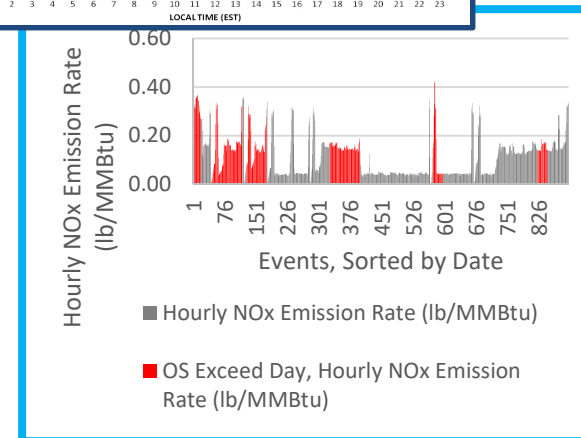
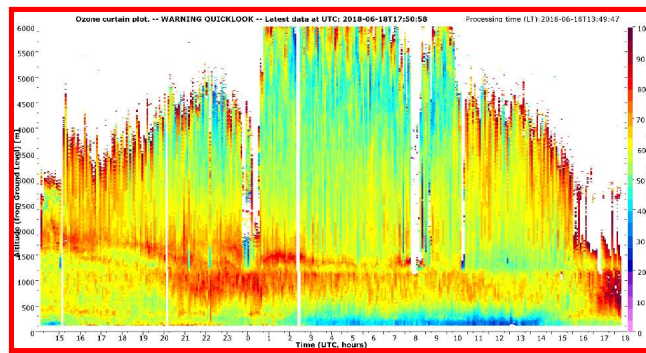
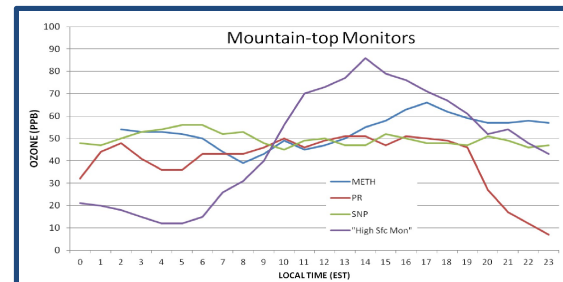
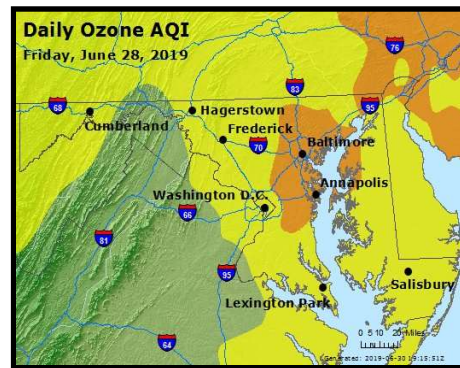




Maryland  
Department of  
the Environment

# Peak Ozone Day Partnership 2020 Season Kickoff



2020 Webinar – 04/16/20 - Tad Aburn, MDE



# Peak Ozone Day Partnership 2020 Season Kickoff Webinar

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- Welcome to today's meeting!
- This meeting is being **Recorded**. The webinar recording, presentations and related resources will be made available on the Air Regulations Stakeholder Meeting web page:

<https://mde.maryland.gov/programs/Regulations/air/Pages/ARMARegulationsStakeholders.aspx>





# GoToWebinar Starters

- After announcing yourself during introductions, please mute your audio to reduce background noise
- You may unmute your line to ask a question (see below); alternatively you may raise your hand in the control panel or ask a question in the chat box

## Mute Your Audio

You can mute/unmute your line from your Control Panel by clicking the microphone or telephone icon (a). If you dialed in to the audio conference via telephone, you must enter your Audio PIN before you or the meeting organizer can mute you.

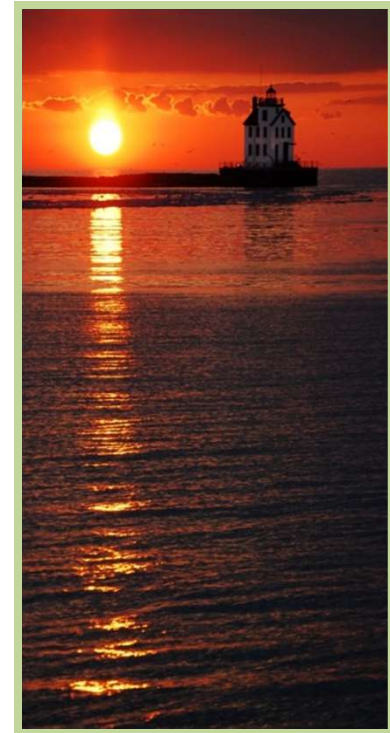




# Overview of Presentation

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- The Peak Ozone Day Partnership Program
  - Purpose of Program
  - Air Quality update
  - Link to MDE Research
  - 2019 Season Overview
- What our 2019 analyses tells us to date
  - Units that operated
    - Were the most-efficient units utilized?
  - Air Quality forecasts and outcomes
  - Operation of on-site generators
- 2020 Regulatory Helpers and PJM Deactivations
- Potential Regulation for Stationary Energy Sources





# Why Peak Ozone Days?

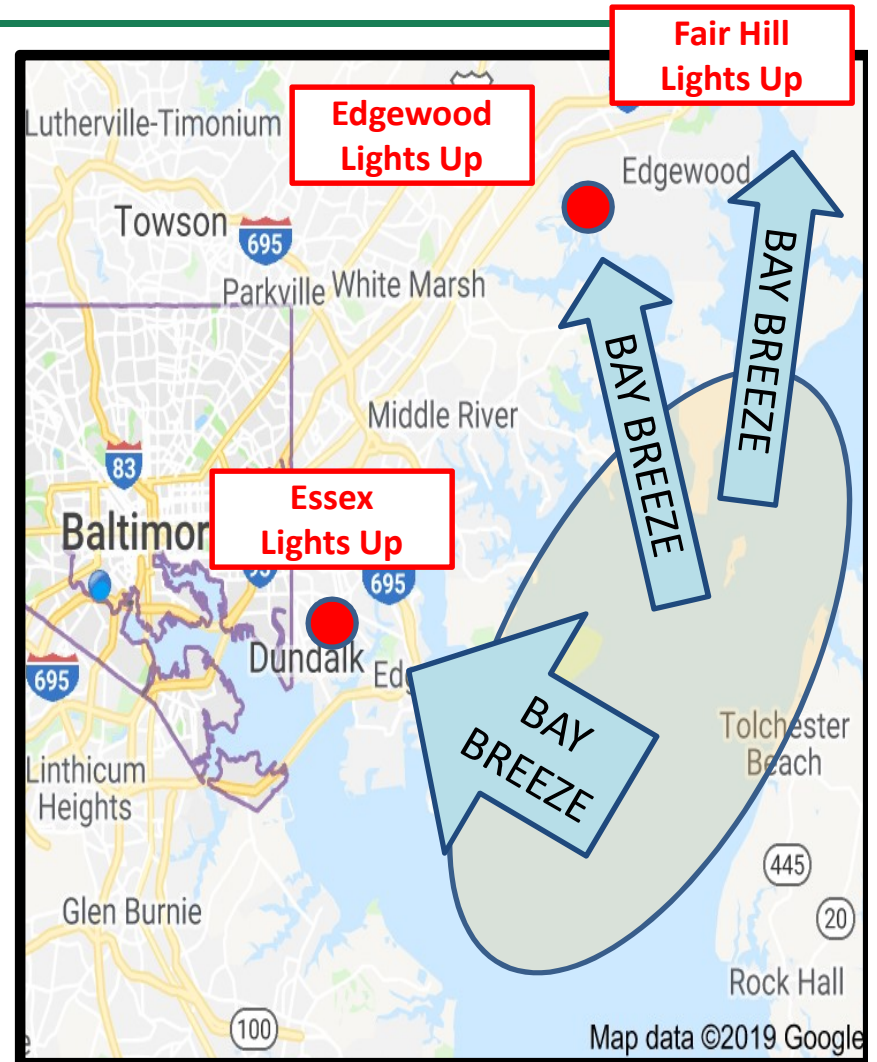
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- Four key reasons:
  - Getting closer to attaining the ozone standard each year
  - Public health risks from ozone are highest on the worst days
  - The monitoring attainment test focuses on peak ozone days
    - We get to attainment if the 3 year average of the 4<sup>th</sup> highest level at individual monitors ... during three consecutive years ... is below 70 ppb
  - A meteorology and emissions perfect storm
    - Peak days for ozone happen when the weather is hot
    - When it's hot ... energy units run the most ... clean units and less clean units
- Shaving the ozone peaks will reduce risk, help us towards attainment and reduce future regulatory burden on the energy sector



# Our Theory for How High Ozone Days are often Created in MD

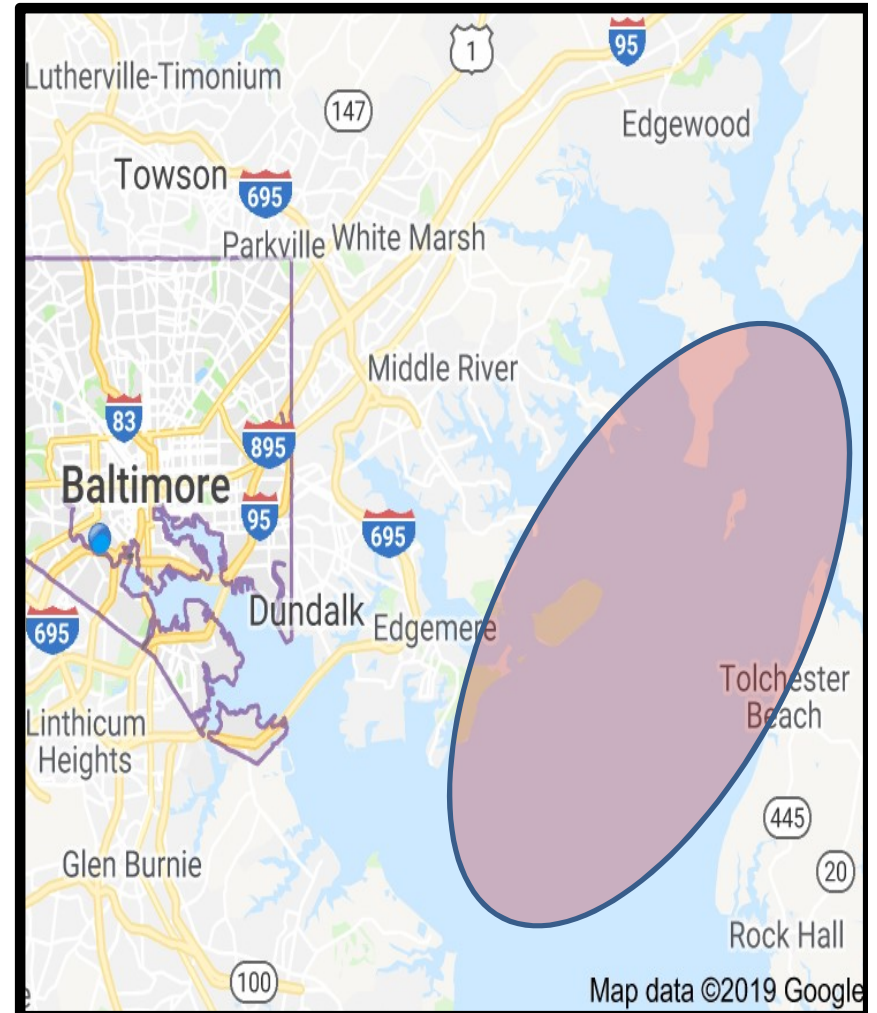
- Linked to our research on the “Land-Water Interface”
  - Why are highest levels of ozone often right near the Bay ... close to water?
- The theory
  1. Ozone builds up over the Bay
    - Transport plays a role ... mobile plays a role ... but
    - How significant are stationary sources that may emit at higher levels on real hot days?
  2. In the afternoon, Bay breezes push pollution over the Bay to the west, north, northwest or southwest
  3. Monitors directly downwind of Bay breeze record highest daily ozone





# So Where Does the High Ozone Over the Bay Come From?

- We believe there are four major contributing emission sectors to the high ozone we measure over the Bay
  - Some research ... some expert judgment
- The four most likely contributors:
  - Longer distance transport ... probably about half
  - Cars and trucks - VA and MD - I-95 corridor - probably about a third
  - Big and small boats - maybe up to a quarter
  - Close-by HEDD Units - Maybe a quarter



A bright sun shining through a blue sky with white clouds. The sun is positioned in the upper right quadrant, casting rays across the sky. The clouds are scattered and vary in density, with some appearing as soft, white puffs and others as more defined, layered formations. The overall scene is bright and clear, suggesting a sunny day.

**2019 DATA**

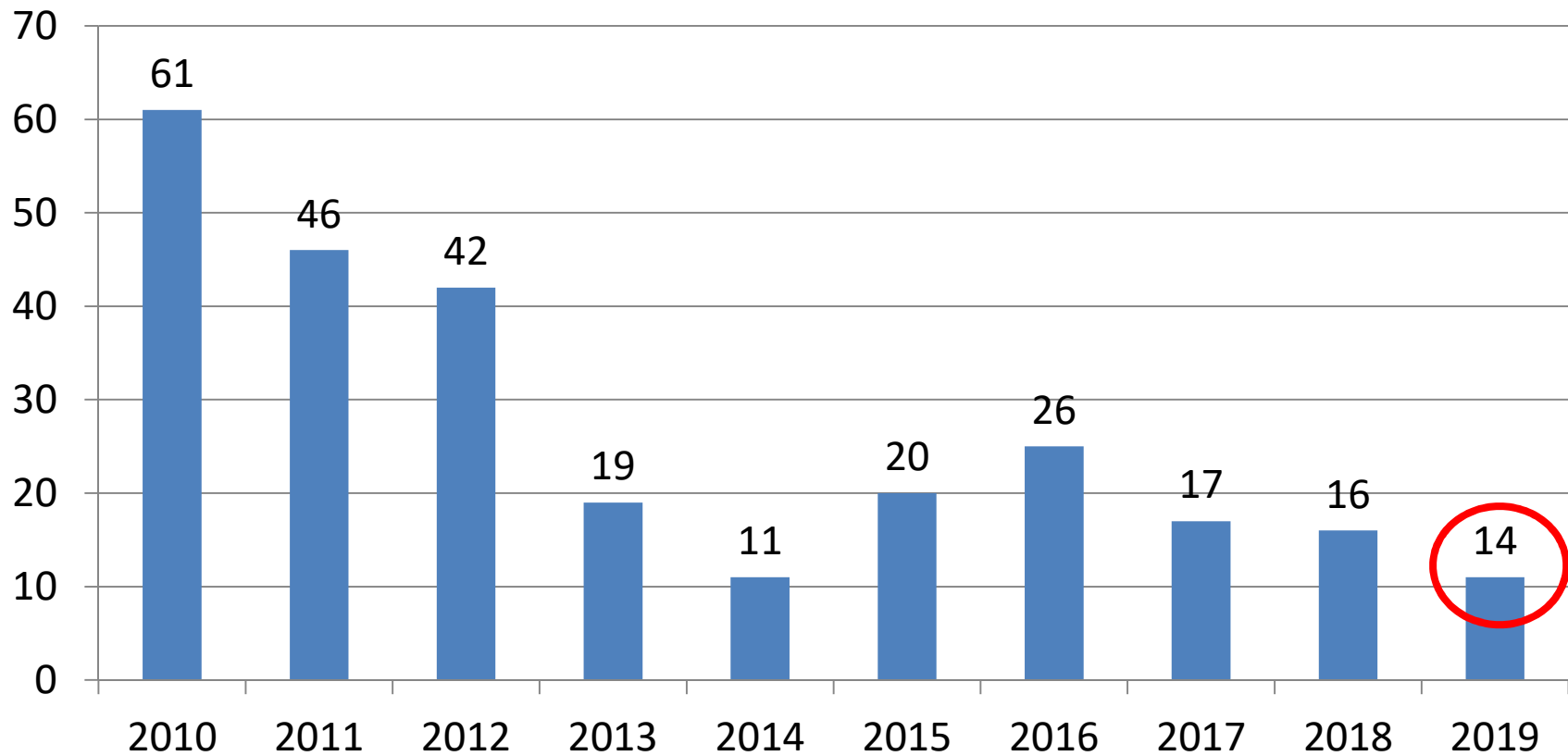
*HOW DID WE DO?*





# Maryland Bad Ozone Days

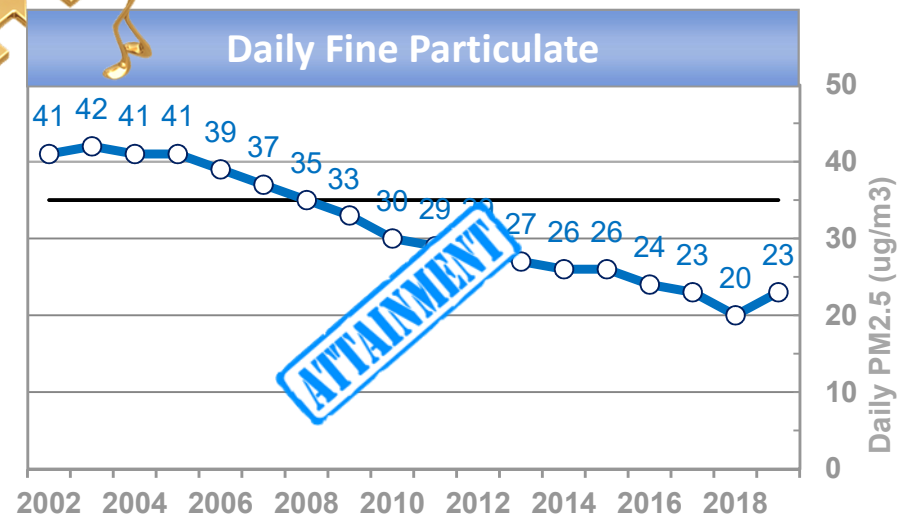
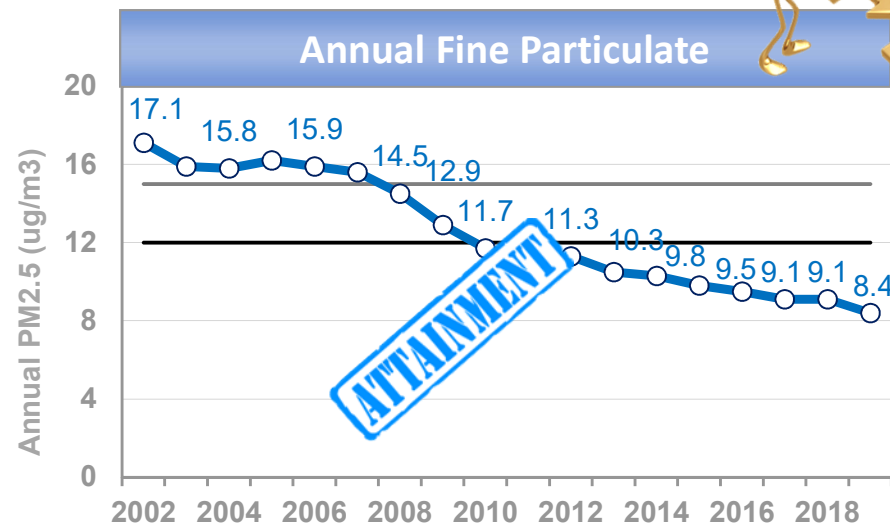
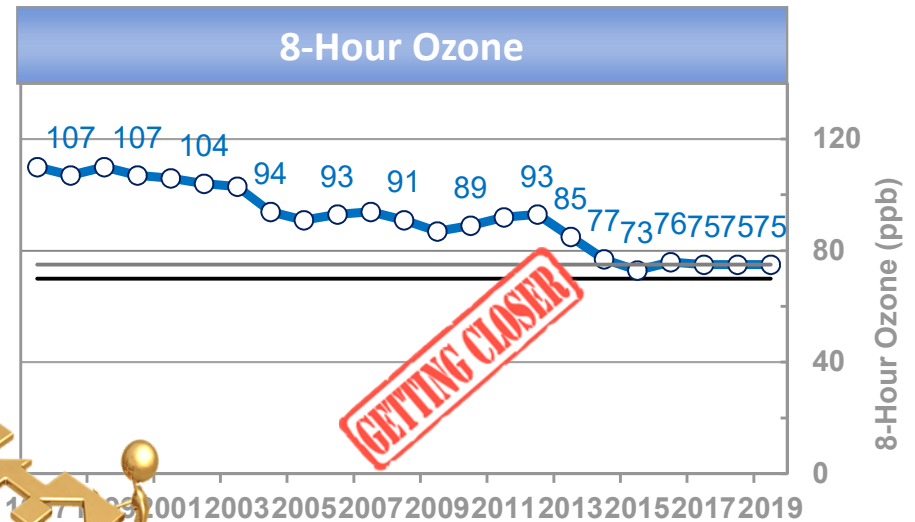
Exceedance Days



\* 2019 data is preliminary 9



# Progress in Cleaning Maryland's Air



What Have We Learned from All of This?

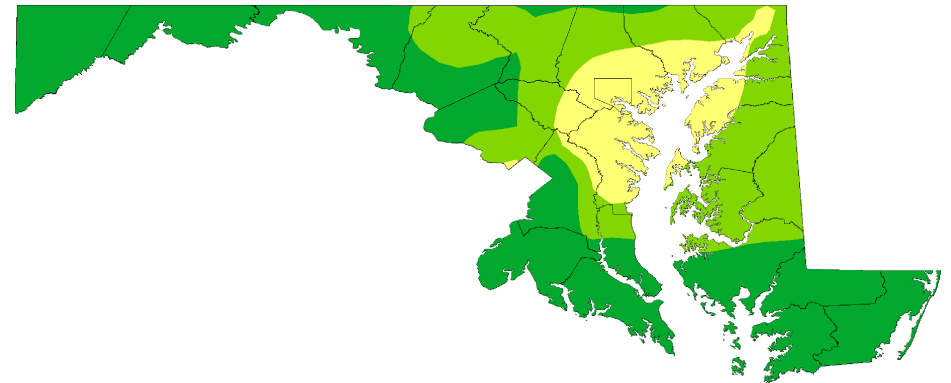
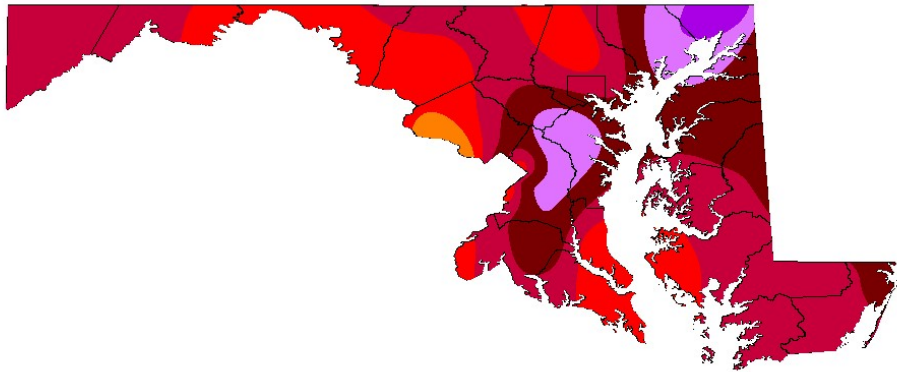
\* 2019 data is preliminary

# Shrinking Ozone

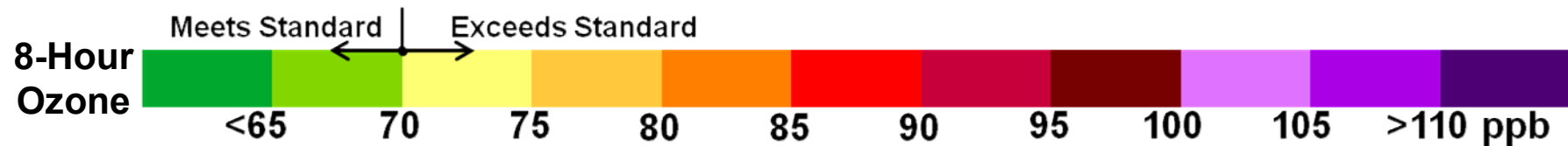


1998

2019\*



The Shrinking Ozone Problem: Not just the magnitude, but its nature: “We’re going local”

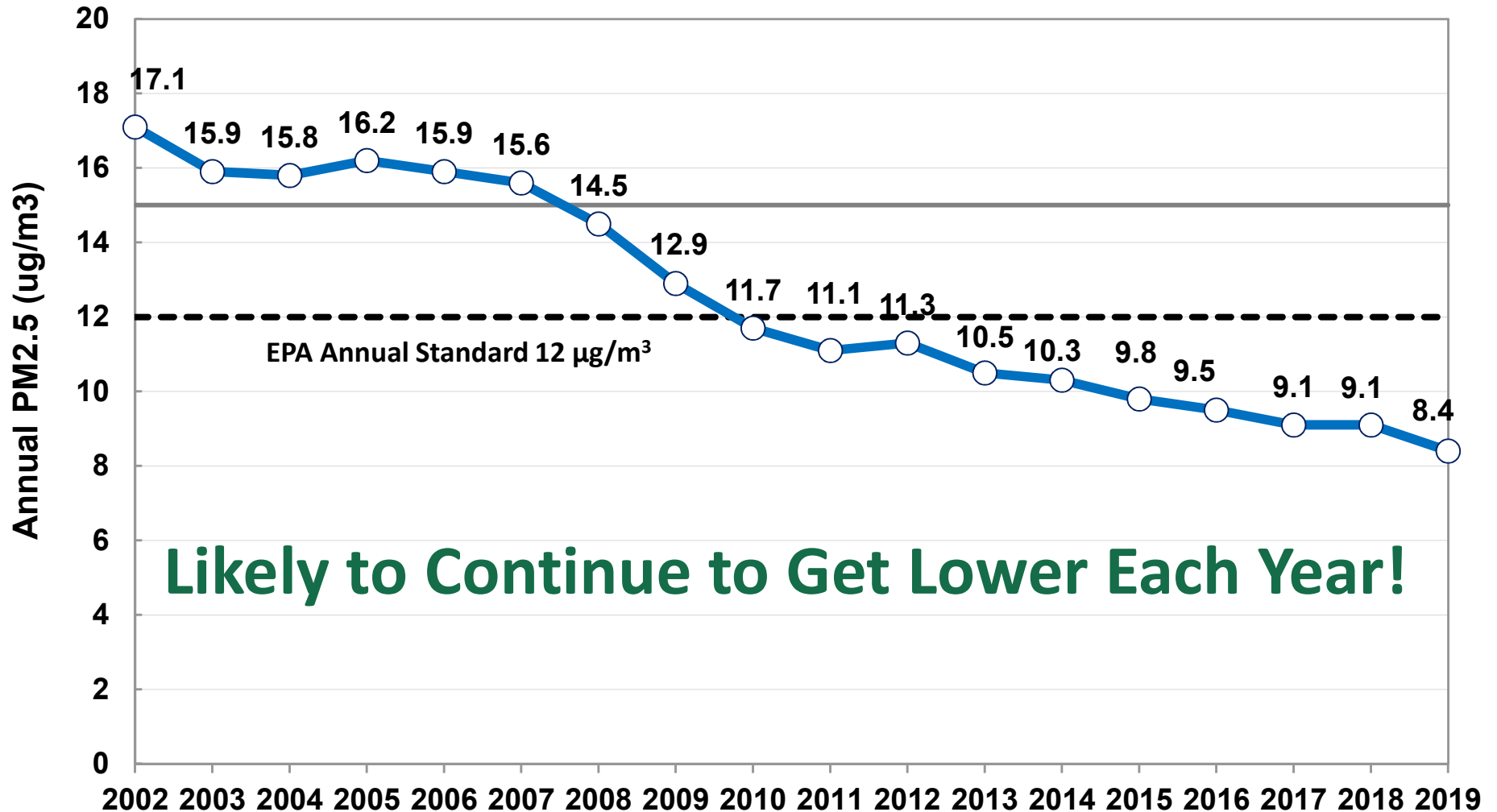


\*Preliminary Data: Subject to Change



# Fine Particle Air Pollution

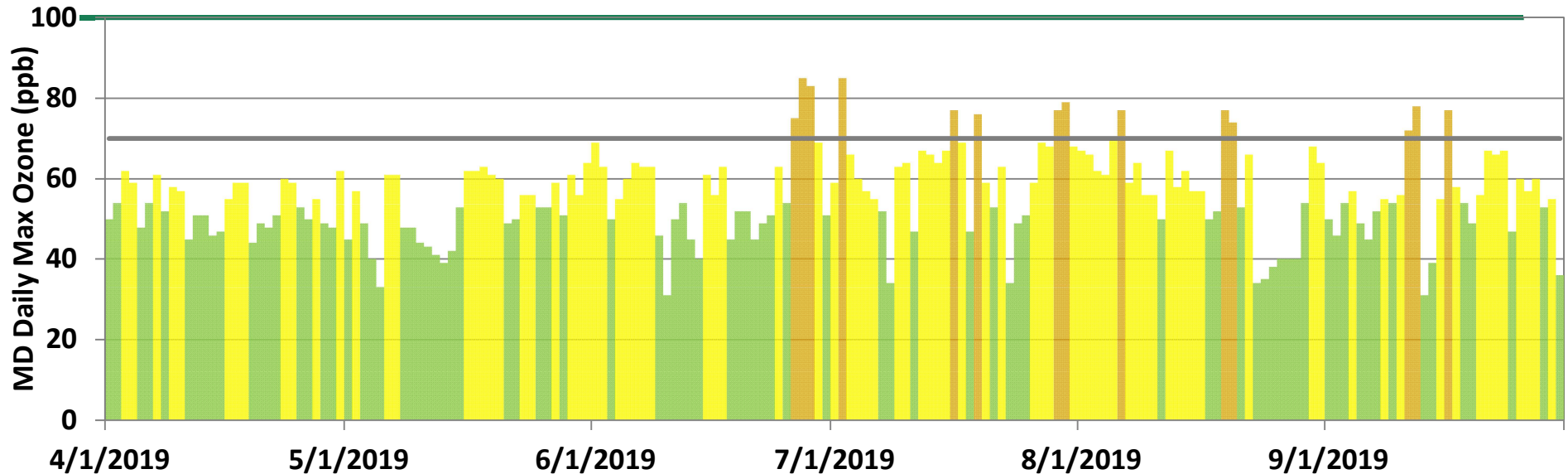
## *Lower Levels Across the State*



\* 2019 data is preliminary



# 2019 SEASON AT A GLANCE



- 2019: 14 Exceedance Days
  - Second fewest ever
- Near record warmth
- Wet/Active pattern for most of Maryland and Mid-Atlantic during first half, dry second half
- Randomness continues...

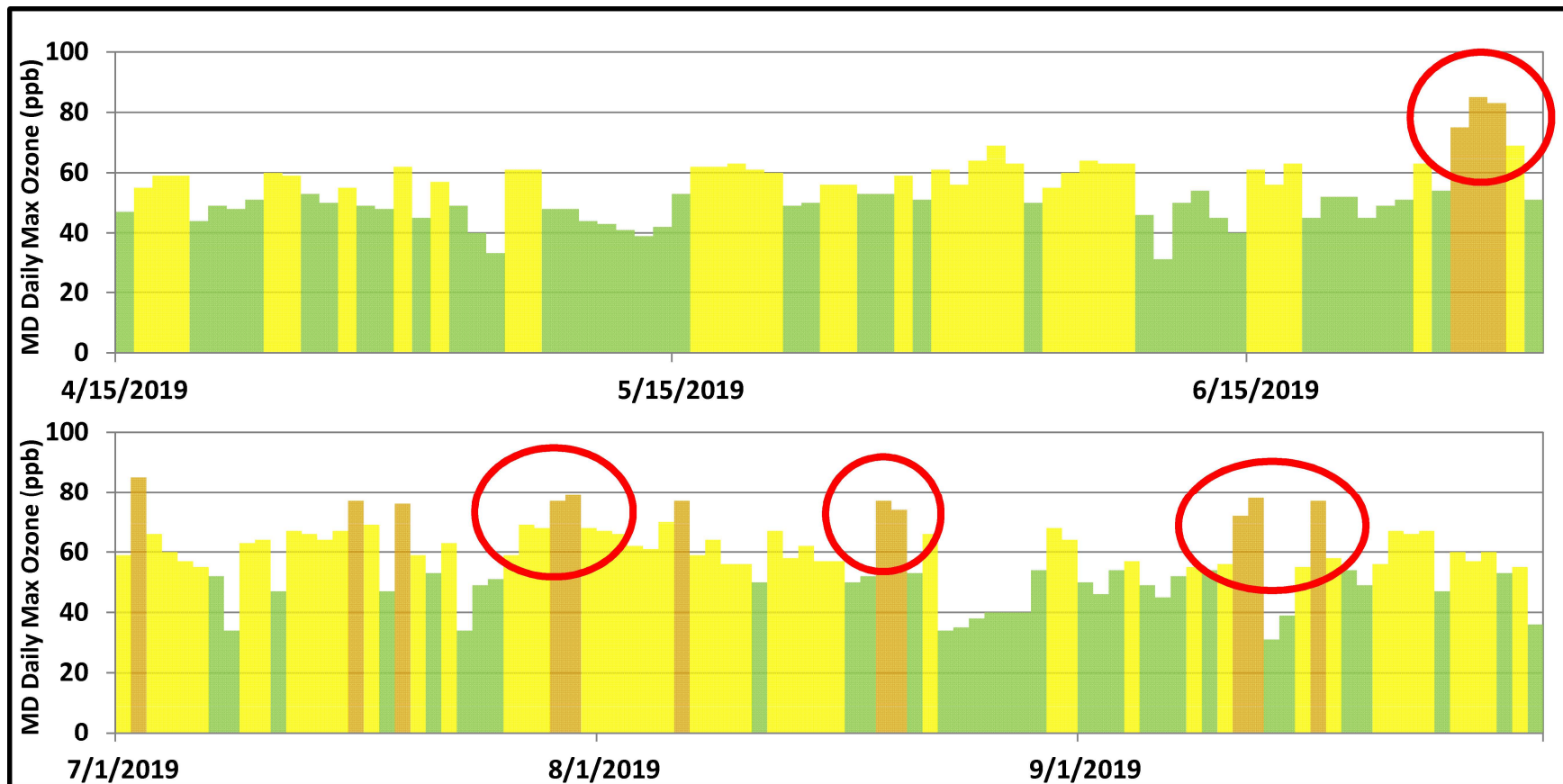
\* 2019 data is preliminary



# Peak Days are Often Bunched

## *Really not 14 individual events*

### Maryland's Ozone Air Quality – Summer 2019



\* 2019 data is preliminary 14



# 2019 PEAK DAY PARTNERSHIP

*HOW THE PROGRAM WORKS*



# The Program in Four Simple Steps

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1. We forecast that bad ozone is expected in MD
  - 2020 Ozone forecasting will be starting on April 13th and end around September 25th
  
2. We send partners notices:
  - Multi-day advance warning notice when we can
  - Call To Action Notice for next day
  
3. We ask Partners do what they can... extra action... that is reasonable... to help reduce nitrogen oxide (NO<sub>x</sub>) emissions on a few days each summer... send operational data to MDE
  
4. We attain the standard
  - Less risk to the public health
  - Less regulatory burden on partners





# MDE's Ask of Existing Partners

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- Our basic ask: Continue to do everything you can to minimize NOx emissions on the day of ... and the days leading up to ... forecasted ozone exceedances
- Our simple specific asks:
  - For units subject to the emission reduction optimization requirements of COMAR 26.11.38.03A(2) ... please make all reasonable efforts to run at rates that are at or below the indicator rates listed at 26.11.38.05A(2)
  - For Municipal Waste Combustors (MWC), optimize the use of your current control technologies to minimize NOx emissions and make all other reasonable efforts to reduce NOx emissions
  - For other units that are not subject to COMAR 26.11.38, MDE asks that they not operate or limit their operating time, and make all reasonable efforts to minimize NOx emissions if required by PJM to operate
  - Report to MDE after each call-to-action notice



# MDE's Ask of New Partners

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## *Curtailment Service Providers*

- Our basic ask: Do everything you can to minimize NOx emissions from your clients on the day of... and the days leading up to... forecasted ozone exceedances
- MDE ask for CSPs:
  - Do not advise clients to perform any type of testing for on-site generators
  - Do not advise clients to operate on-site generators
    - Unless there is a true energy emergency
  - Advise clients to take any other reasonable actions that can be performed to reduce NOx emissions
  - Report to MDE after each call-to-action notice



# An Ask of PJM

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- PJM is a different kind of partner
- They are not regulated by MDE and do not directly emit or advise clients that may emit
- It is our understanding that PJM may soon begin asking companies that participate in demand response programs to “test” their response program on specific days
- We assume that PJM will not ask for tests on days where an MDE action day has been called
- If this is not true, it is important to make sure that the “system” testing called for by PJM is not misunderstood by participants as an exemption from the goal of the MDE Peak Ozone Day Partnership Program ... to not run on-site generators on days where MDE has called for action
- On days when MDE has called for action, participants will have to respond to the PJM “system” test by using conservation and curtailment ... without operating on-site generators unless there is an emergency



# Data We Need from Sources After Each Call-To-Action Notice

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## Day After Reporting from Partners

- Work with your MDE contact - Data in EXCEL spreadsheet form including hours operated, hourly averages for the forecast day of NO<sub>x</sub> Rate, MWg generated and Heat Input (MMBTU), and urea injection rate as applicable
- Include any notes - malfunctions, extra things done to minimize NO<sub>x</sub>, avoided NO<sub>x</sub> emissions, etc.
- Include the tons of NO<sub>x</sub> generated during the event
- For CSPs, please indicate that clients were not called to test or operate on-site generators
  - If on-site generators operated, provide reason, hours of operation and the tons of NO<sub>x</sub> generated during the event
- MDE will monitor PJM actions via PJM web site





# Units in the Peak Day Program

Unit	COMAR 26.11.38 (MDs Optimization Reg)	MWC	Other Unit
Brandon Shores Units 1 and 2	×		
Chalk Point Units 1 and 2	×		
Chalk Point Unit GT2			×
Dickerson Units 1, 2, and 3	×		
H.A. Wagner Units 1, 2, 3 and 4	×		×
Morgantown Units 1 and 2	×		
Morgantown GT3, GT4, GT5, and GT6			×
Perryman CT1, CT3 and CT4			×
Vienna 8			×
Westport CT5			×
Montgomery County RRF		×	
Wheelabrator Baltimore, LP		×	

Total - 29 units that are likely to impact the Baltimore, Washington and Philadelphia nonattainment areas



# CSPs in the Peak Day Program

Company	Active in 2019	Not active in 2019
AEP Energy Partners, Inc.		X
Constellation New Energy		X
CPower	X	
Energy Connect		X
Enel X	X	
Galt Power		X
Innovative Power		X
Mid Atlantic Power Partners		X
NRG Curtailment Solutions	X	
Tenaska Power		X
Viridity		X



# Sample Email Notices

## Peak Ozone Day Reduction Partnership Program Multi-Day Advance Notice

### *High Ozone Expected Soon!*

Thank you for your participation in MDE's 2020 Peak Ozone Day Reduction Partnership Program designed to reduce nitrogen oxide (NOx) emissions and lower ozone levels on peak ozone days.

Forecast conditions indicate rising ozone concentrations are expected to develop and an ozone air quality exceedance may occur in Maryland on [insert day, date]. Advance forecasts generally provide a good indication that an air quality exceedance may occur. 3-day public forecasts can be found on the MDE website at:  
<http://mde.maryland.gov/programs/Air/AirQualityMonitoring/Pages/index.aspx>

As part of this program, please begin thinking about implementing the measures described below to minimize emissions on and before the forecast exceedance day.

Please optimize current NOx emission control technologies to minimize NOx emissions and make all other reasonable efforts to reduce NOx emissions. If feasible, do not run units during peak ozone days or switch to cleaner units.

For your units subject to the emission reduction optimization requirements of COMAR 26.11.38.03A(2), please make all reasonable efforts to run at rates that are at or below the indicator rates listed at COMAR 26.11.38.05A(2).

For Curtailment Service Providers (CSPs), do not advise clients to test or operate on-site generators, unless there is a true energy emergency. Advise clients to take any other reasonable actions that can be performed to reduce NOx emissions.

MDE will issue a Call to Action if the forecast continues to indicate that an air quality exceedance is likely to occur. Any additional efforts to minimize TOTAL NOx emissions prior to the anticipated exceedance day would be greatly appreciated.

If you have any questions about the Peak Ozone Day Reduction Partnership Program contact Randy Mosier at 410-537-4219 or [randy.mosier@maryland.gov](mailto:randy.mosier@maryland.gov).

Please do not respond directly to this e-mail. The originating e-mail account is not monitored.

## Peak Ozone Day Reduction Program Call-to-Action Notice

### *Curtail NOx Emissions Tomorrow if Possible!*

Thank you for your participation in MDE's 2020 Peak Ozone Day Reduction Partnership Program designed to reduce nitrogen oxide (NOx) emissions and lower ozone levels on peak ozone days.

An ozone air quality exceedance day is forecast to occur in Maryland tomorrow, [insert day, date]. As requested, MDE is asking you to take all reasonable steps to minimize NOx emissions. Taking actions to minimize NOx emissions the day before and the day of a predicted ozone exceedance helps to reduce the possibility of poor air quality occurring in the region.

At a minimum, MDE is asking you to consider implementing the measures described below:

Please optimize current NOx emission control technologies to minimize NOx emissions and make all other reasonable efforts to reduce NOx emissions. If feasible, do not run units during peak ozone days or switch to cleaner units.

For your units subject to the emission reduction optimization requirements of COMAR 26.11.38.03A(2), please make all reasonable efforts to run at rates that are at or below the indicator rates listed at COMAR 26.11.38.05A(2).

For Curtailment Service Providers (CSPs), do not advise clients to test or operate on-site generators, unless there is a true energy emergency. Advise clients to take any other reasonable actions that can be performed to reduce NOx emissions.

Any efforts to minimize TOTAL NOx emissions would be greatly appreciated.

MDE kindly requests a summary report in Excel format the day following each Call to Action. In the report, please submit the hourly operating data for each Call to Action Day including: hourly averages of NOx Rate, MWg generated (as applicable), Heat Input (MMBTU), and urea injection rate (as applicable). Please also provide the daily NOx tons emitted. Note any special actions taken to minimize NOx emissions and note any malfunctions impacting NOx emissions during Call to Action days. If possible, include the anticipated reduction in NOx emissions attributable to actions taken. For CSPs, please indicate that clients were not called to test or operate on-site generators. If on-site generators operated, provide reason, hours of operation and the tons of NOx generated during the event

Information may be sent to Susan Nash at [susan.nash@maryland.gov](mailto:susan.nash@maryland.gov).  
If you have any questions about the Peak Ozone Day Reduction Partnership Program contact Randy Mosier, MDE 410-537-4219 or [randy.mosier@maryland.gov](mailto:randy.mosier@maryland.gov).



# 2019 PEAK DAY PARTNERSHIP

*WHAT HAPPENED? WHO DID WHAT?*





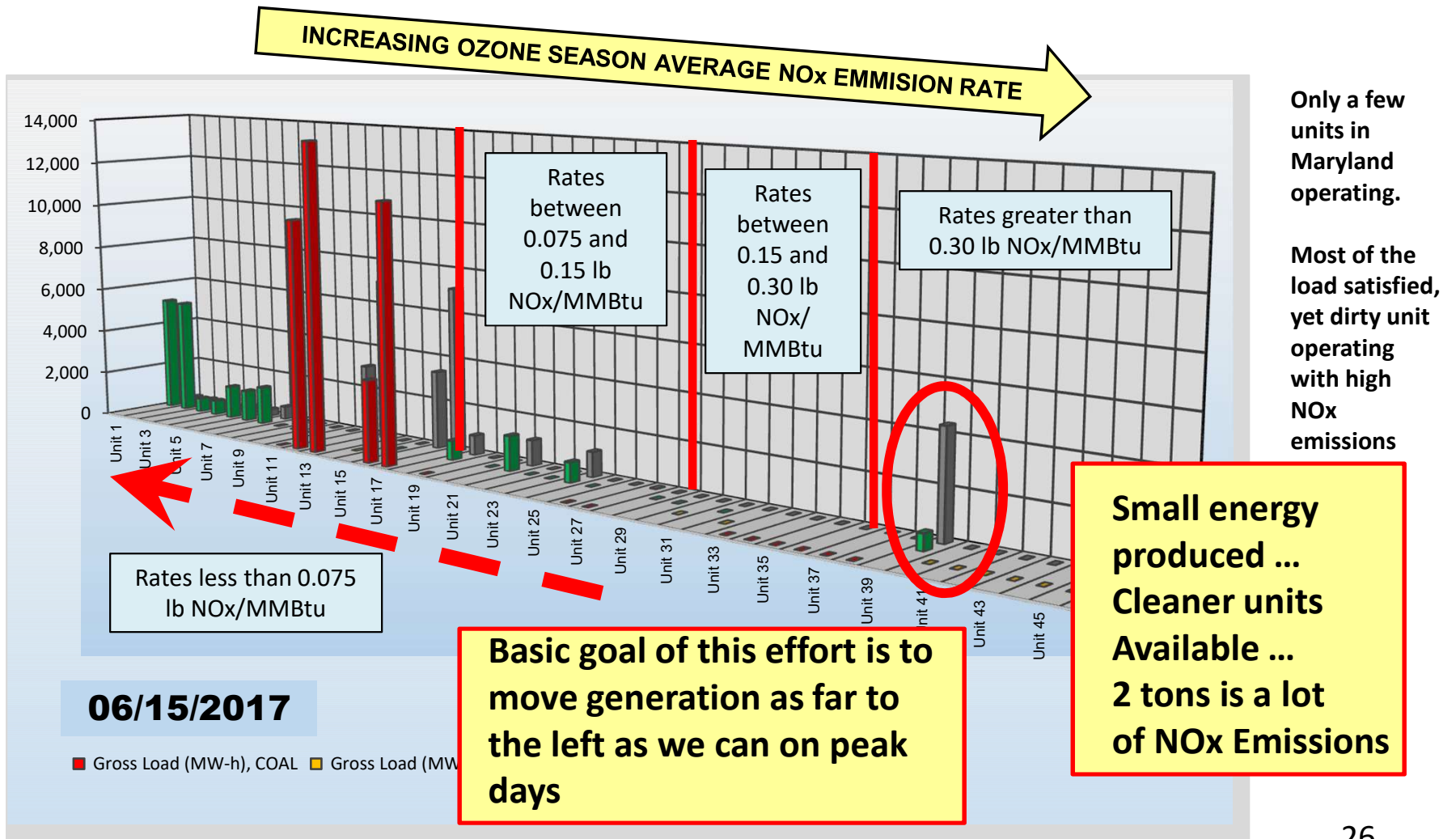
# Nine MDE Action Days Called

Date Forecast	Forecast MD Max O3 (ppb)	Actual MD Max O3 (ppb)
June 27 <sup>th</sup>	76	85
June 28 <sup>th</sup>	83	83
June 29 <sup>th</sup>	71	69
July 2 <sup>nd</sup>	71	85
July 3 <sup>rd</sup>	71	66
July 19 <sup>th</sup>	78	76
July 20 <sup>th</sup>	76	59
July 29 <sup>th</sup>	77	77
August 6 <sup>th</sup>	73	77



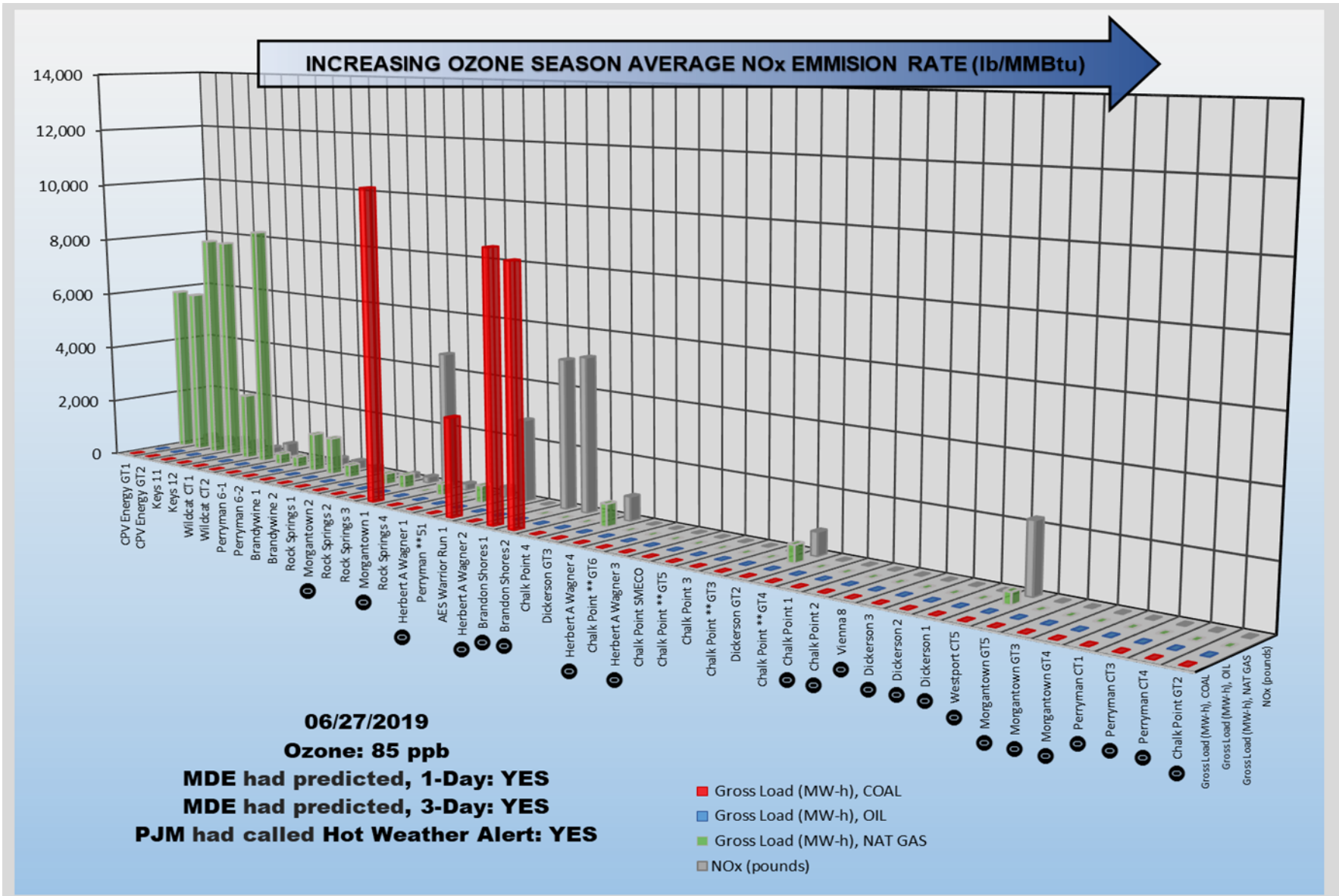
# Emissions Analyses

## Who Emitted ... At What Rates



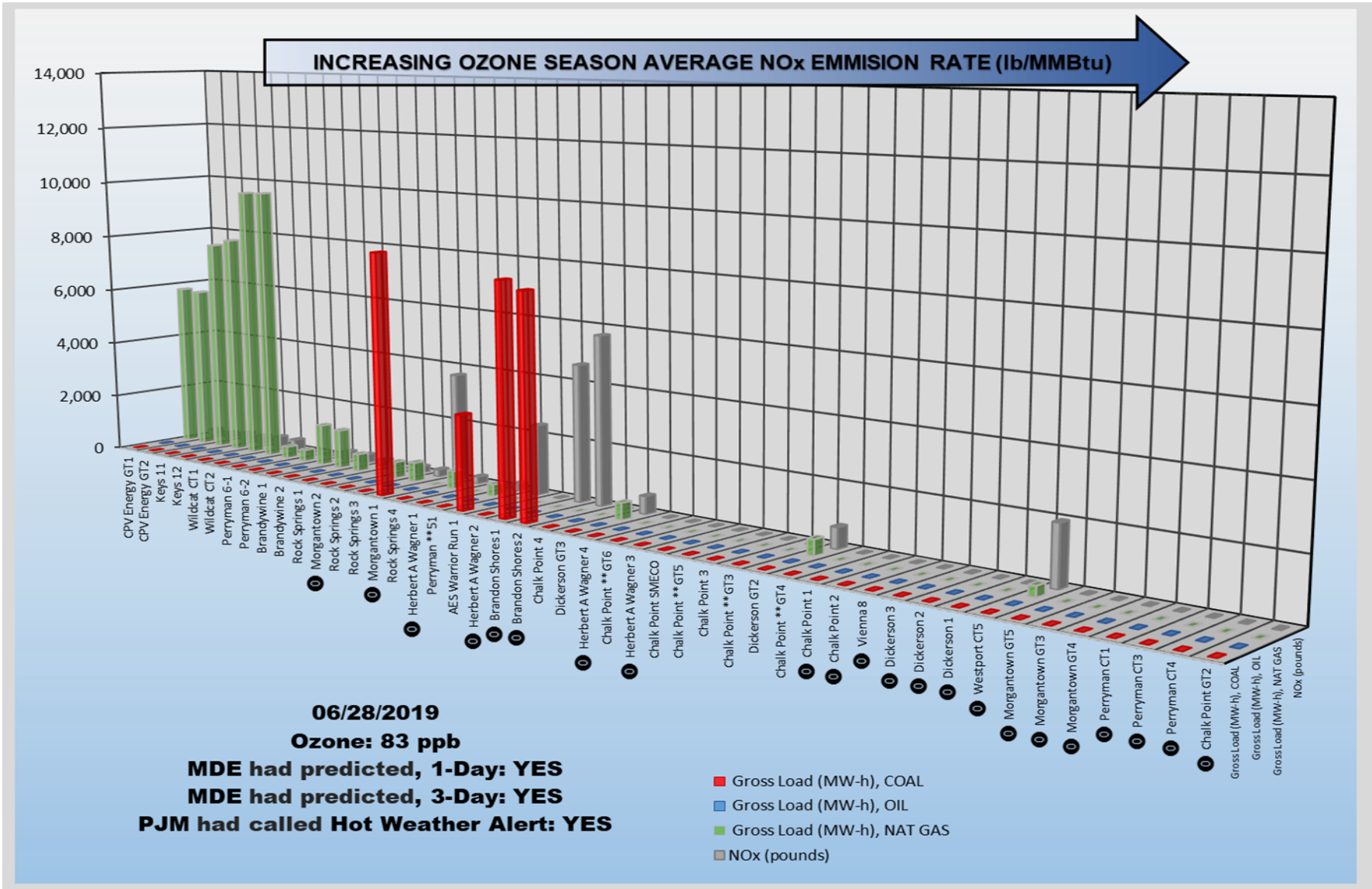


# June 27 - Are the Right Units Running?



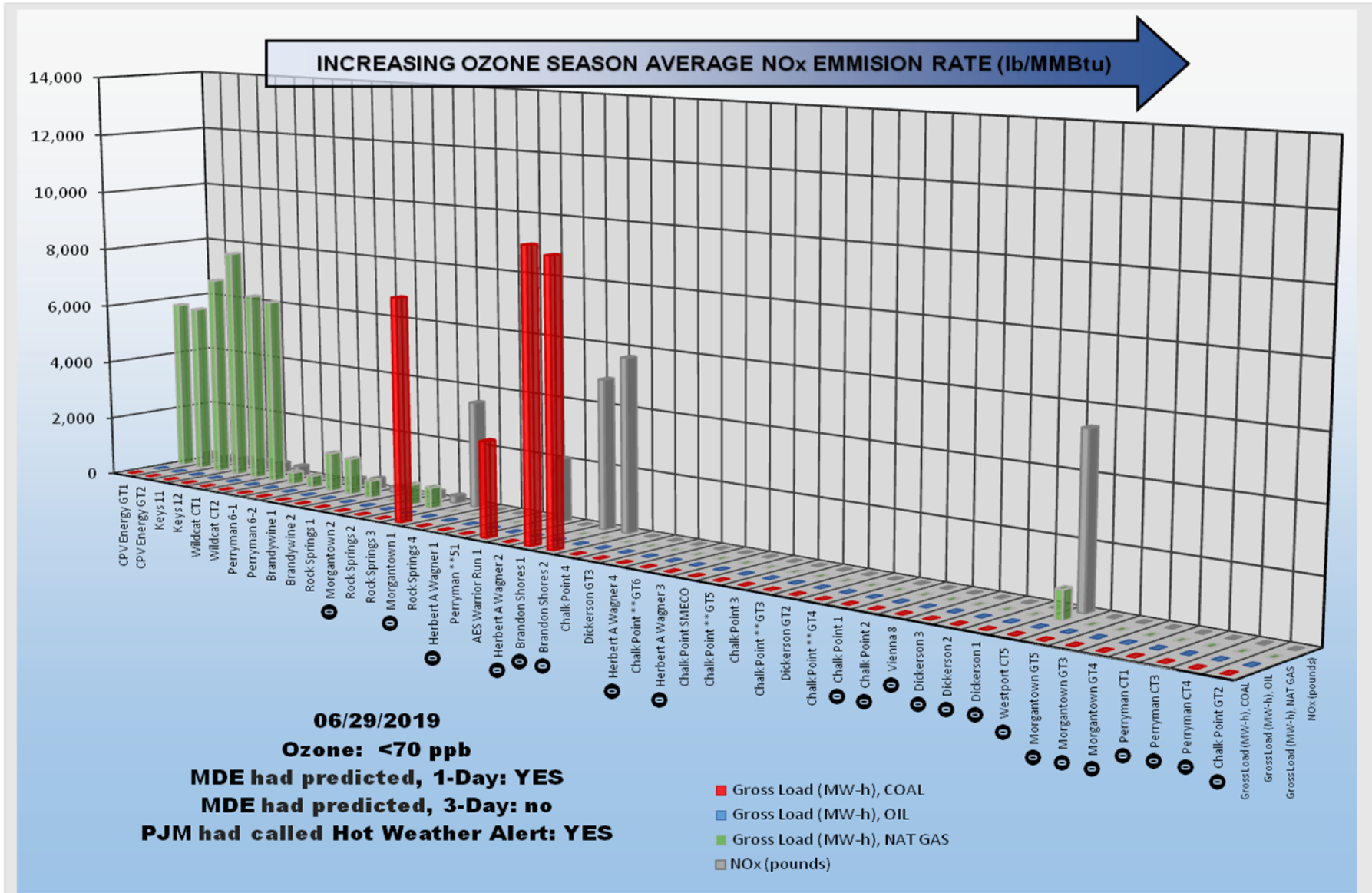


# June 28 - Are the Right Units Running?



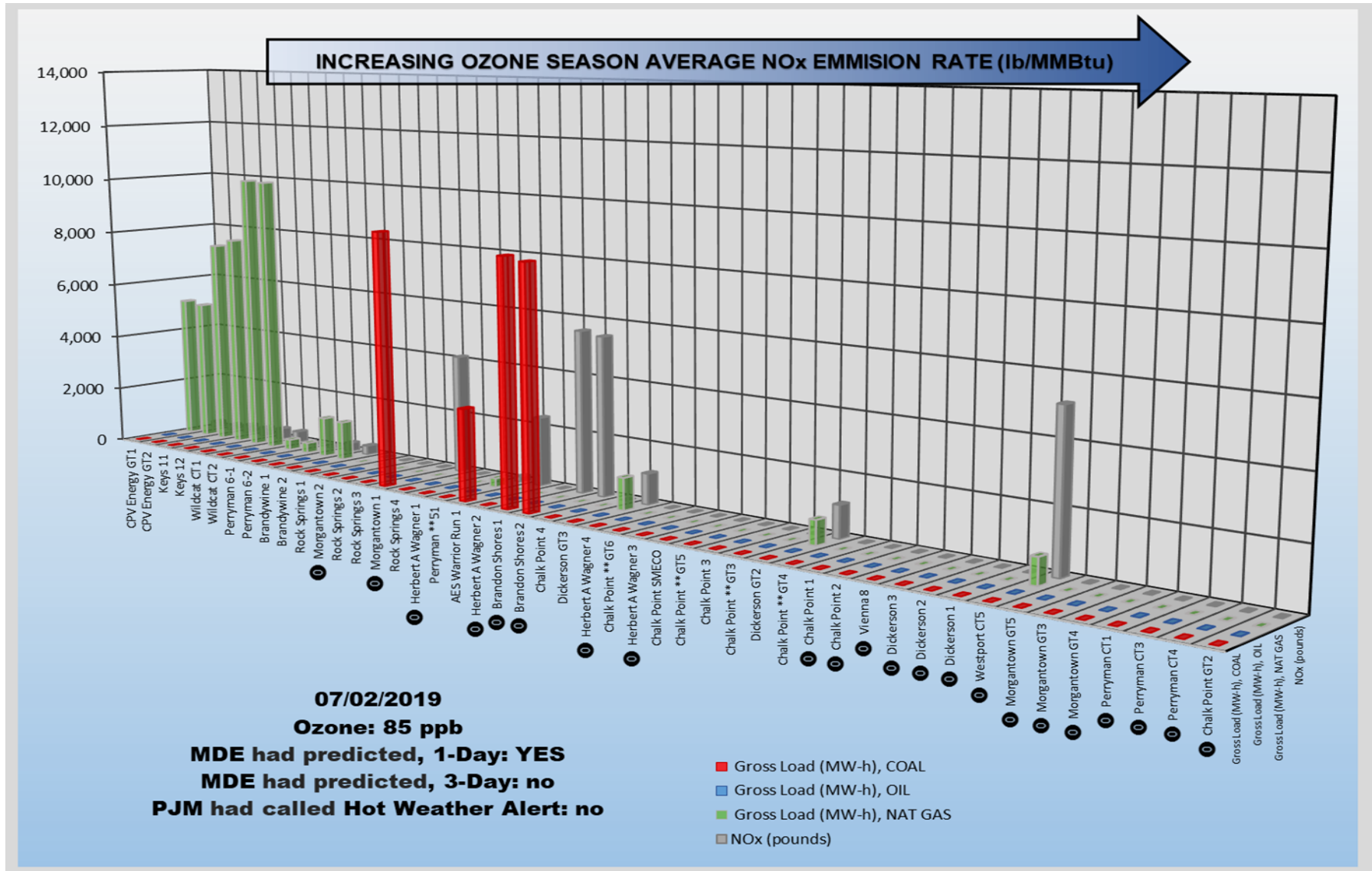


# June 29 - Are the Right Units Running?



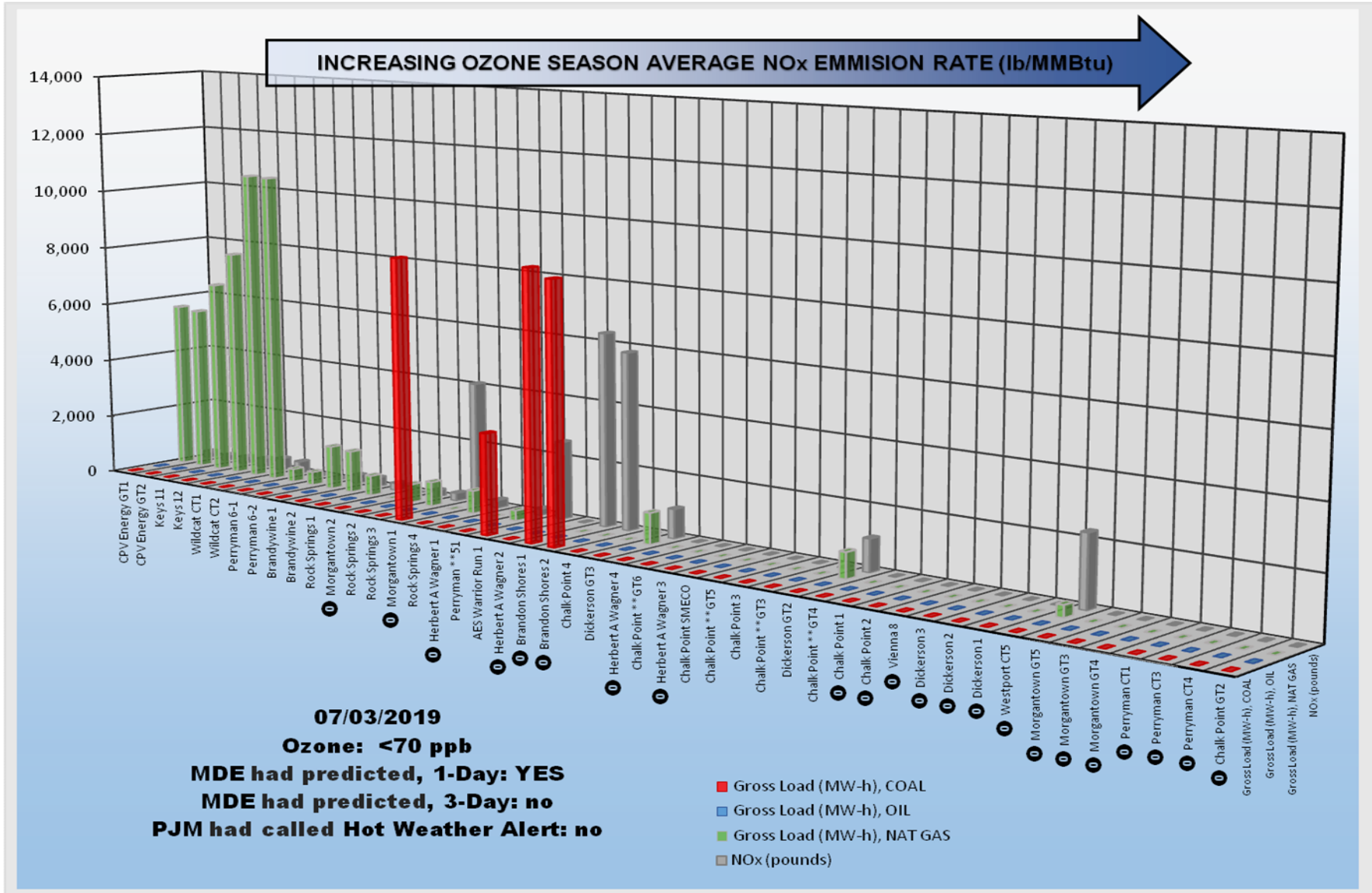


# July 2 - Are the Right Units Running?



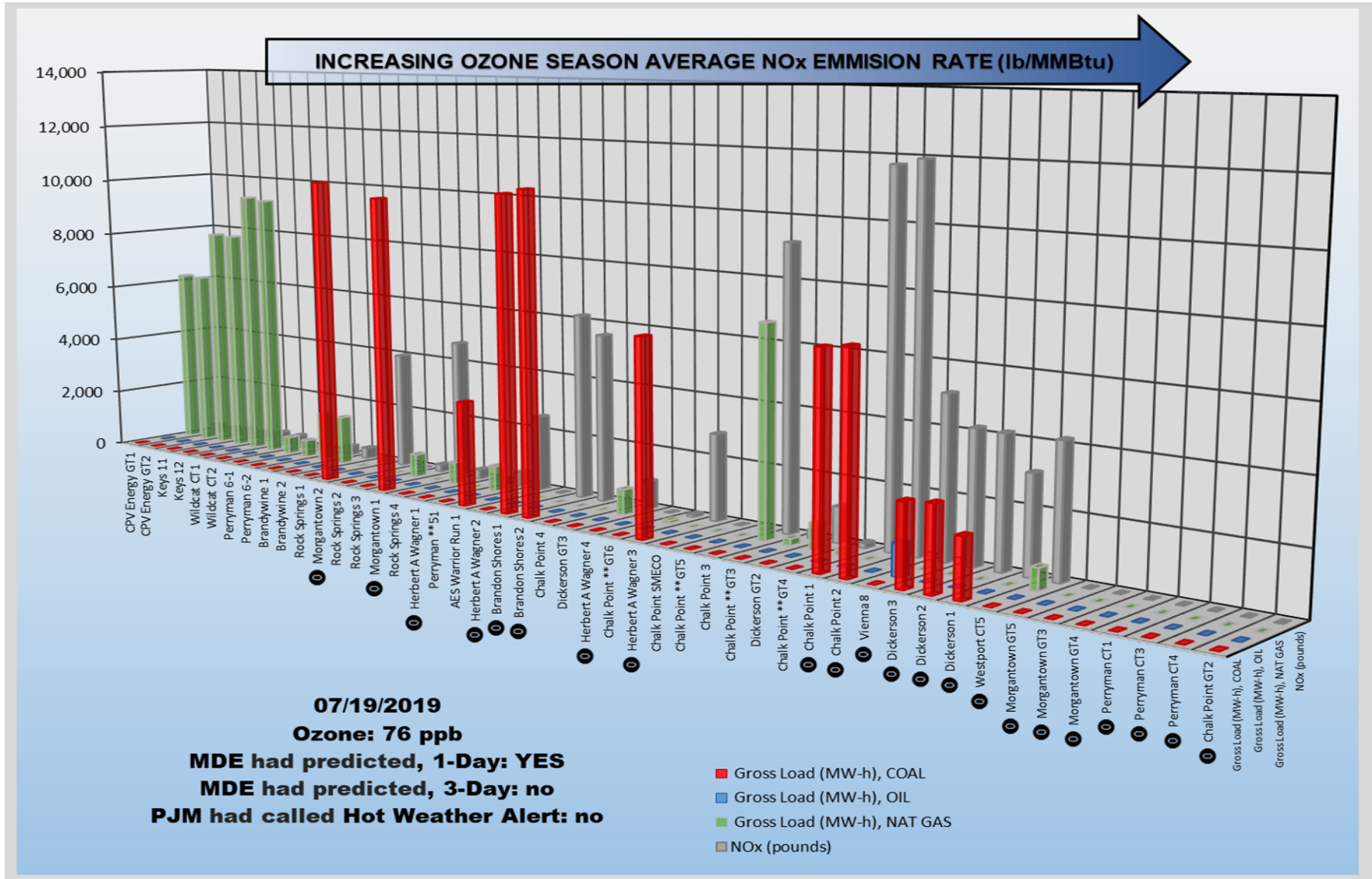


# July 3- Are the Right Units Running?





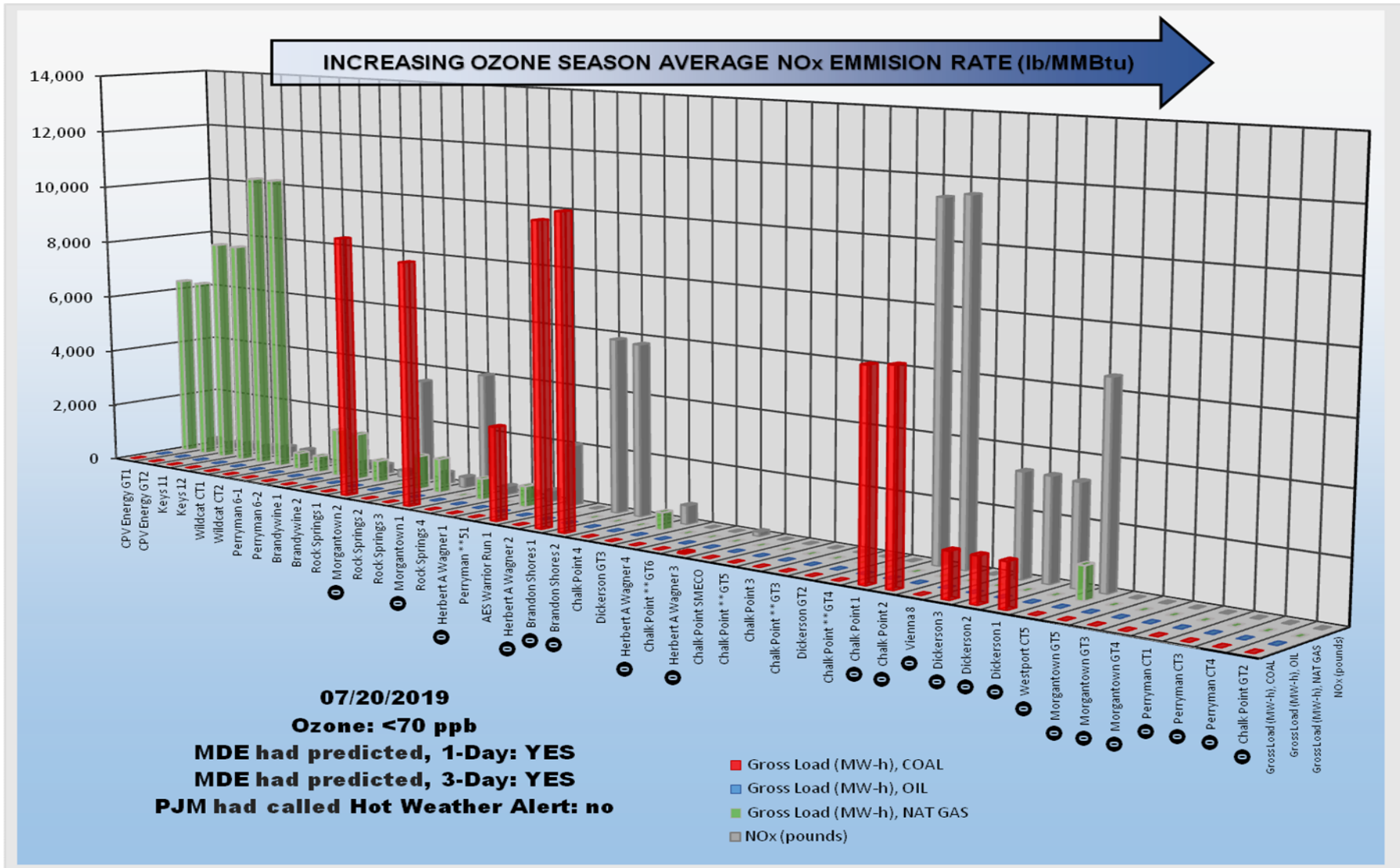
# July 19 - Are the Right Units Running?





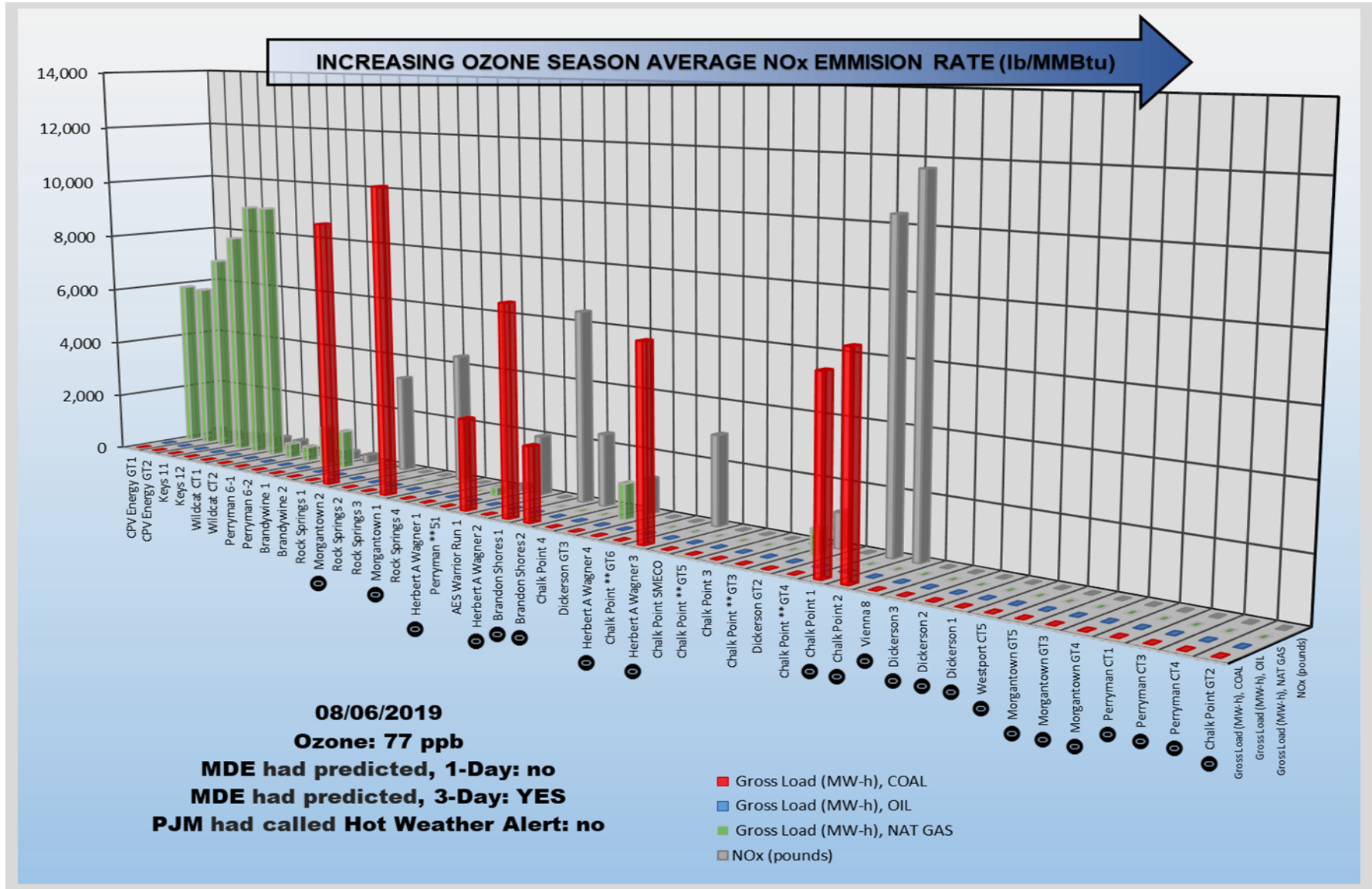


# July 20 - Are the Right Units Running?





# August 6 - Are the Right Units Running?



A bright sun shining through a blue sky with scattered white clouds. The sun is positioned in the upper right quadrant, casting rays across the sky. The clouds are fluffy and white, scattered across the blue background.

# 2020 REGULATORY HELPERS AND PJM DEACTIVATIONS



# 2020 Regulatory Helpers

- COMAR 26.11.38 - Control of NOx Emissions from Coal-Fired Electric Generating Units (EGUs)
  - By 2020 all coal-fired EGUs must:
    - Be controlled with state-of-the-art Selective Catalytic Reduction control technology ... or
    - Convert to natural gas ... or
    - Meet very stringent system wide emission limits equivalent to SCR controls on all units
  - These requirements are anticipated to push energy generation to cleaner units on peak ozone days





# 2020 Regulatory Helpers

- COMAR 26.11.08.10 - NO<sub>x</sub> Requirements for Large Municipal Waste Combustors
  - Beginning May 1, 2019 – Large MWCs began meeting updated NO<sub>x</sub> RACT 24-hour block average emission rates
  - Beginning May 1, 2020 – Large MWCs will meet new NO<sub>x</sub> RACT 30-day average emission rates to further ensure consistent long-term operation of NO<sub>x</sub> control technologies
- NO<sub>x</sub> control technologies under review for additional emission reductions at Large MWCs





# PJM Deactivation List

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- PJM has listed the following Maryland units for deactivation by June 1, 2020:
  - Westport 5
    - Operated 8 Peak Days in 2019
  - Wagner 2
    - Operated 1 Peak Day in 2019
    - Will no longer burn coal, but will continue to burn NG for on-site utilities
  - Notch Cliff GT1 – GT4
- Should increase reliance upon cleaner units operating during peak days

A bright sun is shining in a clear blue sky, with several white, fluffy clouds scattered across the scene. The sun is positioned in the upper right quadrant, creating a lens flare effect. The overall atmosphere is bright and positive.

**MOVING FORWARD**



# Moving Forward - Research

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- Research continues with a focus on local emissions, day specific meteorology and chemistry
- Other emission areas we are looking at during peak day ozone events include:
  - Terminals and Transmission
  - Commercial Marine Vehicles
  - Heavy Duty Diesel ... Airports ... Transportation Terminals
  - Mobile Sources
  - Industry with large NO<sub>x</sub> emissions
  - VOC Sources
- Data from our OWLETS research program is available
  - Research projects focusing on policy relevant conclusions are ongoing





# Moving Forward

## *Peak Day Partnership*

---

- We have added CSPs to the partnership in 2020
  - We look forward to your participation
- Over the past two years, many partners have made significant efforts to minimize NOx emissions on days where MDE has asked for additional efforts - We thank you
  - Others have not
- If we continue to see sources with high emission rates running on peak ozone days during the ozone season of 2020, we plan to move forward with “Peak Day” regulations



# Moving Forward

## *Potential Peak Day Regulation*

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- MDE email partners on this issue on August 2, 2019
- Concern that voluntary effort may not work for some sources
  - Small number of existing partners
  - A few events involving a few CSPs
- Regulation will be decided upon after the 2020 ozone season
- Regulatory outline in the webinar reminder email



# Basic Elements of a Potential Regulation

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- Likely to focus on a select number of sources or sectors
  - It is unlikely that the regulation would affect all small and large sources involved in the energy supply process
  - CSPs will be considered
  - Data from the summers of 2018, 2019 and 2020 will drive source coverage
- Would apply on any day forecasted to be a code yellow, orange, red or purple ozone day
  - May prohibit any covered generation unit with a NO<sub>x</sub> emission rate greater than something like 0.09 lb/MMBTU from operating
  - May prohibit CSPs from instructing clients to test or operate on-site generators
  - Will include provisions to address true energy emergencies

# *Questions ... Comments ... Discussion*

