Maryland
Department of
the Environment

Cleaning the Air

Fine Particles: Well below health standards

Ozone: Lowest levels in 30 years

Mercury: Huge emission reductions

Sulfur Dioxide Nonattainment
In the Baltimore Area

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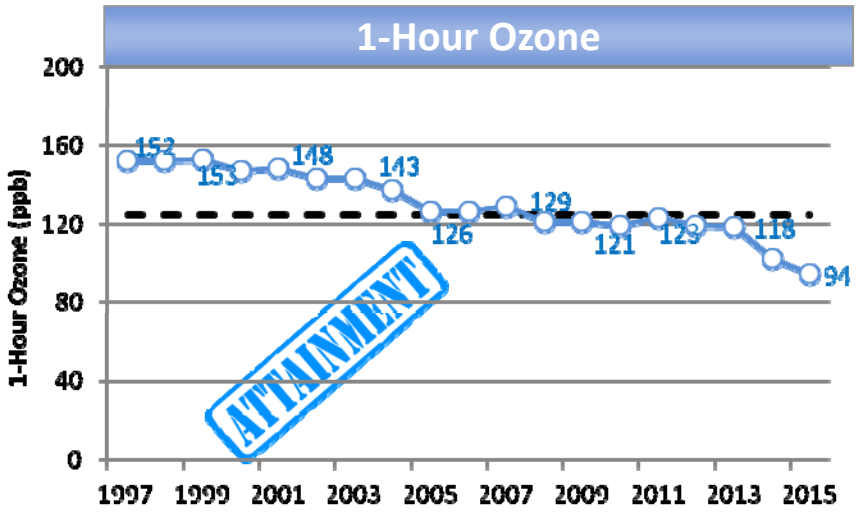
GREATER PASADENA COUNCIL ANNUAL MEETING – OCTOBER 5, 2016

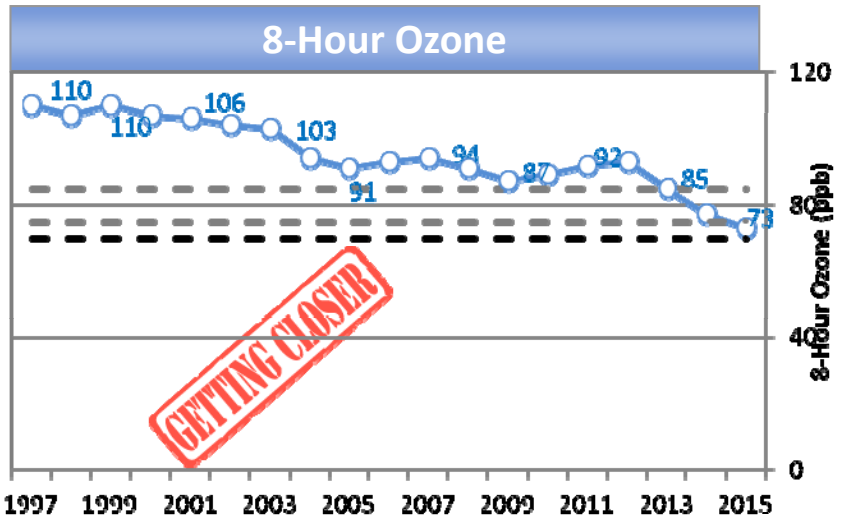
Topics Covered

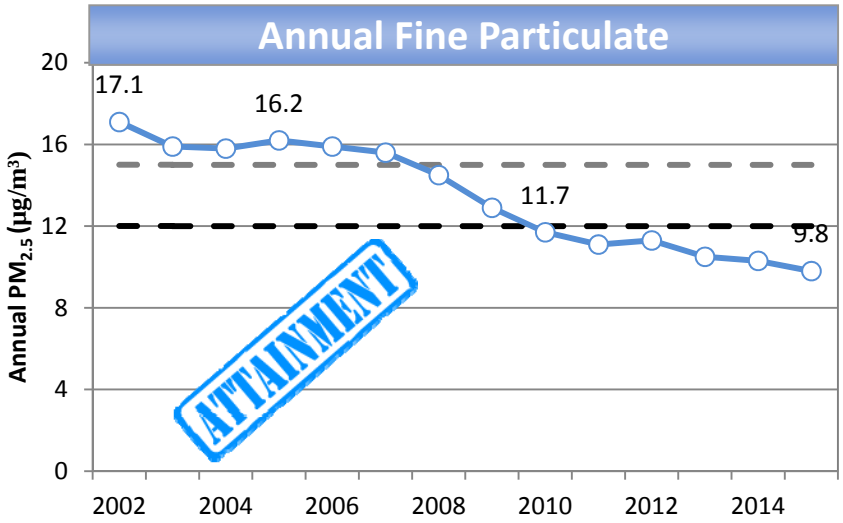
- Part 1
  - Maryland's air quality
    - 10 years of dramatic progress
- Part 2
  - Sulfur dioxide nonattainment in the Baltimore area
  - Opportunities to work together for even cleaner air

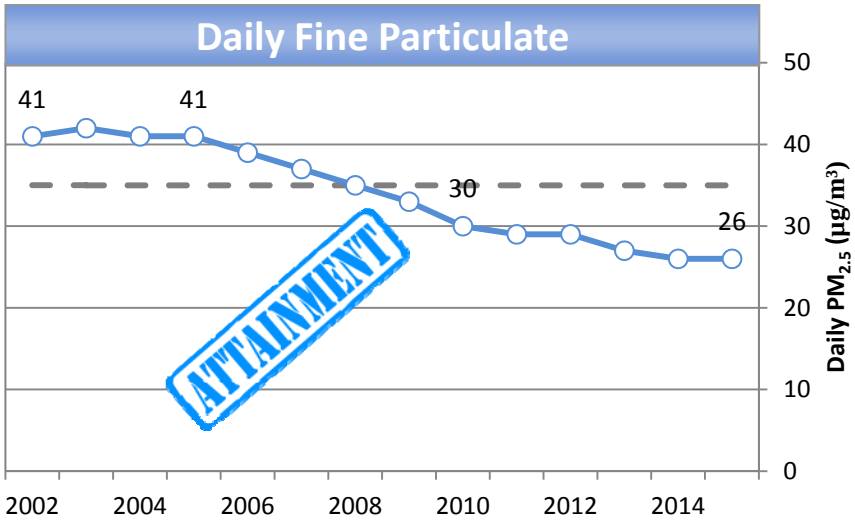
PART 1
CLEANING THE AIR
DRAMATIC PROGRESS OVER THE PAST 10 YEARS

Progress in Cleaning Maryland's Air





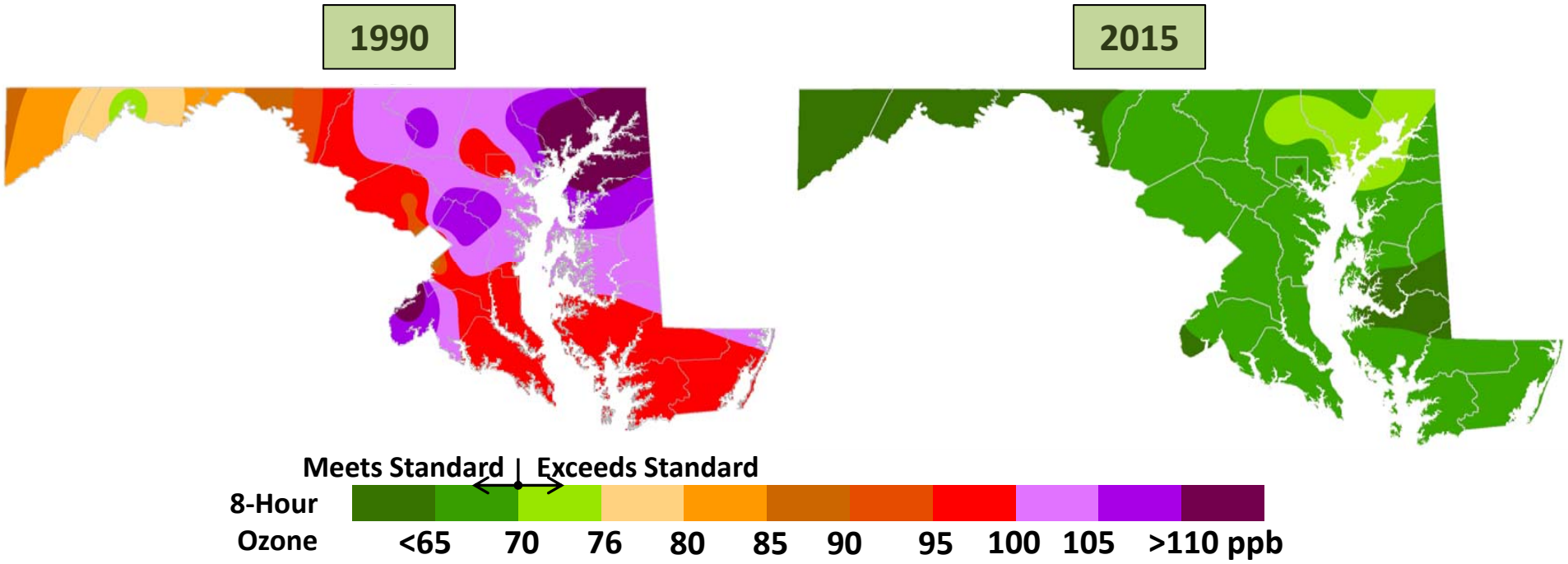




Clean Air Progress in Baltimore

- Baltimore has historically measured some of the highest ozone in the East
- From 2013 to 2015, the Baltimore area did not exceed the current ozone standard
  - First time in 30 years … weather did play a role
- EPA has finalized a "Clean Data Determination"
- With hotter weather, Baltimore may see higher ozone … but Baltimore will continue to improve
- New, lower standard begins in 2017
  - New challenges

The Shrinking Ozone Problem

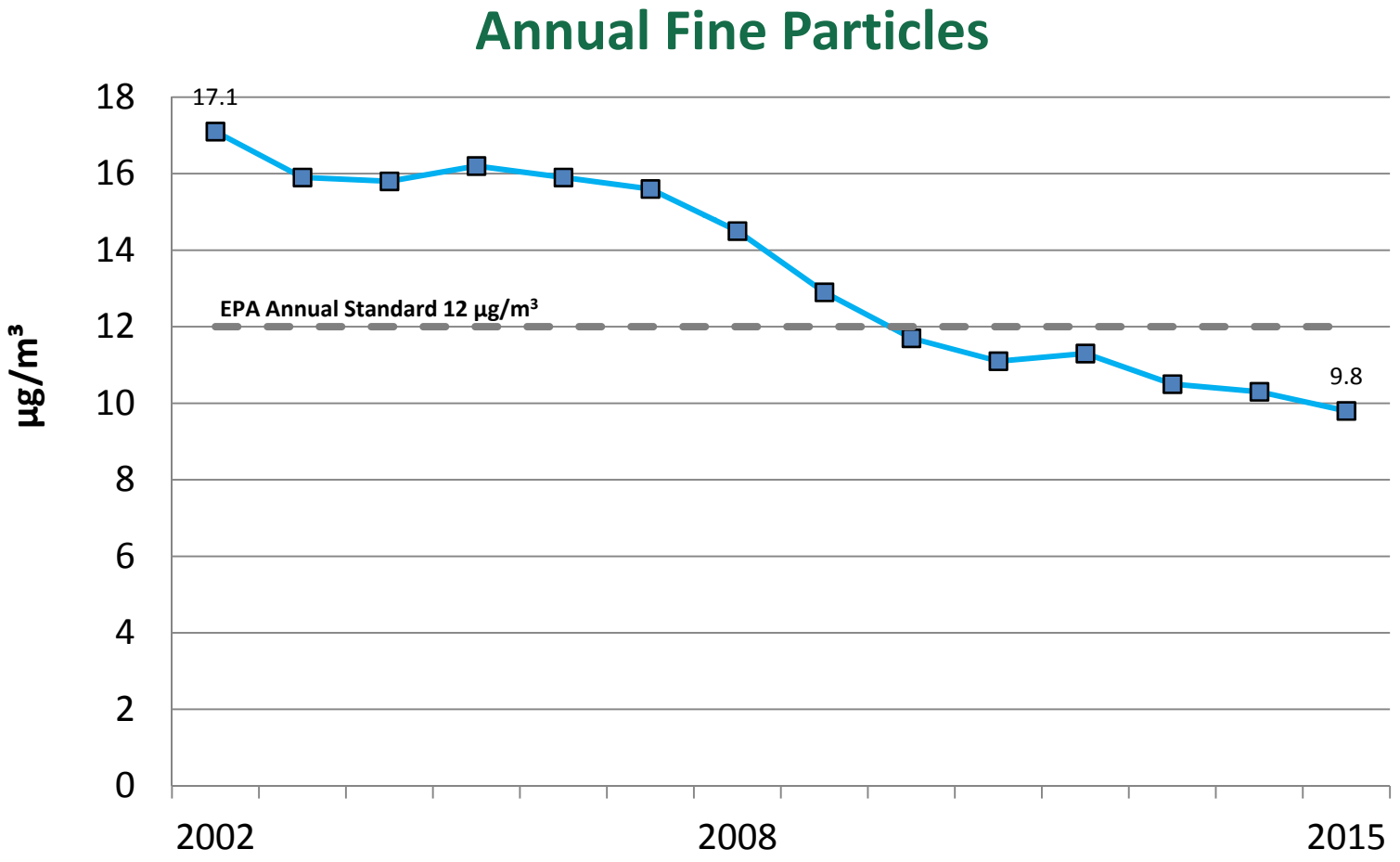


- In 2015 no monitors were above the 75 ppb threshold
- In 2015 only small areas of Baltimore, Harford and Cecil Counties were above the new ozone threshold of 70 ppb

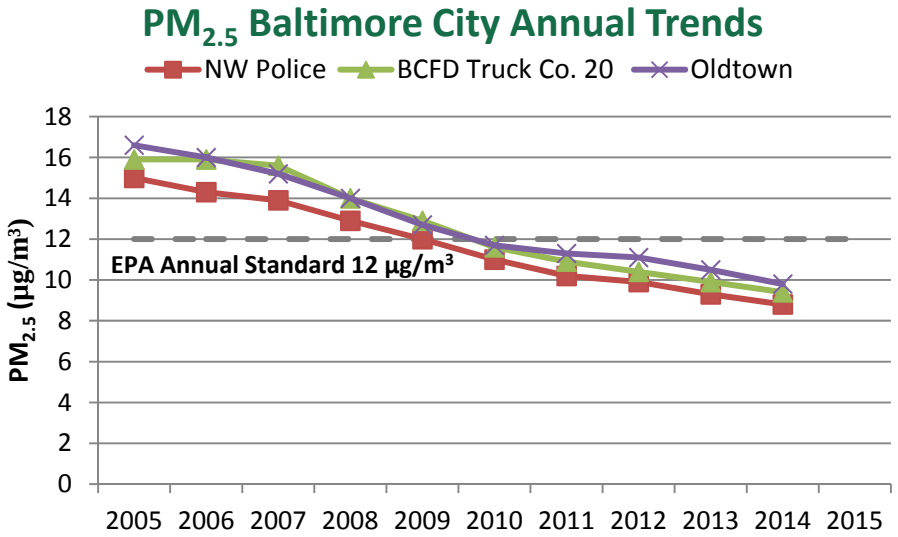
Progress Reducing Fine Particles

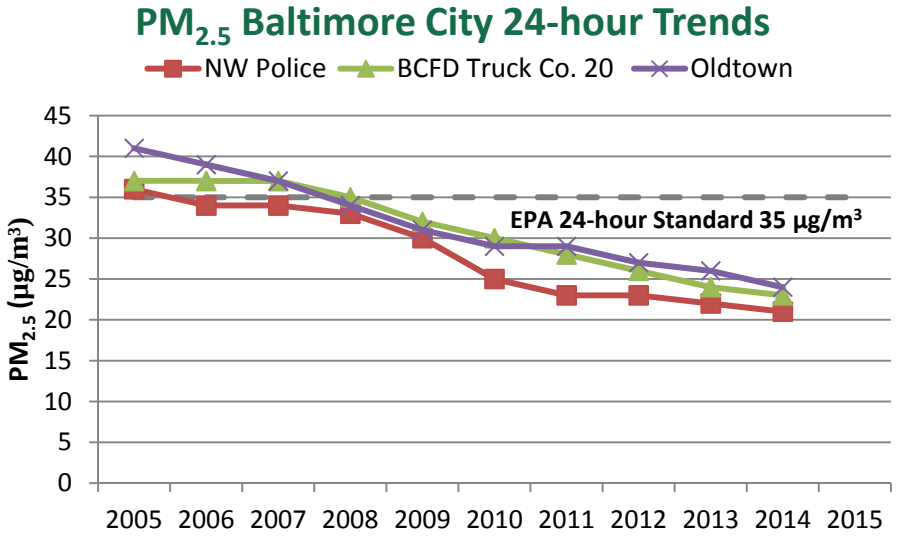
- Maryland is currently attaining the daily and annual fine particle standards across the state
- Fine particulate levels continue to trend down as SO_2 emission reductions continue
- This is a major success story as the health risks associated with fine particulate are very significant

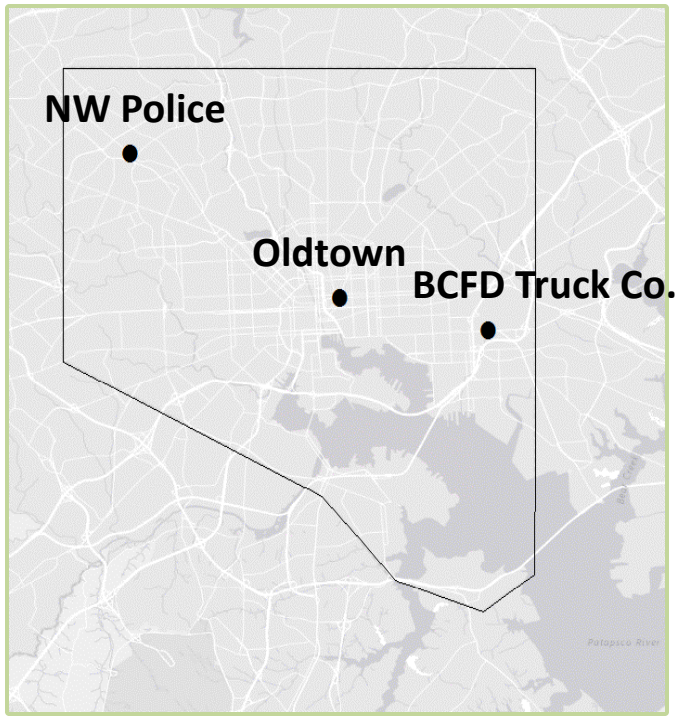
Fine Particle Air Pollution
Lower Levels Across the State



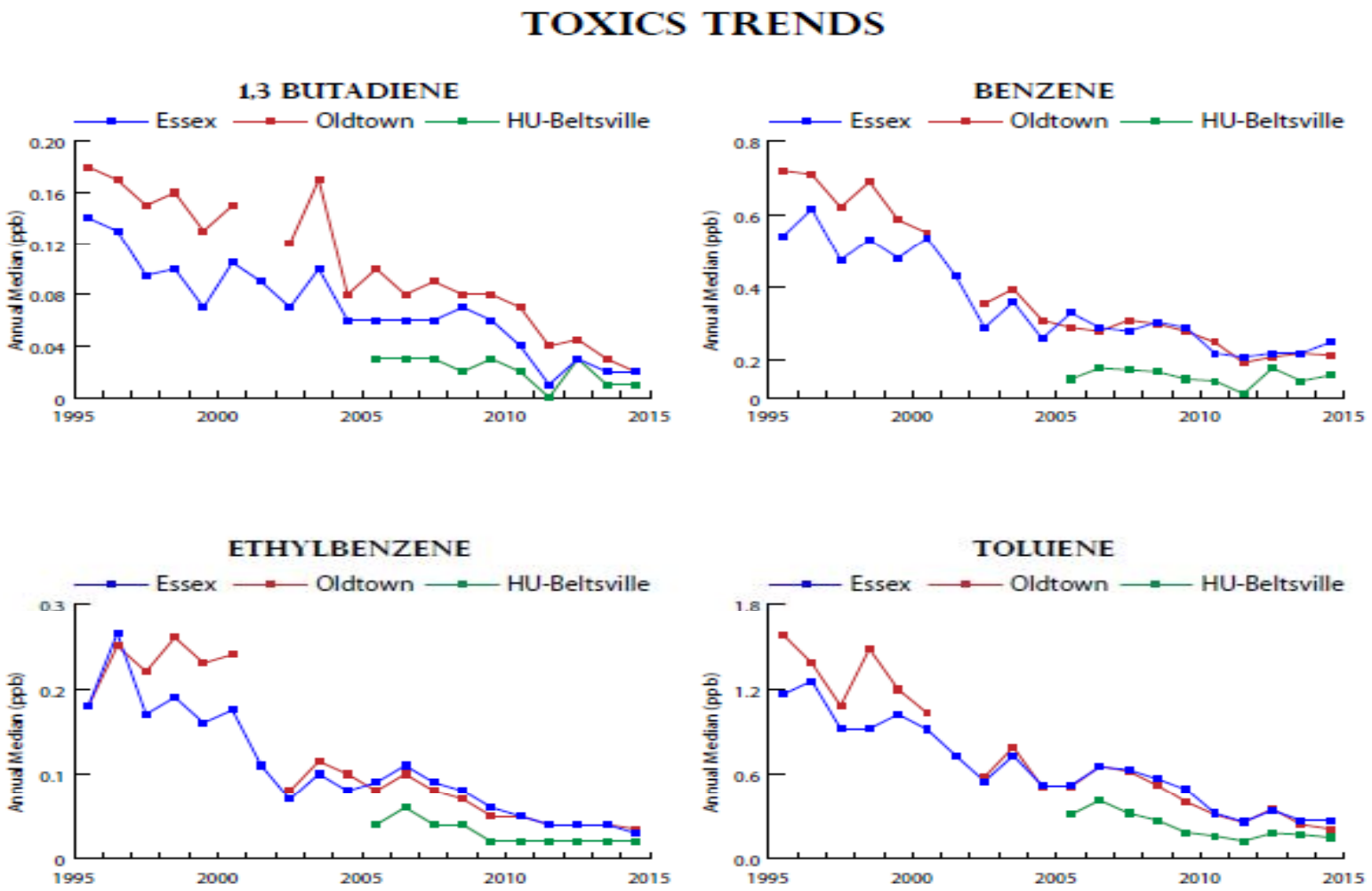
Fine Particles
Baltimore City Trends





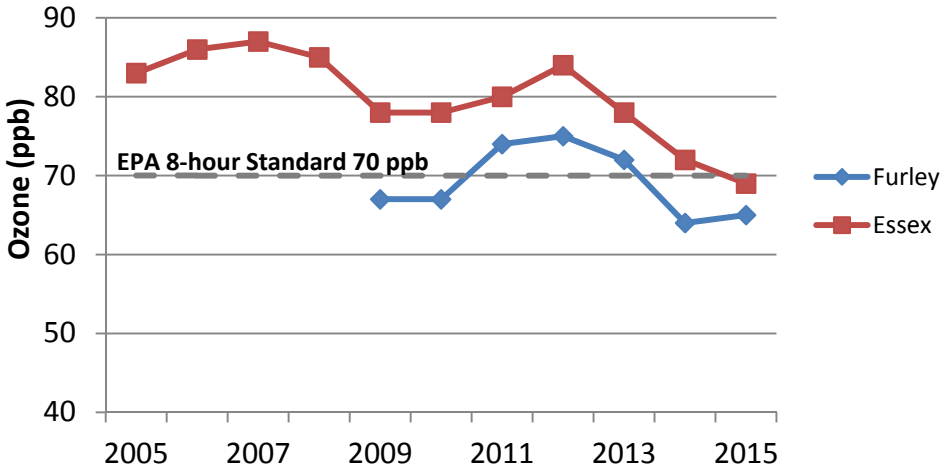


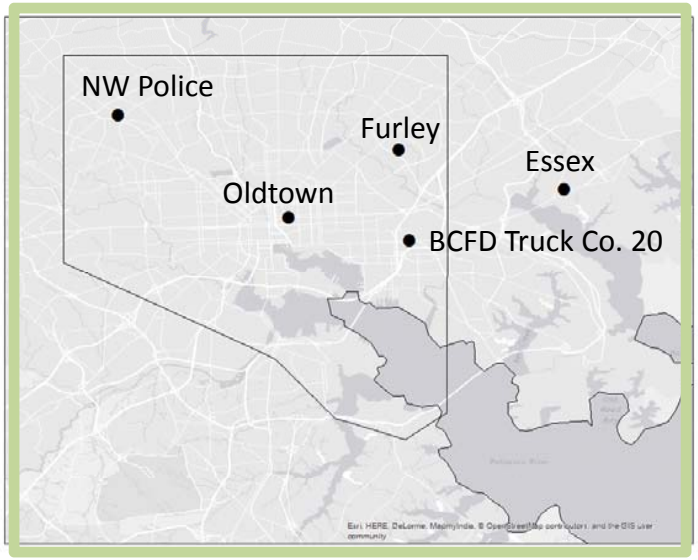
Maryland Air Toxics Trends



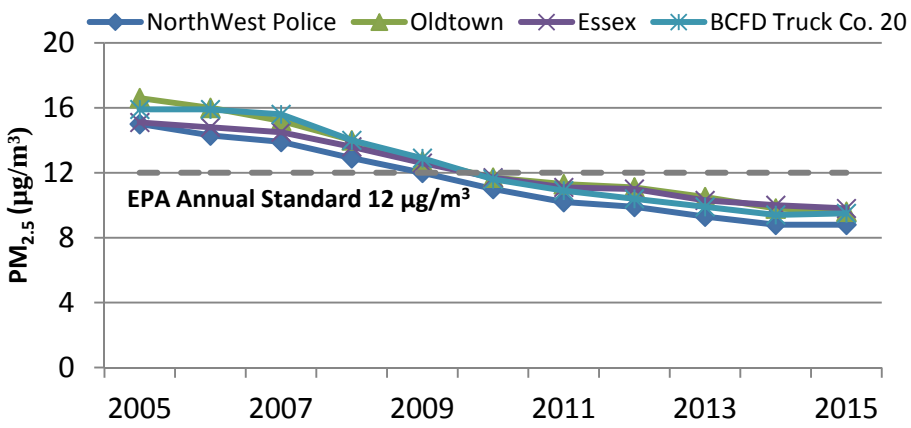
What Do Closer By Monitors Tell Us?

Area 8-Hour Ozone Trends

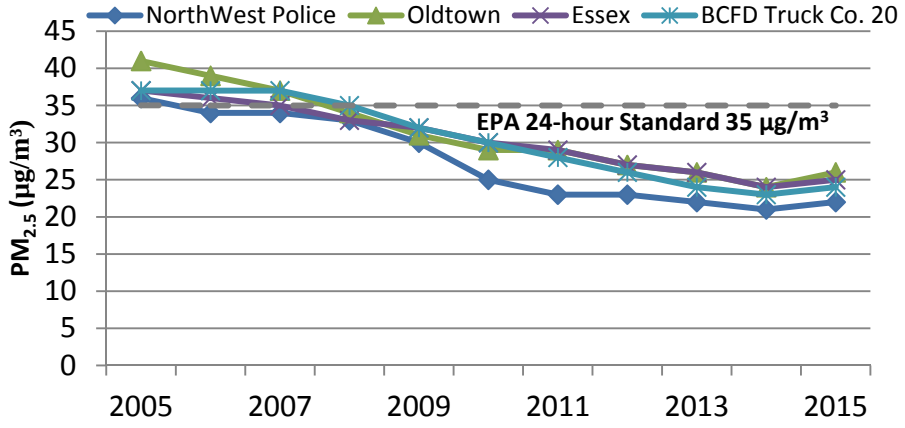




Annual Fine PM Trends



Daily Fine PM Trends



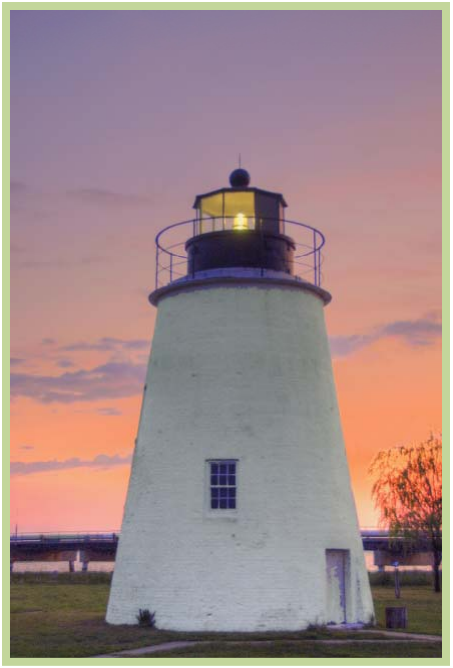

WHAT HAPPENED TO
DRIVE CLEAN AIR?

Key Pollutants

- Over the past 10 years, MDE has worked to reduce emissions of many pollutants. Six of the most critical pollutants include:
  - Nitrogen oxide or "NO_x" - the key pollutant to reduce to further lower ozone levels. Also contributes to fine particle pollution and regional haze
  - Sulfur dioxide or "SO_2" - the key pollutant to reduce for fine particulates and the new SO_2 standard. Also a major contributor to regional haze
  - Carbon dioxide or "CO_2" - the primary greenhouse gas that needs to be reduced to address climate change
  - Mercury (Hg) - a very important toxic air pollutant
  - Diesel particulate - diesel exhaust
  - Volatile Organic Compounds or "VOC" - also a contributor to ground level ozone. Many VOCs are also air toxics

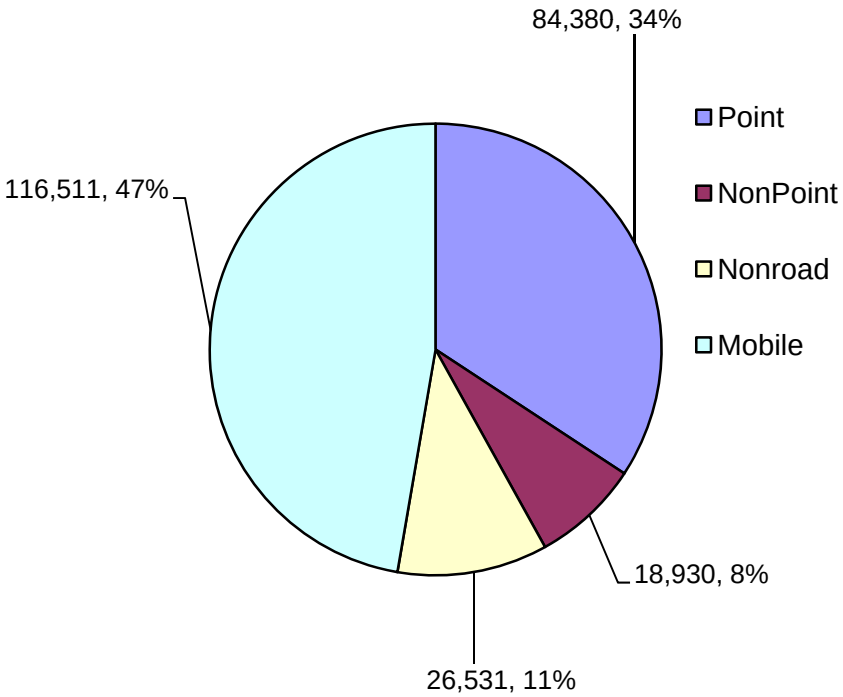
Key Emission Reduction Programs

- Since around 2005, Maryland has implemented some of the countries most effective emission reduction programs
  - These efforts have worked
- Power Plants
- Cars and Trucks
- Other smaller sources
- Area specific initiatives



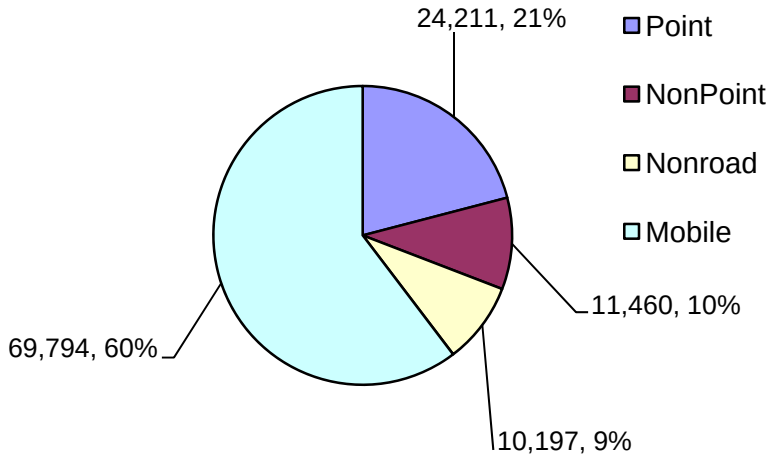
NO_x Emission Reductions 2005 to 2014

2005 Annual NO_x Emissions 246,000 tons per year



2014 Annual NO_x Emissions 115,000 tons per year

More than a 50% reduction

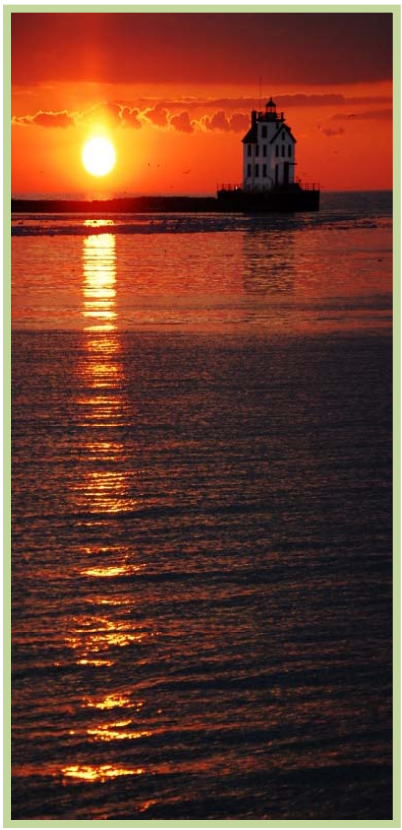


2005 to 2016 Control Programs
… a few examples

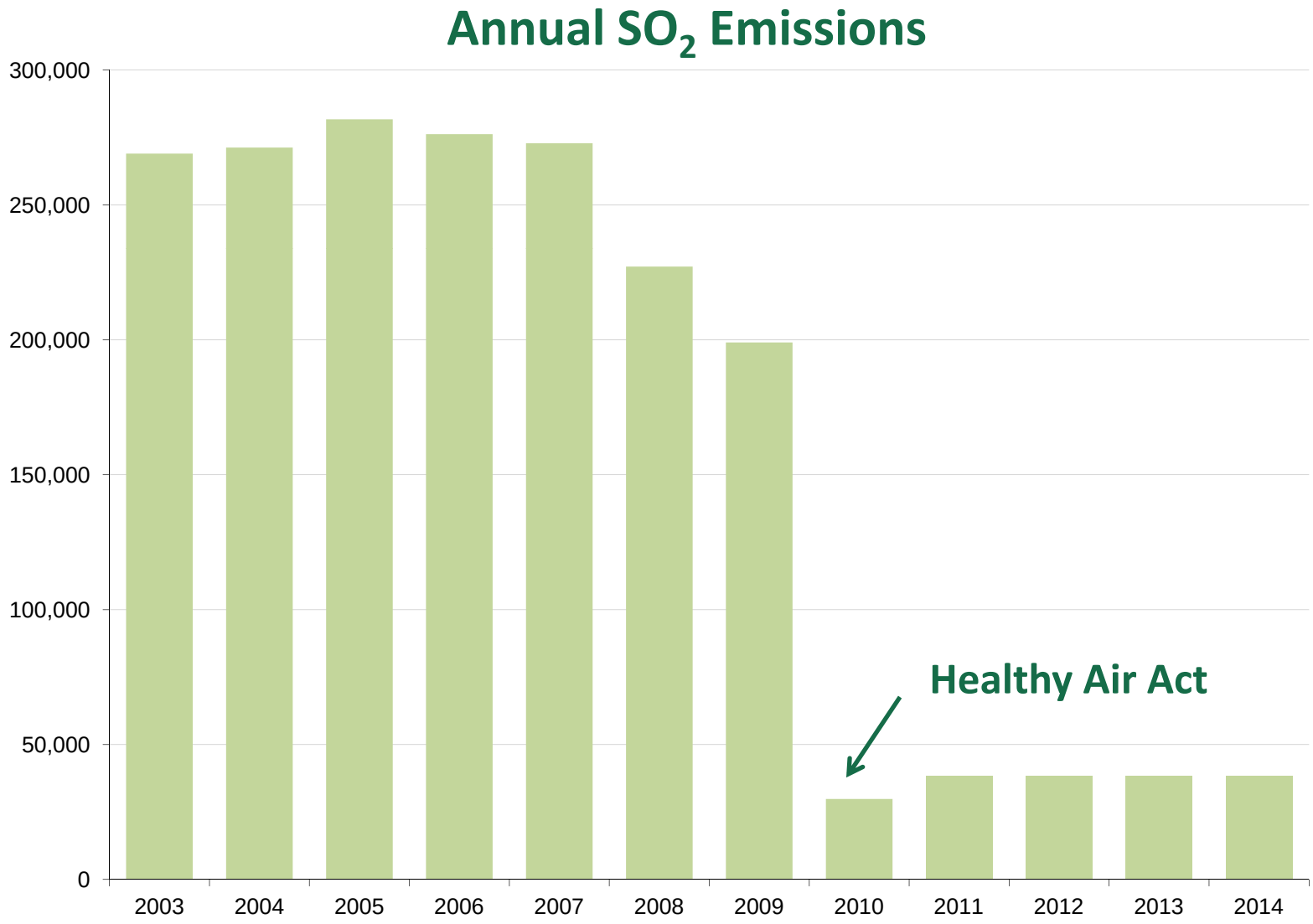
- Power Plants
  - The Maryland Healthy Air Act of 2006
- Cars and Small Trucks
  - The Maryland Clean Cars Act of 2007
- Diesel Trucks
  - Multiple Maryland initiatives
- Climate Change
  - The Greenhouse Gas Emission Reduction Acts of 2009 and 2015
- Area Specific Initiatives
  - The Port Partnership

Maryland Healthy Air Act

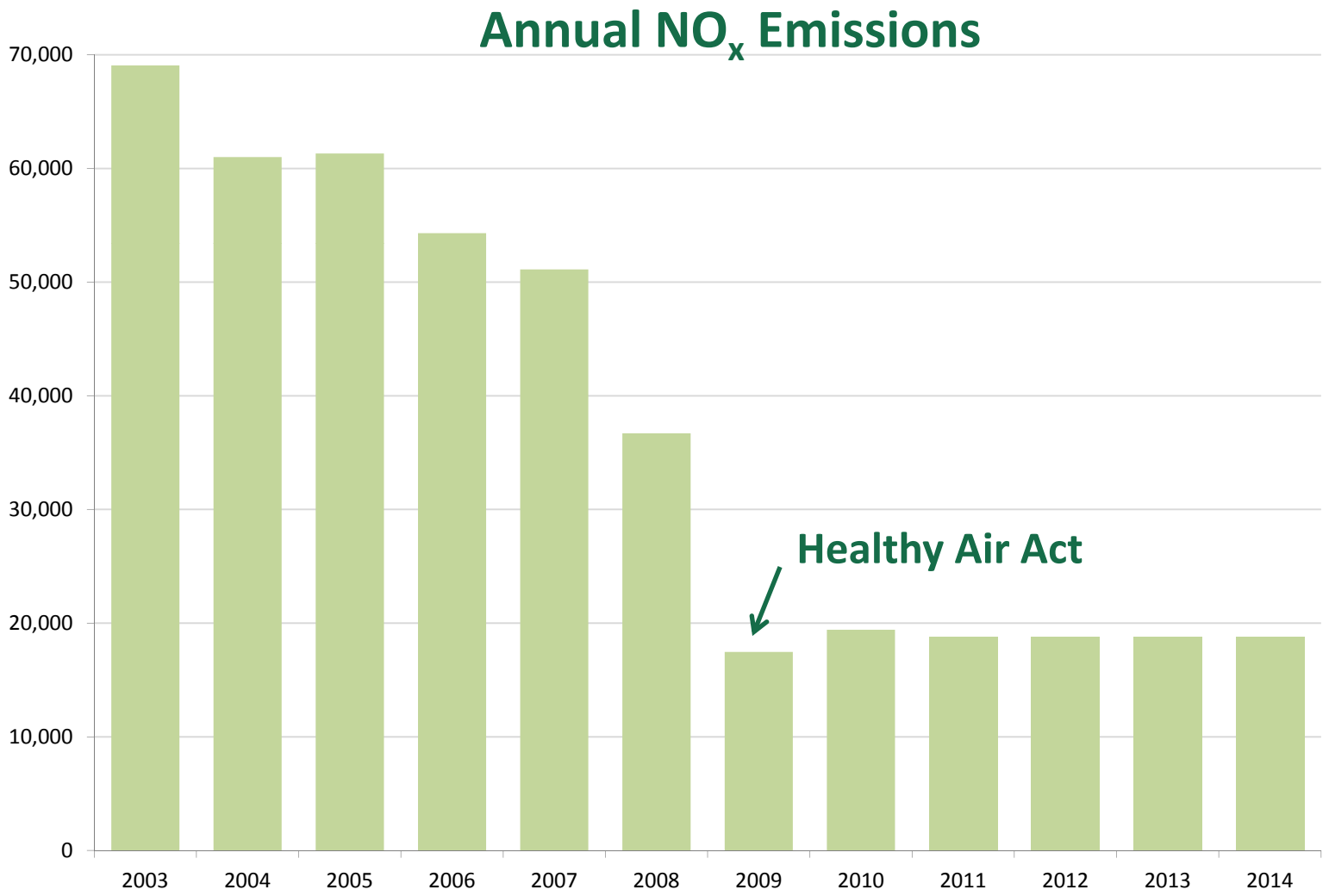
- The most significant emission reducing program in Maryland
- Widely applauded by environmental groups
- Environmental community & utilities worked with MDE as partners to design and implement
- Almost $2.6 billion investment by Maryland utilities
- Helped to dramatically clean the air – fine particles, ozone and mercury



Results: Sulfur Dioxide (SO_2)



Results: Nitrogen Oxides (NO_x)



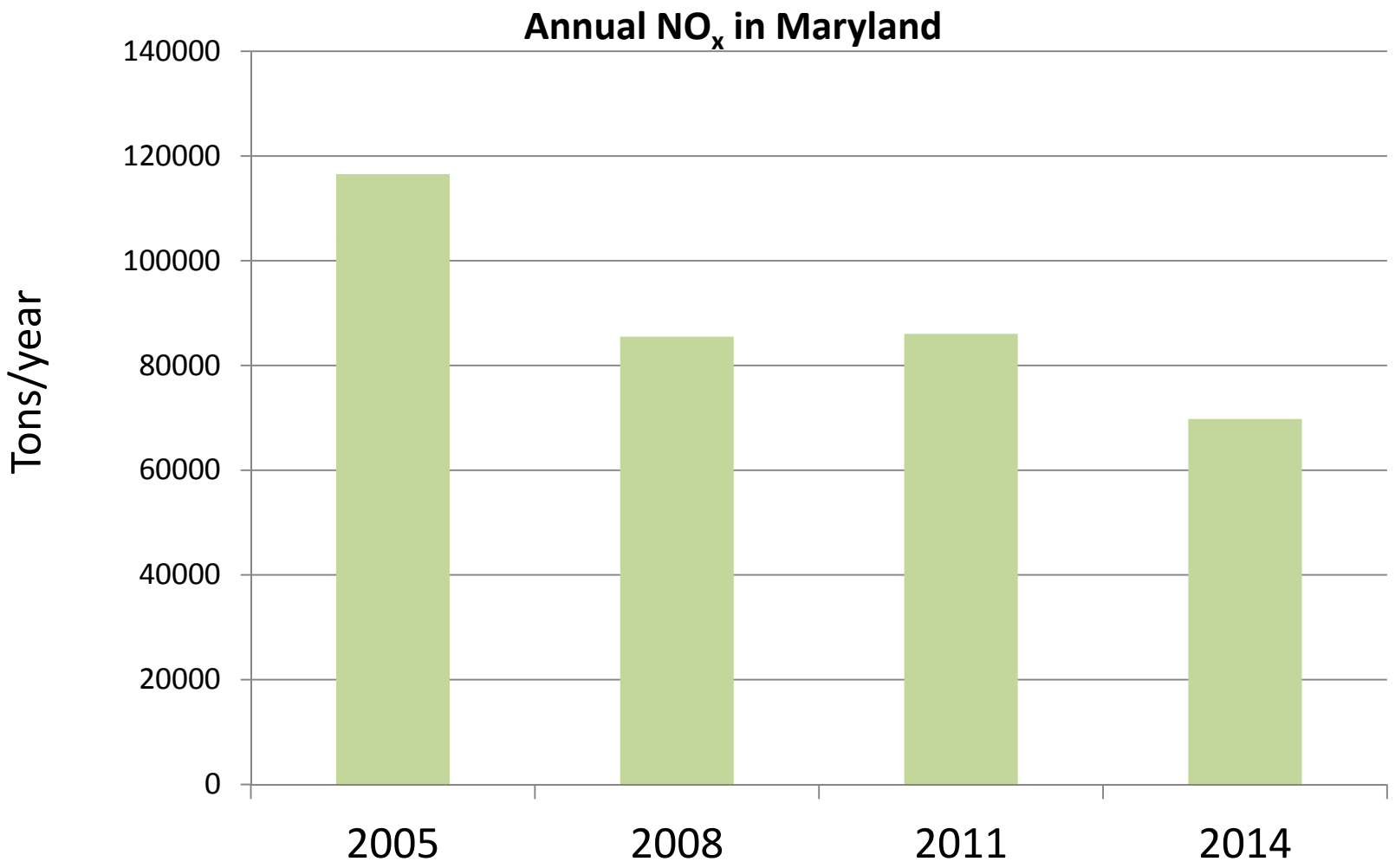
Results:
Mercury & Other Air Toxics

- Mercury
  - Exceeded the 90% reduction requirement for 2012 in 2010
- Hydrogen Chloride (HCl) reduced 83%
- Direct particulate matter reduced 60%

Maryland Clean Cars Act 2007

- Requires Maryland cars to be the cleanest allowed by law
- Works in tandem with Federal vehicle and fuel standards
- Includes requirements to push manufacturers to develop and sell “Zero Emission” vehicles

Mobile Source NO_x Emissions



Reducing Diesel Emissions

- Since 2004, Maryland has invested over $6.7 Million to clean up diesel vehicles

- Projects include:
  - replacing older port dray trucks
  - retrofitting hundreds of public school buses
  - replacing engines on Baltimore harbor vessels
  - installing stop/start devices on locomotives
  - retrofitting emergency vehicles

The Port Partnership

- A Clean Air Partnership
- Signed by Port of Baltimore and Maryland Departments of the Environment and Transportation in 2015
- Agencies and communities working together to identify, develop and implement new, cost-effective, programs that reduce emissions and increase energy efficiency - also helps create jobs
- Accomplishments so far:
  - $1,090,000 invested to replace older dray trucks with cleaner, new vehicles
- More emission reductions on the way
  - $900,000 for dray trucks, locomotives, and cargo handling equipment
  - New projects on the way using Volkswagen settlement funds

Climate Change

- Maryland has been one of the most aggressive states in the Country in addressing climate change
- Fourth most vulnerable state to sea-level rise
- Greenhouse Gas Emission Reduction Acts of 2009 and 2016
  - 2009 - 25% reduction in Greenhouse Gas (GHG) Emissions by 2020
  - 2015 - Enhanced law now also requires a 40% reduction in GHG emissions by 2030
  - Reduction programs must also have a positive impact on Maryland's economy and jobs
- 2015 progress report shows that the State is on track to achieve and perhaps exceed the 25% reduction by 2020

Regional Greenhouse Gas Initiative (RGGI)

- Maryland became the 10th member of RGGI (www.rggi.org) in 2007
- RGGI is a regional, "cap and invest" program focused on reducing CO_2 emissions from power plants
- Has reduced CO_2 emissions by 45% across the RGGI region
- Has created over $500 million for use by RGGI states to support energy efficiency programs and low income customers
- In 2016, RGGI will consider options to make RGGI work even better
  - A robust stakeholder process is underway


NEW CHALLENGES

Continuing the Progress

- In 2015…
  - EPA strengthened the health based standards for ozone and SO_2
  - The Maryland General Assembly enhanced the GGRA
- This requires additional efforts to:
  - Reduce NO_x emissions … the key pollutant for reducing ozone levels
  - Reduce SO_2 emissions … the key pollutant for the SO_2 standard and continued progress in reducing fine particles
  - Reduce CO_2 and other GHG emissions to address climate change
- The good news is that new control programs are already on the way

New Ozone and SO_2 Challenges

- Ozone
  - Significant additional NO_x emissions reductions between 2017 and 2020 from:
    - New power plant regulations adopted by the State in 2015
    - New federal controls on vehicles and fuels (adopted in 2015)
    - New federal controls on upwind power plants (adopted in 2016)
  - The new federal controls on vehicles and power plants are absolutely critical for Maryland. Approximately 70 percent of Maryland's air pollution problem originates in states that are upwind of Maryland

- SO_2
  - Lower sulfur coal and new "post-combustion" controls at several of the power plant units at the Wagner Station facility in Anne Arundel County
    - Required by federal rules
  - Crane station units that are also in the Wagner area and Wagner Unit #2 are scheduled for retirement or other major changes

Climate Change Progress

- Maryland is on track to reduce GHG emissions by 25% in 2020 as required by the GGRA of 2009
  - Over 50 pollution control programs in the State plan
- Comprehensive effort now underway through the Maryland Climate Change Commission to achieve the 40% GHG reduction required by the 2016 enhancements to the GGRA
  - http://mde.maryland.gov/programs/Marylander/Pages/mccc.aspx
- Reduction programs must also support the States economy and create new jobs
- One of the major areas of focus for the Commission is to insure that climate change programs benefit environmental justice areas and other underserved populations


PART 2
SO_2 NONATTAINMENT

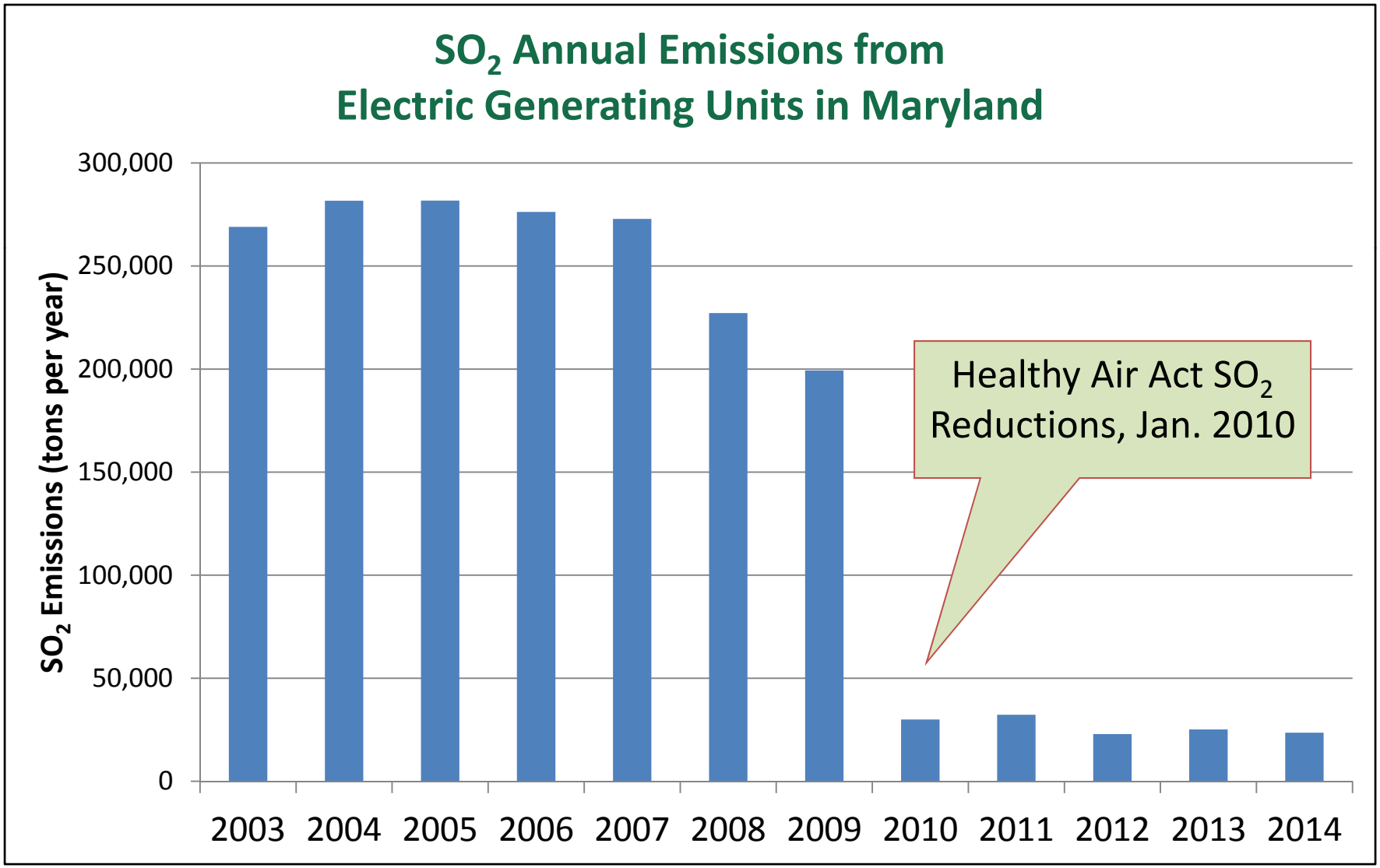
The Basics

- In 2010, EPA promulgated a 1-hour national standard for sulfur dioxide (SO_2)
  - The level of the standard is 75 parts per billion (ppb)
- In July 2016, EPA designated portions of Anne Arundel and Baltimore Counties as "nonattainment"

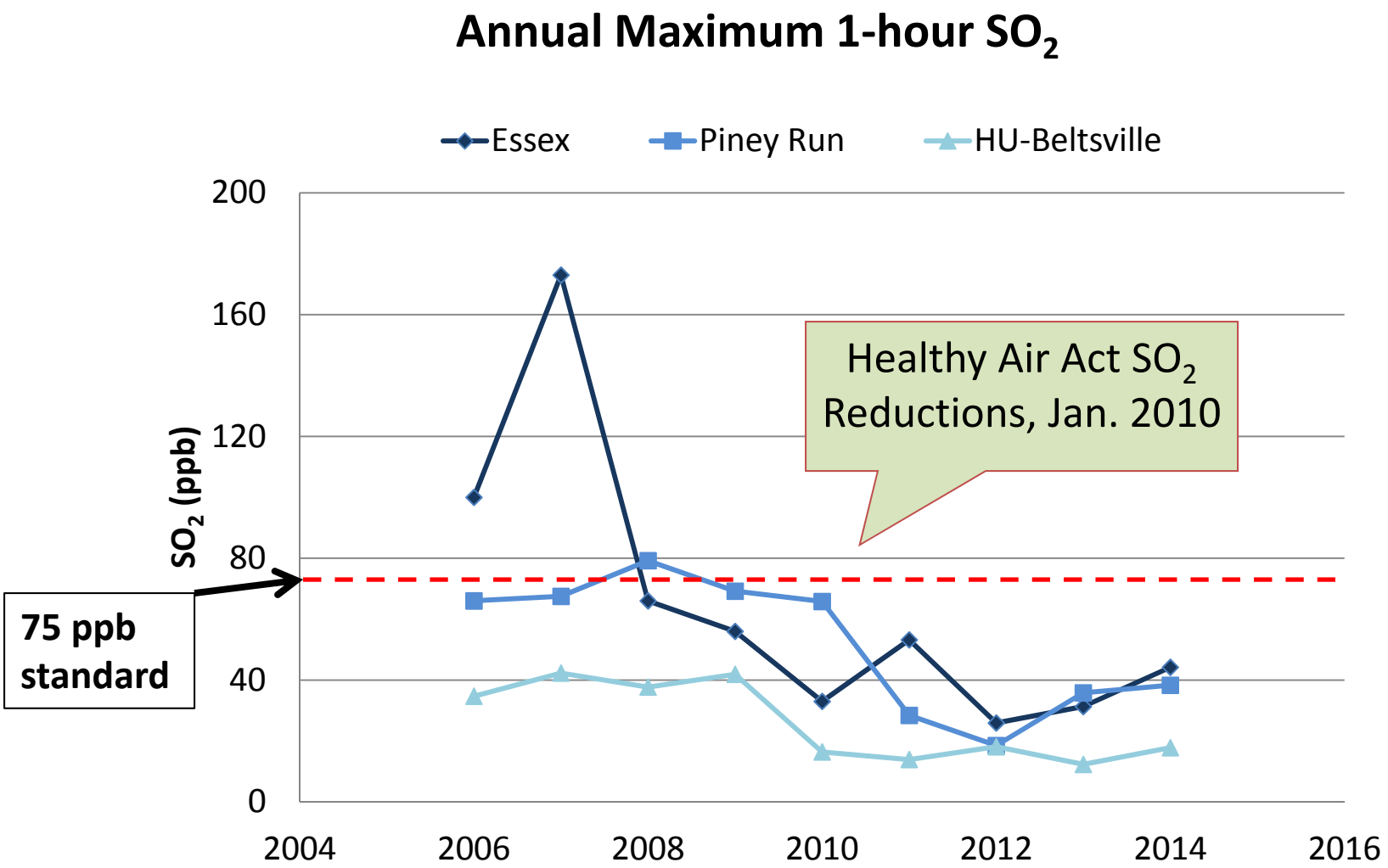
MDE Does Not Agree With EPA

- Analysis shows that current SO_2 levels are below the standard
  - EPA's designation is based upon 2012 to 2015 data
- MDE completed comprehensive analyses of 2015-2016 conditions
  - Governor Hogan recommended to EPA an "attainment" designation
- Analysis using most recent data shows that the area is in attainment
  - In 2015-2016, Wagner Unit #2 switched to coal with lower sulfur content and new controls were implemented at Wagner Unit #3
  - Historical SO_2 emissions levels & background concentrations in Maryland have dropped substantially

SO_2 Emission Reductions

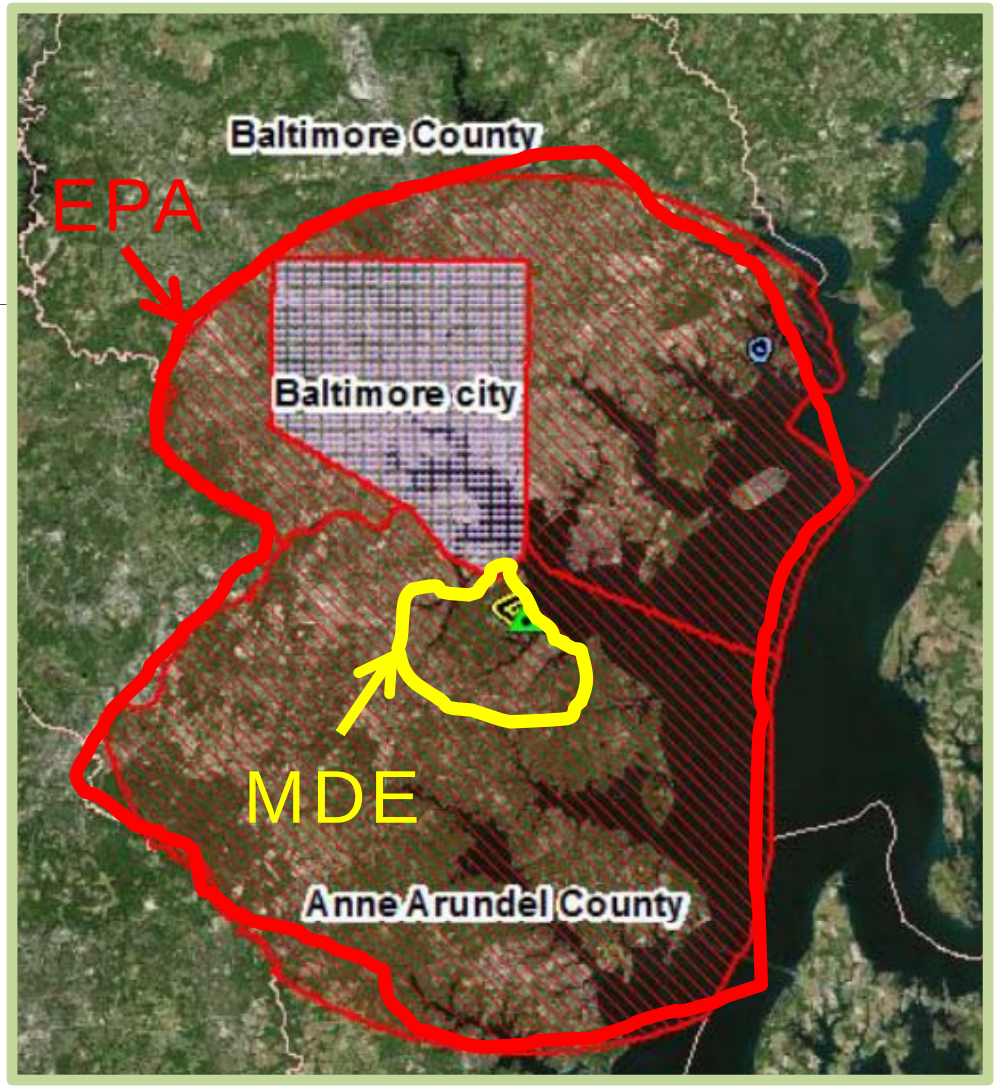


Historical SO_2 Levels in the Air Have Also Dropped Since 2010



The EPA Nonattainment Designation

- EPA relied largely on older data when the new controls were not in place
- EPA's area includes large portions of Anne Arundel and Baltimore Counties
- Excludes Baltimore City
  - Still not sure why
- Even using the older data that EPA used, MDE analysis shows a much smaller area should have been recommended



Major SO_2 Sources in the Area

- The three largest SO_2 sources in the area are:
  - The Crane power plant in southeastern Baltimore County
  - The Wagner and Brandon Shores plants in Anne Arundel County
  - Since 2007, over $1 Billion has been invested at the coal units at these plants to reduce SO_2 and other emissions
    - Controls installed and now operating include SO_2 scrubbers and low sulfur coal, Selective Catalytic Reduction (SCR) controls for NO_x, activated Carbon for mercury and more
    - Retirements or other major changes are also scheduled for Unit #2 at Wagner Station and both coal units at the Crane plant

Maryland's Plan to Confirm Attainment

- Maryland is required to develop a State Implementation Plan (SIP)
  - A SIP is due in 2018 … it will show how the area is currently attaining the standard.
  - MDE plans to submit the SIP ASAP
  - Will include and make federally enforceable all of the new controls and changes that have occurred or are planned between 2015 and 2020

How Will Attainment Be Proven?

- EPA requires MDE to submit modeling for 2020 that will show the area is in attainment
- Maryland would prefer to have monitors set up to prove attainment
- EPA has not provided the State with funding to set up and run new monitors
- To push EPA to fund new monitors you should contact EPA Region 3
  - MDE can provide contact information

What Real Risk are Pasadena Residents Exposed To?

- MDE believes analysis of current data shows that SO_2 levels in the area are below the standard
- It is also very clear that levels in 2016 are much lower than what the levels were 10 years ago
- Updated analysis of what SO_2 levels will be in 2016 and beyond will be included in the SIP

What is the Linkage Between Asthma and SO_2 Attainment?

- Exposure to high SO_2 levels are clearly linked to respiratory symptoms, such as tightening of the chest, especially in asthmatics
- Analysis shows that current levels are below the new SO_2 standard
- The SO_2 standard was set at a level to protect all residents, including sensitive individuals such as children and the elderly, with an adequate margin of safety

What is the Linkage Between Cancer and SO_2?

- According to the International Agency for Research on Cancer (IARC), SO_2 is not classifiable as a cancer causing pollutant
- Other air pollutants in the Baltimore area have a stronger link to cancer
  - Diesel particulate
  - Benzene
  - 1, 3 Butadiene
  - All linked to mobile sources
- Many regulatory programs are designed to reduce these risks
- Opportunities exist for the State and local residents to work together to implement new initiatives to further reduce these risks

Summary

- The air is getting cleaner every year
- Maryland has already implemented aggressive pollution controls on Maryland power plants and motor vehicles
- These controls have been very effective
  - Maryland is measuring attainment for fine particulates and ozone and SO_2 levels have dropped dramatically since 2004
  - Still have work to do on ozone and SO_2
- New emission control programs are on the way
  - Vehicles, fuels, new power plant controls
- New opportunities - Partnerships with local communities

New Partnerships for Clean Air

- Despite the improvement in air quality, significant additional progress can be made by working together in partnership

- Examples:
  - A partnership between the State and the Community Associations in the Pasadena area, local elected officials and others toward deeper reductions in diesel emissions
  - A similar partnership looking at other important pollutants such as SO_2 and air toxics

- Many more –
  Let's talk about your ideas !!!


DISCUSSION