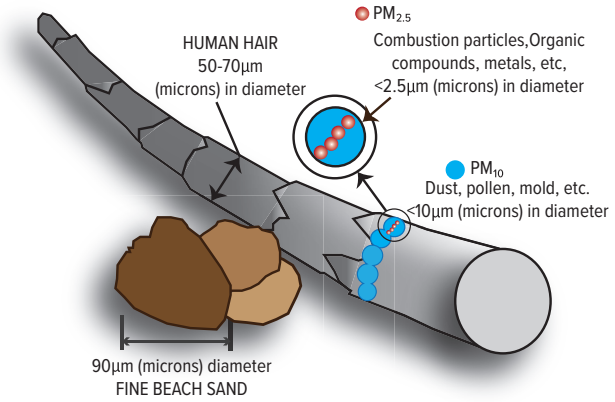
Ground level ozone is a pollutant that forms under hot and sunny conditions as oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) undergo chemical reactions. Ozone can cause the muscles in the airways to constrict, trapping air in the alveoli. This leads to wheezing and shortness of breath. Long-term exposure to ozone is linked to aggravation of asthma, and is likely to be one of many causes of asthma development. Long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children.

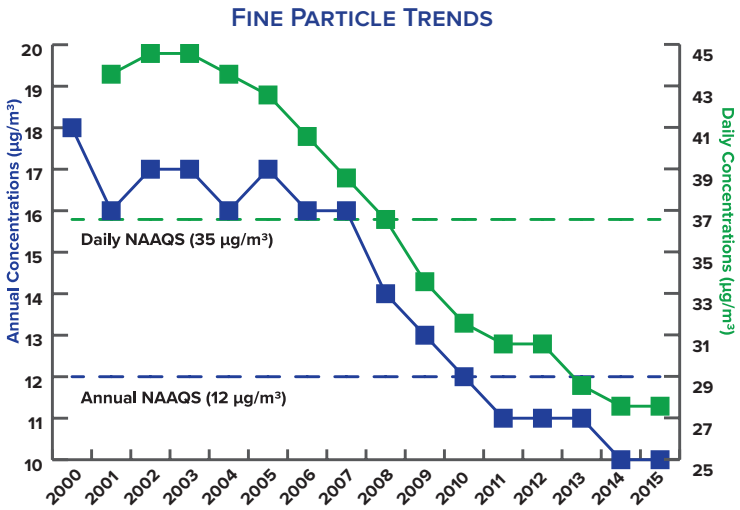




Particles

Particle pollution is a mixture of microscopic solids and liquid droplets suspended in air. High levels of particles in the air can affect our lungs and heart and have been shown to trigger asthma and heart attacks among other health problems.

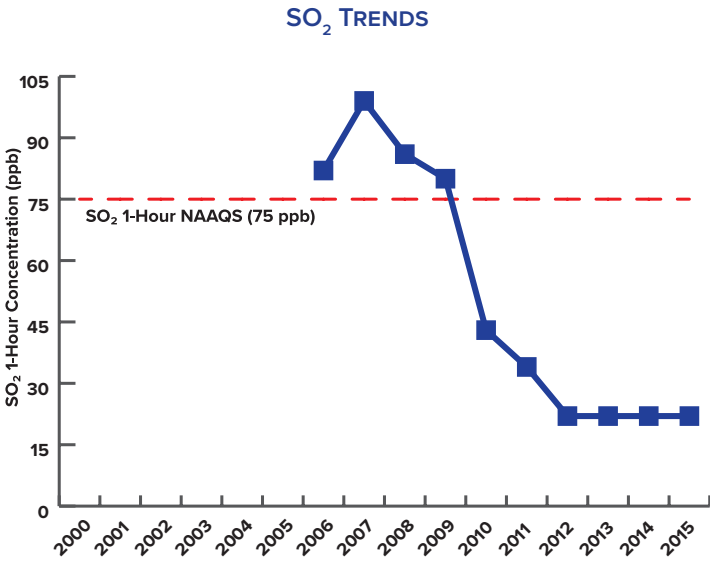




Sulfur Dioxide (SO_2)

The largest source of SO_2 in the atmosphere is the burning of fossil fuels by power plants and other industrial facilities. Smaller sources of SO_2 emissions include: industrial processes such as extracting metal from ore; natural sources such as volcanoes; and locomotives, ships and other vehicles and heavy equipment that burn fuel with a high sulfur content.

Short-term exposures to SO_2 can harm the human respiratory system and make breathing difficult. Children, the elderly, and those who suffer from asthma are particularly sensitive to effects of SO_2.



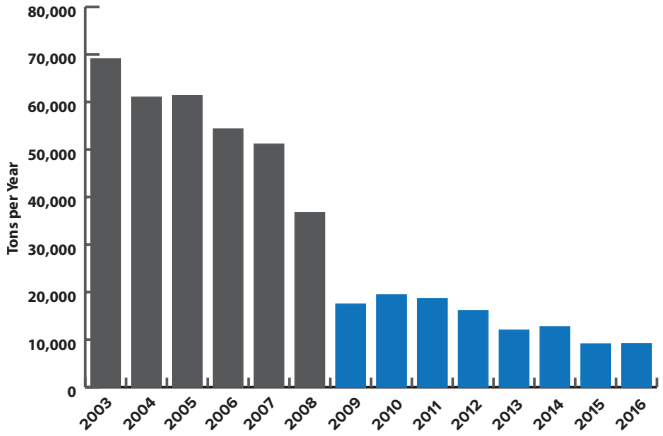
Continuing the Progress

Maryland continues to develop and implement new programs to ensure that the progress in cleaning the air over the past ten years continues into the future. Three of the cornerstone programs from the past that have driven the progress are the Healthy Air Act of 2006, the Clean Car Act of 2007 and Governor Hogan's 2015 nitrogen oxide (NO_x) regulation for coalfired power plants. New 2016-2017 initiatives to help continue the progress towards clean air include Governor Hogan's Clean Cars Act of 2017, new efforts to reduce SO_2 emissions and the November 2016 Maryland petition to EPA that targets 36 upwind power plant units that significantly affect Maryland's air quality.

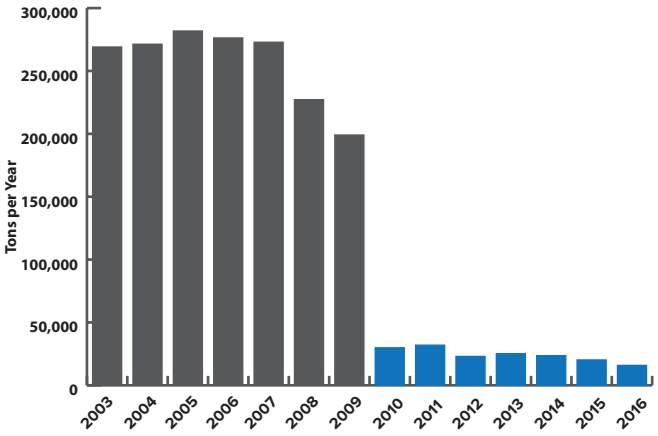
Reducing Emissions from Power Points

The Healthy Air Act, which required dramatic NO_x, SO_2, greenhouse gas, mercury and other emission reductions from Maryland power plants, was the largest emission-reducing initiative ever implemented in Maryland. Maryland power plants invested approximately $2.6 billion in new air pollution controls. Soon after these controls were in place both ozone and fine particulate levels began to drop dramatically. NO_x is the key pollutant that creates ozone. SO_2 and NO_x are the most important emissions that lead to fine particle formation. The Healthy Air Act also reduced mercury emissions by more than 90 percent.

NO_x Reductions from the Healthy Air Act



SO_2 Reductions from the Healthy Air Act

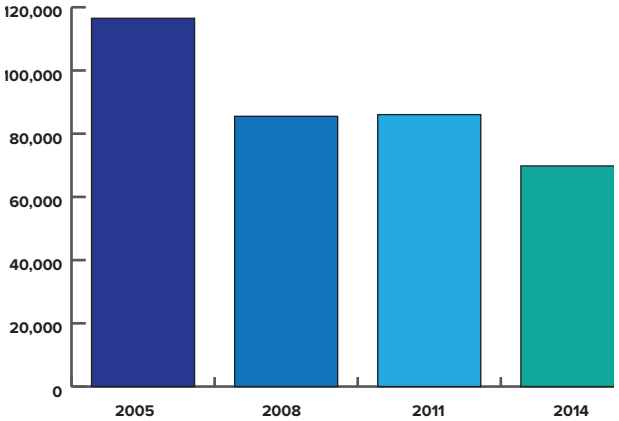


In 2015, Maryland implemented Governor Hogan's new NO_x regulations for coal-fired power plants to ensure that the State continued to reduce ozone and fine particulate air pollution. These regulations have had the additional benefit of helping clean up the Chesapeake Bay, as the airborne deposition of nitrogen is a major contributor to pollution in the Bay. Since this rule was implemented in 2015, Maryland's coal-fired power plants have recorded the lowest NO_x emissions ever recorded.

Clean Cars

The Clean Cars Act of 2007 also helped to dramatically reduce NO_x and greenhouse gas emissions. The law requires that vehicles purchased in Maryland be the lowest emitting vehicles allowed by law. This law has also played a major role in helping the State lower ozone and fine particulate levels to protect public health and in meeting climate change goals.

NO_x Emissions from Highway vehicles



In 2016 and 2017, Maryland continued to work on programs to ensure that air quality progress will continue. Five of those initiatives are described below.

Electric Vehicle and Clean Diesel Initiatives in Maryland

Vehicles continue to be a significant source of NO_x and greenhouse gas emissions, accounting for more than one third of the current emissions of these pollutants in Maryland. In early 2017, the Clean Cars Act of 2017, a bill sponsored by Governor Hogan, was adopted. This law will provide tax incentives through 2020 to encourage consumers to purchase electric vehicles. The State, working through the Electric Vehicle Infrastructure Council (EVIC) and the Electric Vehicle Infrastructure Program (EVIP), has also begun to invest in the infrastructure needed to ensure that consumers can easily charge their electric vehicles. Supported by State legislation, Maryland is one of the leaders in the East in installing electric vehicle infrastructure, including new "fast chargers" that dramatically reduce the time needed to get an "EV Fill Up."

As part of recent federal settlements with automaker Volkswagen for installing devices that allowed vehicles to exceed emissions standards and pollute the state's air, Maryland is eligible to receive approximately $76 million dollars from an environmental mitigation trust fund. This money is expected to dramatically enhance the State's efforts on Electric Vehicles and help Maryland with efforts to reduce emissions from diesel vehicles and other NO_x sources. In a partnership between the Port of Baltimore, the Maryland Department of the Environment and the Maryland Department of Transportation, more than $1 million has already been invested in clean diesel projects at the Port of Baltimore, with an additional $900,000 worth of new diesel projects in the works.

Reducing Air Pollution from Upwind States

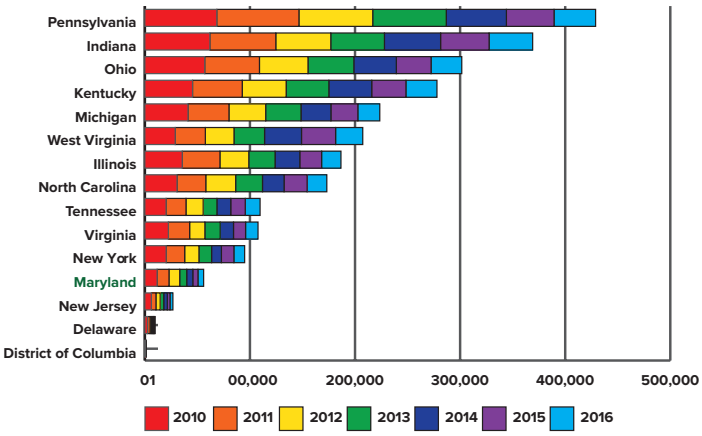
Maryland, in partnership with several local universities, runs one of the country's most effective air pollution research programs. The research team flies airplanes, uses satellite data, launches ozonesonde balloons and collects air pollution and wind data from mountaintop monitors to quantify ozone and fine particulate air pollution that floats into Maryland from other states. This effort shows, beyond any doubt, that on many days, 70 percent of Maryland's ozone problem originates in upwind states. Because of this, Maryland has a long history of working in partnership with other states and taking action, when it is necessary, to reduce "incoming ozone."

These efforts have begun to show results. NO_x emissions from power plants in upwind states have been decreasing each year. These reductions have, in somecases, been the result of state-to-state collaboration. In other cases, formal state actions or federal rules have helped reduce emissions. Maryland has participated actively in many state-to-state collaborations but has also petitioned EPA several times when the collaborations fell short and upwind states did not address the pollution from their power plants.

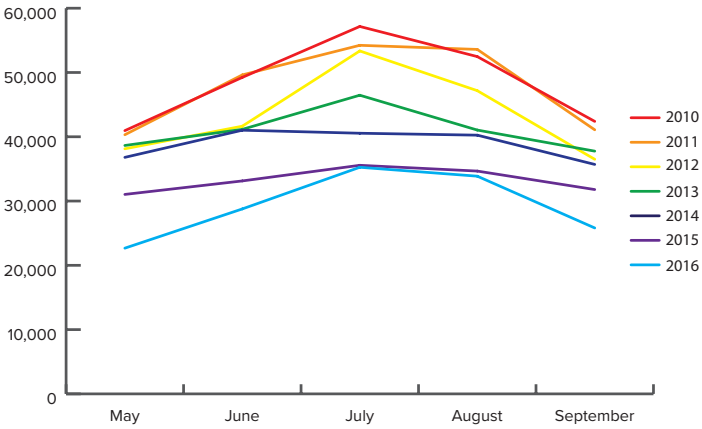
In November 2016, after collaborating with about 25 states for more than a year, Maryland submitted a petition to EPA under Section 126 of the Clean Air Act to further reduce NO_x emissions from 36 power plant units in Pennsylvania, West Virginia, Ohio, Indiana and Kentucky. EPA has already determined that these states significantly contribute to Maryland's ozone problem.

The 36 units have already purchased state-of-the-art NO_x controls, but they are no longer running those controls effectively. The petition simply asks EPA to require these units to run the already installed controls in a manner consistent with Governor Hogan's 2015 NO_x regulation for coal-fired power plants. This regulation requires NO_x pollution control equipment to be run optimally on every day of the summer ozone season. This simple action would result in up to 300 tons of NO_x reductions each day and could be the difference

Power Plant Ozone Season NO_x Emissions by State



Power Plant Ozone Season NO_x Emissions by Year (PA, WV, OH, IN, KY, MD)



between Maryland meeting or not meeting the old and new ozone standards. The petition, if successful, would also reduce NO_x emissions by about 40,000 tons during the summer ozone season, which would result in significant benefits to the Chesapeake Bay. It would also lower fine particle levels in Maryland.

New Reductions in Sulfur Dioxide Emissions

Because of the new SO_2 standard, Maryland has been working on several new control initiatives to further reduce SO_2 emissions. With the small area in Anne Arundel and Baltimore Counties being identified by EPA as potentially not meeting the new standard, Maryland is developing a plan to address this issue. The plan is due to the EPA in 2018, and must show that if there is any problem it is resolved by 2021. The main sources of SO_2 in this area are the Brandon Shores, Herbert A. Wagner and C.P. Crane power plants located in Anne Arundel and Baltimore Counties.

The Brandon Shores plant installed state-of-the-art SO_2 controls in 2009. The Wagner and C.P. Crane plants installed new controls in 2015 and 2016 to further reduce SO_2 emissions. These controls include the use of lower sulfur fuel and a dry sorbent injection system. Air quality modeling shows that SO_2 levels, with these new controls in place, are protective of public health.

Reducing Greenhouse Gas Emissions

In 2016, the Maryland Department of the Environment, working in partnership with the Maryland Commission on Climate Change, began to develop the plan required by the Greenhouse Gas Emission Reduction Act of 2016. This plan will reduce greenhouse gas emissions by 40 percent by 2030 while also supporting a healthy economy and the creation of new jobs. The plan is due by the end of 2018. The State's existing plan to reduce greenhouse gas emissions by 25 percent by 2020 will continue to generate deeper reductions through 2030. New initiatives from 2016 and 2017 include Governor Hogan's Clean Cars Act of 2017, enhancements to the Regional Greenhouse Gas Initiative (RGGI) that are being discussed by the nine RGGI states, a ban on hydraulic fracturing, new efforts to reduce methane emissions and the Healthy Soils program. The Hogan Administration is committed to bipartisan solutions that protect the environment and provide affordable, reliable and sustainable energy to Maryland citizens and communities.

For more information see the Maryland Commission on Climate Change website:
http://mde.maryland.gov/programs/Air/ClimateChange/Pages/index.aspx