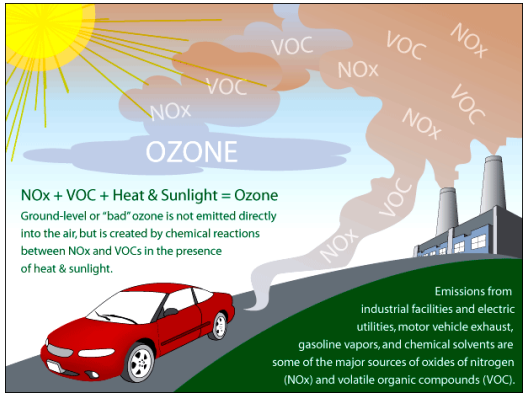
PLANNING FOR THE FUTURE PATHS TO ATTAINING 2008 & 2015 OZONE NAAQS

SIPRAC December 14, 2023
Bureau of Air Management

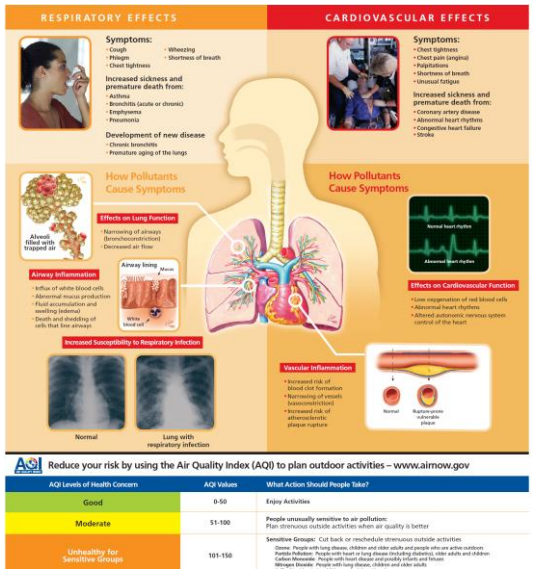
OZONE POLLUTION – PUBLIC HEALTH AND EQUITY

Ozone forms when precursors (NOx and VOC) react in sunlight during warmer months



Particulate Matter (PM) also impacts public health

Mobile Sources account for most air pollution in Connecticut



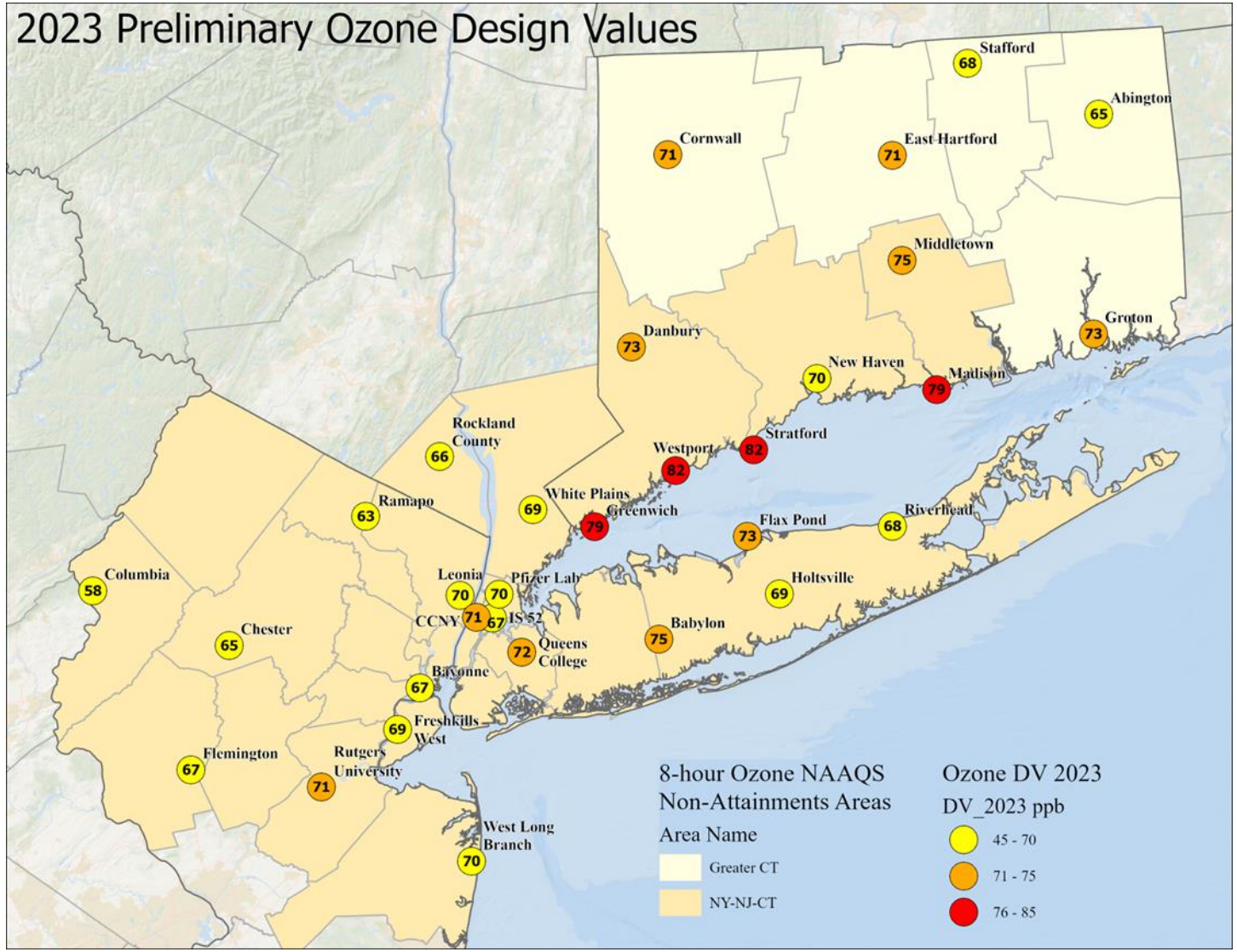
Breathing **ozone** triggers **health** problems; can reduce lung function and harm lung tissue. **Ozone** worsens bronchitis, emphysema, and asthma, leading to increased medical care costs and other economic impacts.

Connecticut - non-attainment for both the 2008 and 2015 8-hr ozone national ambient air quality standards (NAAQS) Fairfield, New Haven & Middlesex Counties now "severe" non-attainment for the 2008 NAAQS

AIR QUALITY PLANNING CYCLE

EPA Sets and States Implement the NAAQs for six pollutants on a five-year schedule

2023 OZONE DESIGN VALUES-PRELIMINARY



A design value is the average of the 4th highest monitored value from the previous three complete ozone seasons.

Westport and Stratford – 82

Groton – 73

2008 NAAQS – 75
2015 NAAQS - 70

NAAQS COMPLIANCE CHALLENGES AHEAD

	2008	2015
Moderate area SIPs for 11 reclassified Marginal areas	January 2017	--
Moderate area attainment date	July 2018	August 2024
Serious area SIPs for reclassified 2008 Moderate areas	August 2020	--
Serious area attainment date	July 2021	August 2027
1997 NAAQS revoked	--	--
Severe area attainment date	July 2027	August 2033

EPA's GN FIP modeling does not demonstrate CT reaching attainment by the Aug 2027 attainment date.

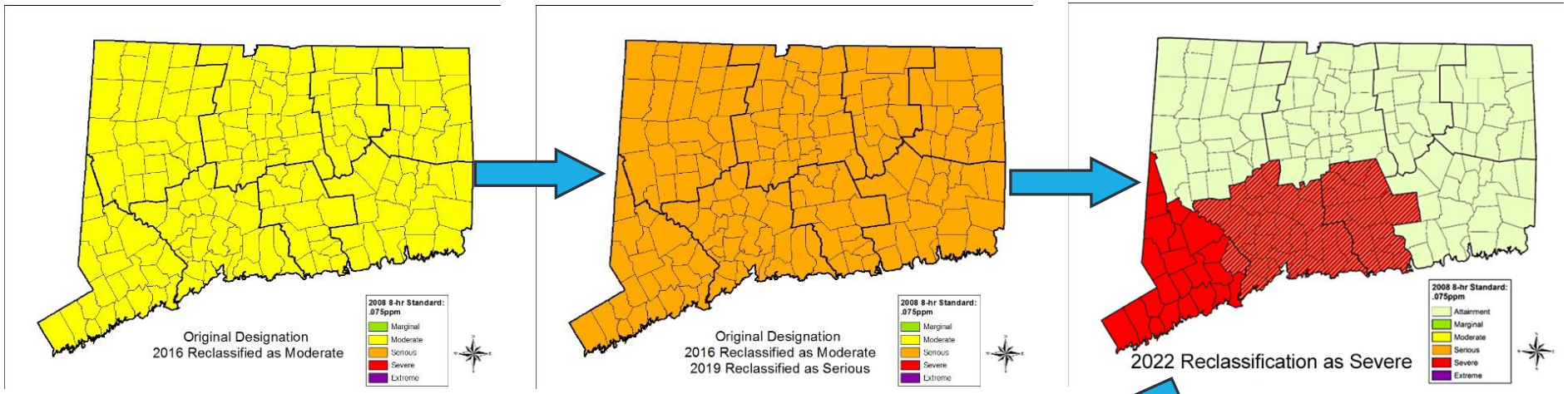
2008 OZONE NAAQS: HISTORY OF RECLASSIFICATION IN CT

Redesignation to Moderate June 3, 2016 → **SIP Revision Due Date** **Jan. 1, 2017** → **Attainment Date** July 20, 2018 → **Redesignation to Serious** September 23, 2019 → **SIP Revision Due Date** **August 3,** 2020 → **Attainment Date** **July 20, 2021**

Marginal nonattainment

Moderate nonattainment

Serious nonattainment



Severe Area Attainment Date July 20, 2027

Marginal | **Moderate** | **Serious** | **Severe**

2015 OZONE NAAQS: HISTORY OF RECLASSIFICATION IN CT

Initial Designations
August 3, 2018

Moderate SIP Revision Due Date
August 3, 2021

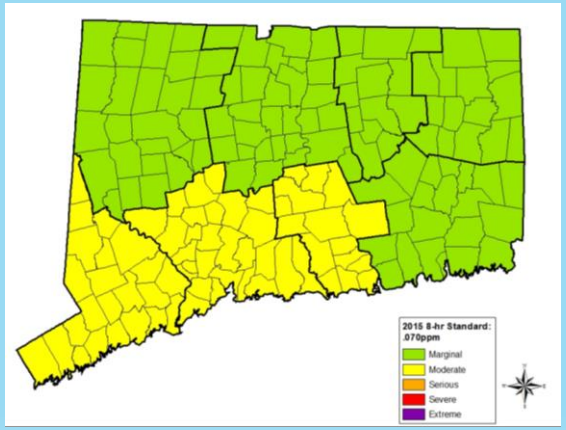
Marginal Attainment Date
August 3, 2021

ReDesignation to Moderate
November 7, 2022

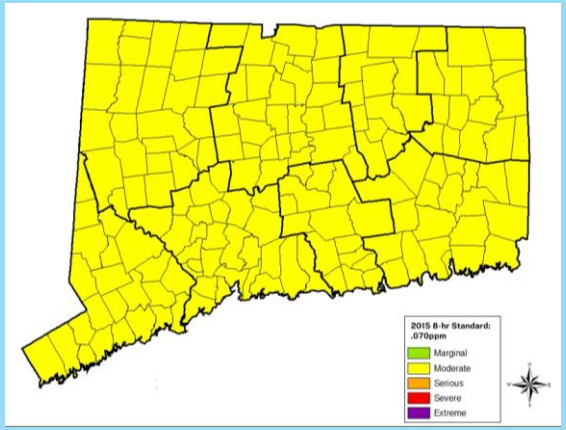
SIP Revision Due Date
January 1, 2023

Attainment Date
August 3, 2024

Marginal / Moderate nonattainment



Moderate nonattainment



Serious nonattainment

AIR PLANNING IMPACTS

For the 2008 Severe Nonattainment Area:

Attainment demonstration (modeling, nonattainment new source review (NNSR), clean fuels program, enhanced motor vehicle enhanced inspection and maintenance (I/M), reasonable further progress (RFP), contingency measures (CMs), Emission inventory, Emission statement, and enhanced ozone monitoring plan) – **Due by May 7, 2024**

Reasonably Available Control Technology (RACT) Demonstration (including revised major source threshold down to 25 tpy) – Due by May 7, 2024

Vehicle Miles Traveled (VMT) growth demonstration due to EPA by May 7, 2024

Based on this reclassification, a 185 Fee Program is due to EPA by November 7, 2025 (36 months after redesignation)

For the 2015 Moderate Nonattainment Area:

RACT (including major source, control technique guidelines (CTGs) and non-major source) – **Was due to EPA by January 1, 2023**

Attainment demonstration (including modeling, enhanced ozone monitoring, emission statement and inventory, NNSR, CMs, RFP and basic I/M*) – **Was due by Jan. 1, 2023**

Comment period underway:

Notice of Intent to Revise the State Implementation Plan for Air Quality 2015 Ozone NAAQS (ct.gov)

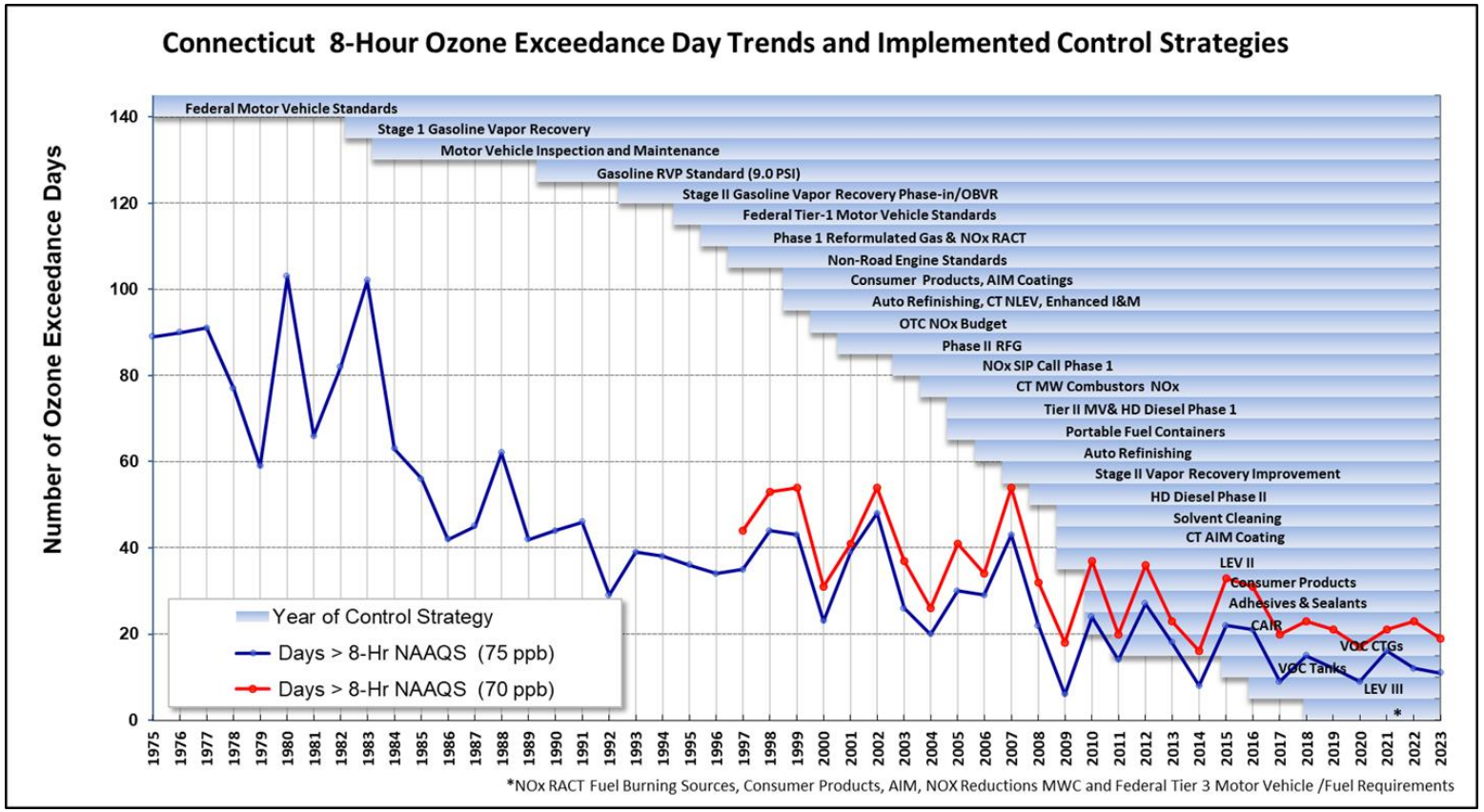
CONNECTICUT' PROGRESS IN MEETING THE OZONE NAAQS

If the 2008 ozone standard had been in place in the 1980s, CT would have exceeded it on over 100 days over the summer.

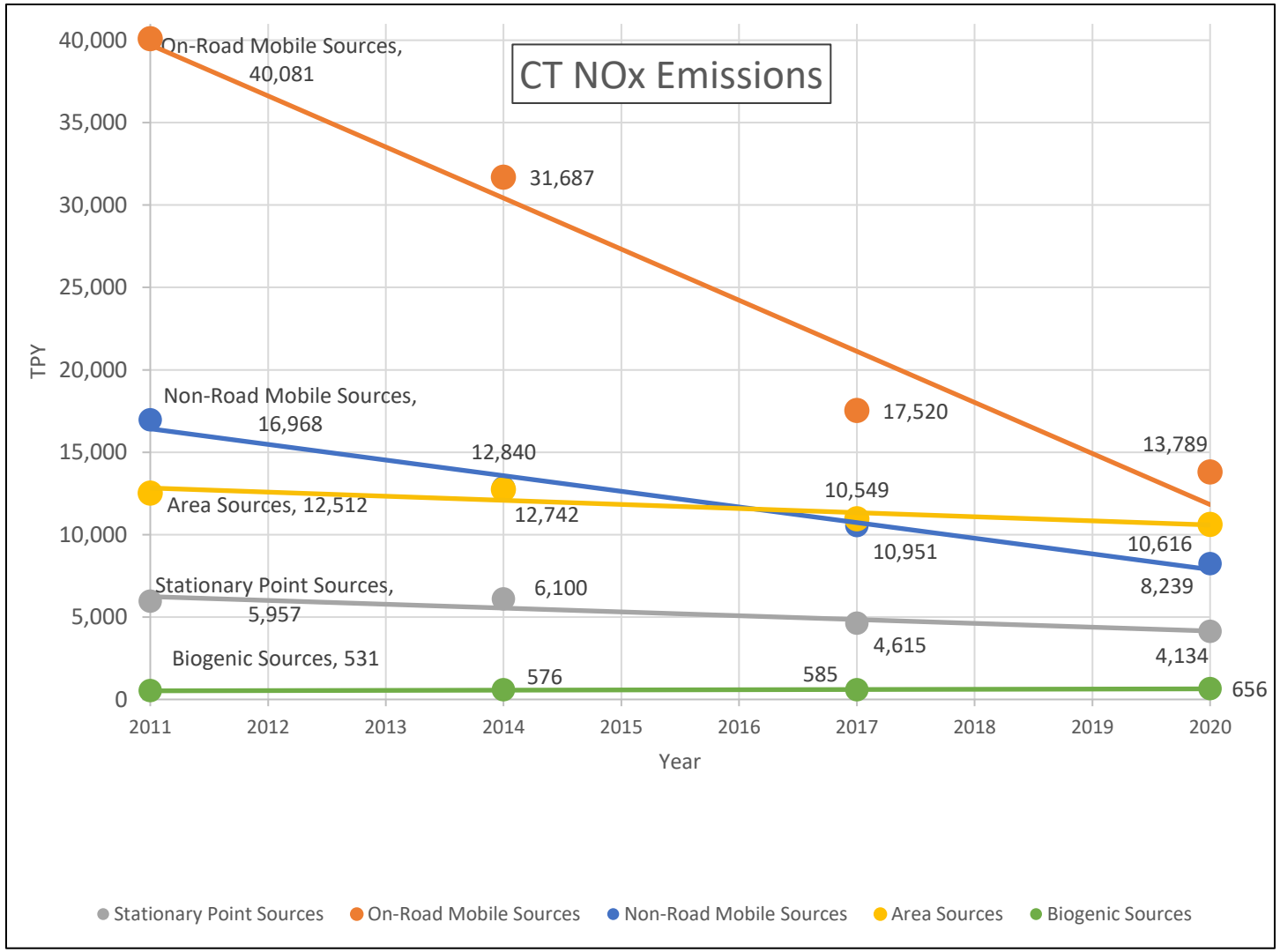
In recent years, CT has exceeded the 75 ppb 2008 standard much less frequently.

But... 19 days over the more protective 70 ppb standard in 2023 (red line)

Stagnating trends means we need to look for additional reductions



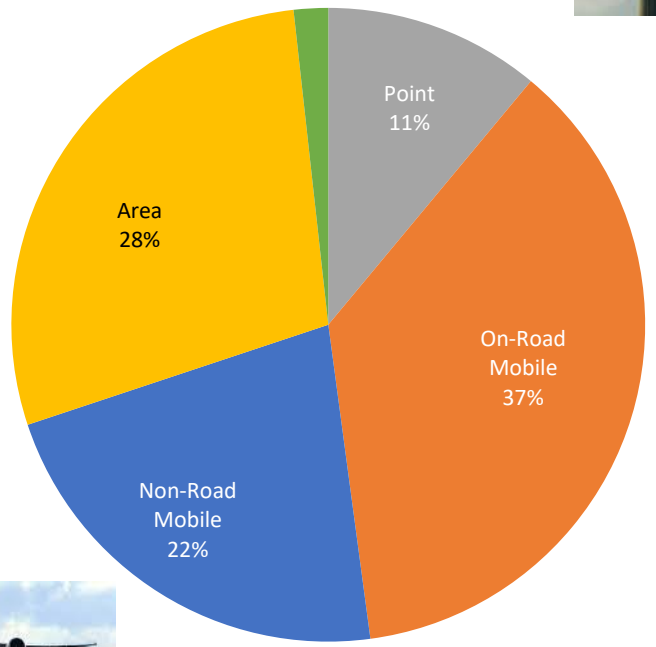
CT NO_X EMISSIONS OVER TIME (2011-2020)



NO_X Annual Emissions [TPY]	2011	2014	2017	2,020
Stationary Point Sources	5,957	6,100	4,615	4,134
On-Road Mobile Sources	40,081	31,687	17,520	13,789
Non-Road Mobile Sources	16,968	12,840	10,549	8,239
Area Sources	12,512	12,742	10,951	10,616
Biogenic Sources	531	576	585	656
Total	**76,049**	**63,945**	**44,220**	**37,434**

PERCENT NO_X EMISSIONS BY SECTOR (2020 NEI*)

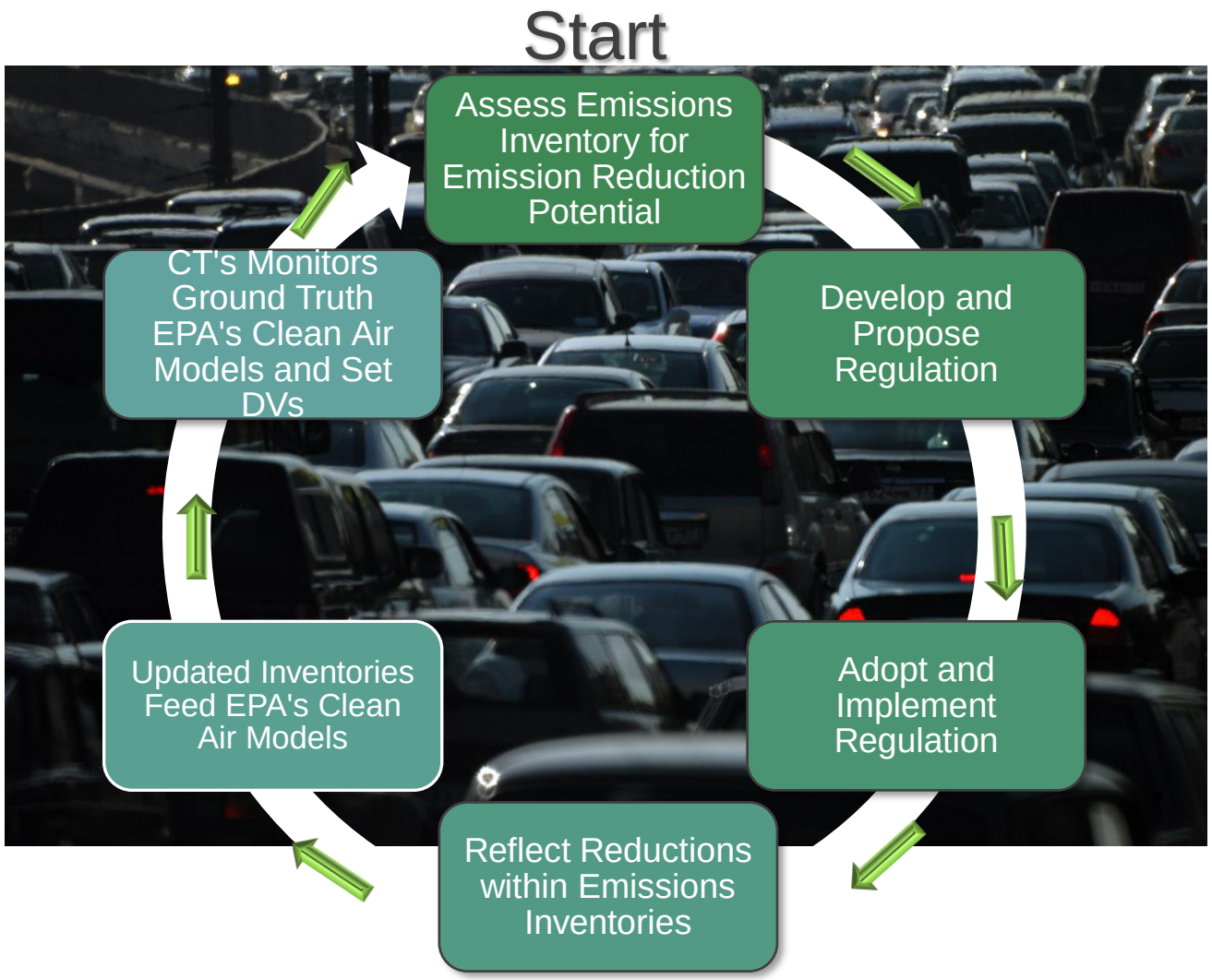
Despite significant reductions over past 10 years, mobile emissions still represent ~60% of statewide NOx emissions



Total 2020 NO_X=
37,434 TPY

***CT specific inventory may differ slightly from NEI values**

HOW WE GET SIP CREDIT FOR EMISSION REDUCTION STRATEGIES



Connecticut Department of Energy & Environmental Protection

WHAT WILL IT TAKE TO REACH OZONE ATTAINMENT IN CONNECTICUT?

EPA Letter to DEEP on Future Planning Efforts - *November 27, 2023*

12/14/2023

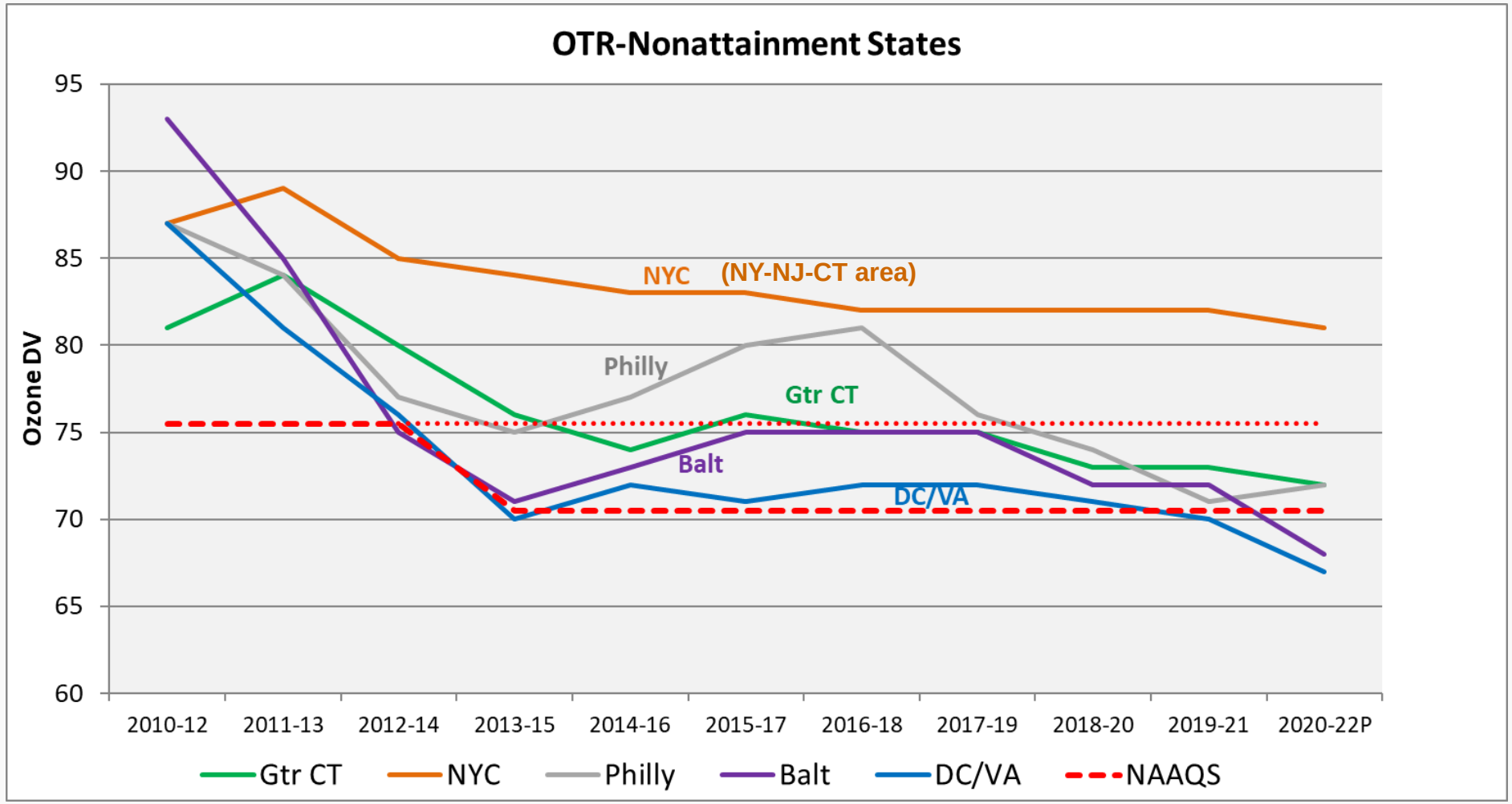
Reaching Attainment of the Ozone Standards in Connecticut

Eric Wortman & Bob McConnell
EPA Region 1
CT SIPRAC Meeting
December 14, 2023

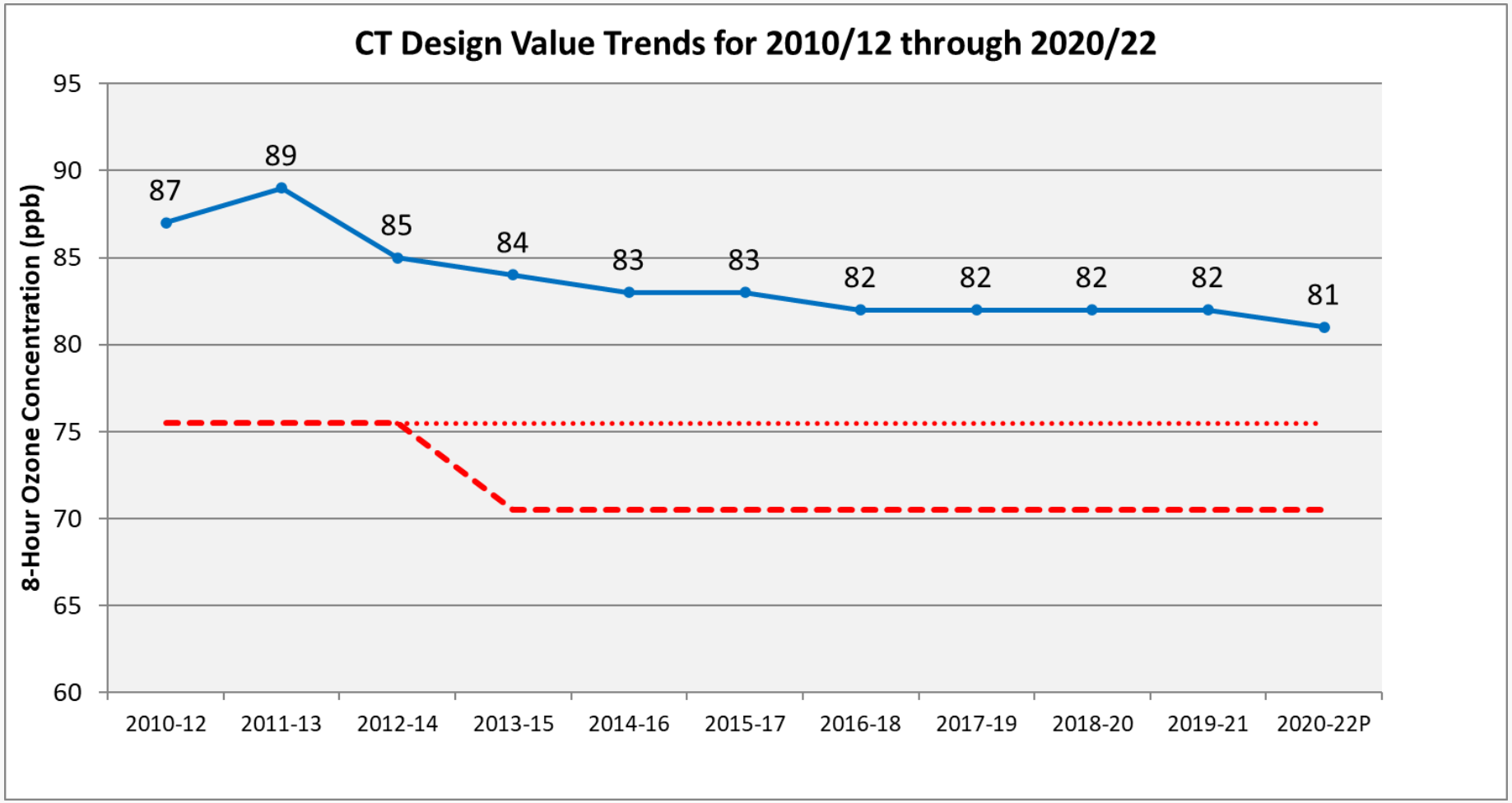
Items for today's discussion

1. Ozone trends in the Northeast
2. Substantial need for additional NOx reductions
3. Highest NOx emitting sectors in CT
4. EPA's requirements for reductions from upwind states
5. States and EPA need to work together to address problem
6. Possible additional emission reductions

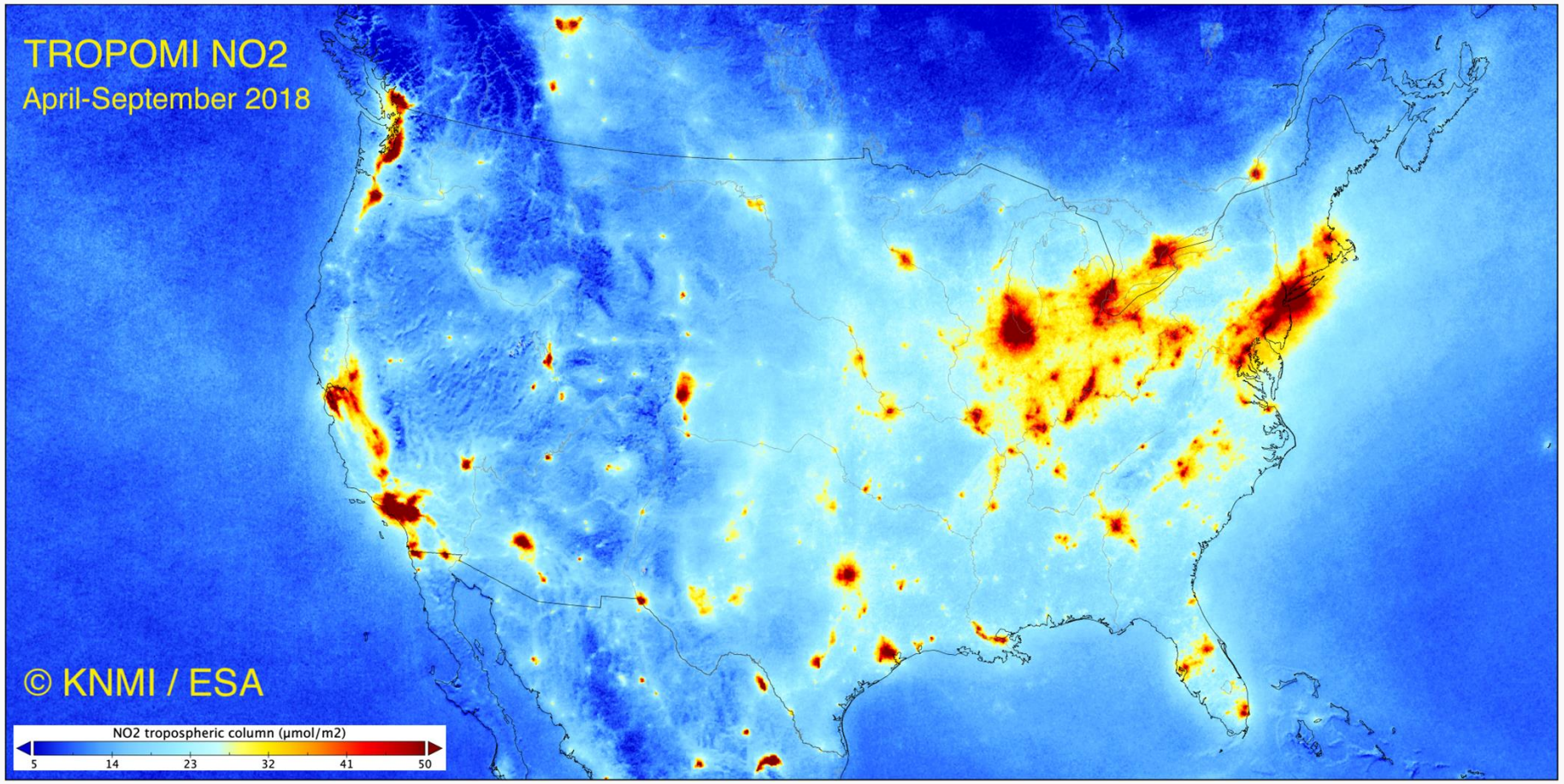
Ozone Trends in the Northeast



Ozone levels have stagnated over the past decade in CT



Substantial need for additional NOx reductions in the Northeast



Highest emitting NOx sectors in CT

Connecticut NOx emissions (2020) {from EPA's 2020 NEI}

SECTOR	POLLUTANT	EMISSIONS (tons/yr)	Percent of total
Mobile - On-Road Diesel Heavy Duty Vehicles	Nitrogen Oxides	6,497	17.7%
Mobile - On-Road non-Diesel Light Duty Vehicles	Nitrogen Oxides	6,373	17.3%
Mobile - Non-Road Equipment - Diesel	Nitrogen Oxides	3,887	10.6%
Fuel Comb - Residential - Oil	Nitrogen Oxides	2,656	7.2%
Fuel Comb - Comm/Institutional - Natural Gas	Nitrogen Oxides	2,468	6.7%
Waste Disposal	Nitrogen Oxides	2,375	6.5%
Fuel Comb - Residential - Natural Gas	Nitrogen Oxides	2,288	6.2%
Mobile - Non-Road Equipment - Gasoline	Nitrogen Oxides	2,067	5.6%
Fuel Comb - Electric Generation - Natural Gas	Nitrogen Oxides	838	2.3%
Mobile - Commercial Marine Vessels	Nitrogen Oxides	835	2.3%
Fuel Comb - Industrial Boilers, ICEs - Natural Gas	Nitrogen Oxides	817	2.2%
Mobile - Locomotives	Nitrogen Oxides	776	2.1%
Mobile - On-Road Diesel Light Duty Vehicles	Nitrogen Oxides	765	2.1%

EPA's requirements for reductions from upwind states

- Final "Good Neighbor" rule published on March 6, 2023 - Does not include all measures necessary to reach attainment, but simply prohibits "significant contribution" from upwind states.
- Upgrades made to transport rule now in place to keep pace with the current, more protective 2015 ozone NAAQS
- As promulgated, final rule identifies 23 states that are linked to downwind air quality problems for purposes of the Good Neighbor provision
- Determines required reductions in NOx emissions
  - 22 states will face requirements for Electric Generating Units (EGUs)
  - 20 states will face requirements for certain industrial source categories (non-EGUs)
- Establishes FIP requirements for states for which EPA intends to disapprove Good Neighbor SIPs or for states which EPA listed on the finding of failure to submit (FFS)

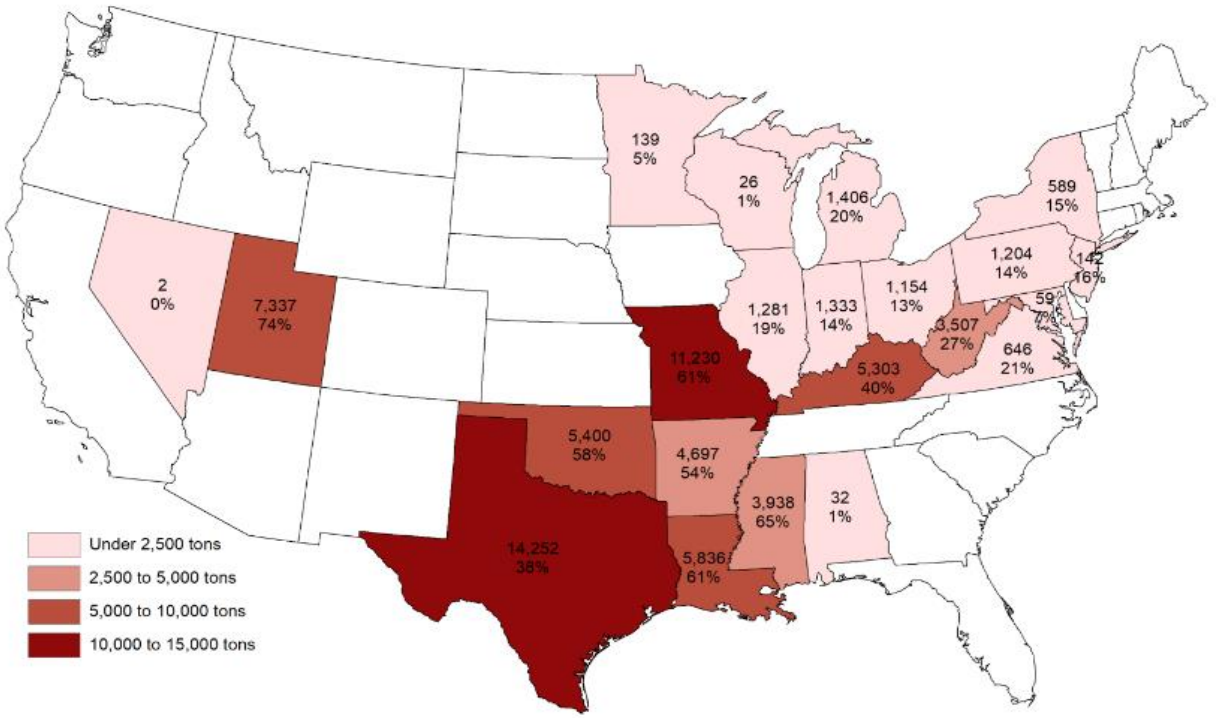
The rule is already impacting NOx emissions from the EGU sector

- 2023 marked the first year for the ozone season NOx emission reduction requirements for power plants in the Good Neighbor Plan region. The program was finalized for 22 states in March of 2023, went into effect on August 4, 2023, and is currently being implemented in 10 states.

- Ozone season NO_X emissions from EGUs in states currently implementing the Good Neighbor Plan in 2023 decreased by 18%.

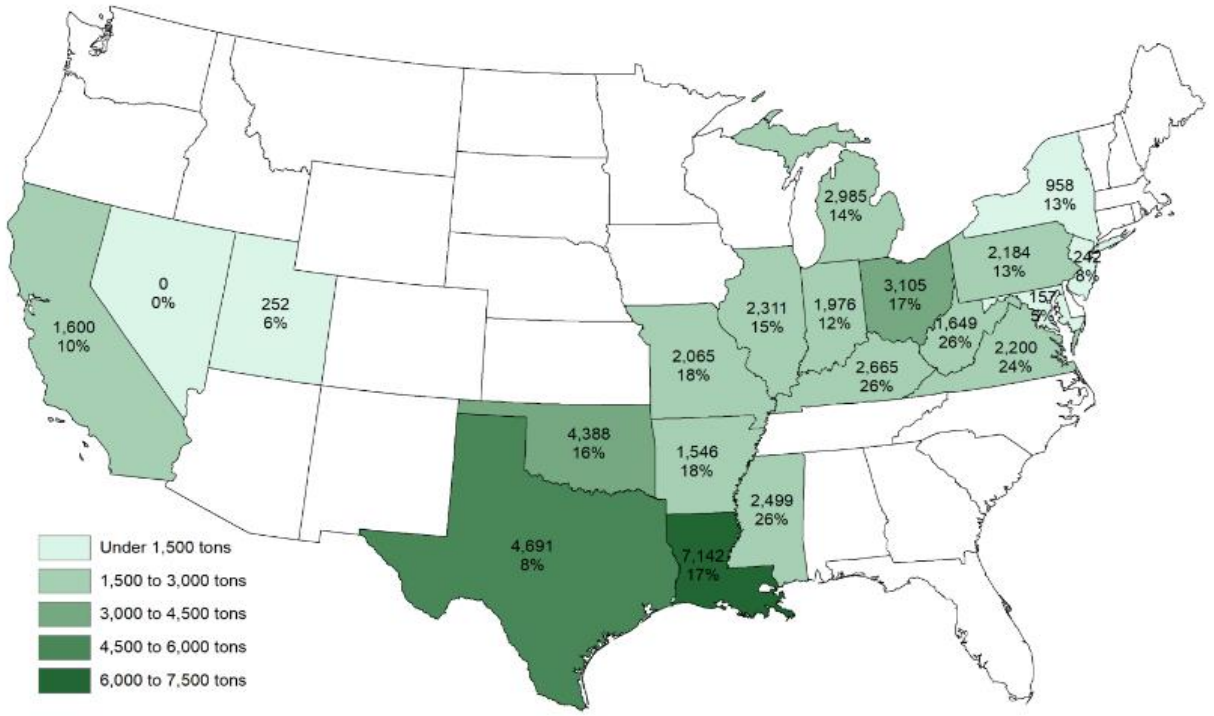
- The Good Neighbor rule does not include all measures necessary to reach attainment, but simply prohibits “significant contribution” from

Power Plant Ozone Season Emissions Reductions in 2027 Relative to 2021 Under the Final Good Neighbor Plan



The estimated emissions reductions reflect the difference between the rule's preset 2027 budgets for EGUs (this may vary based on

Industrial Source Ozone Season Emissions Reductions in 2026 Relative to 2019 Under the Final Good Neighbor Plan



The estimated percent reductions are calculated using total 2019 non-EGU emissions, including non-EGU point source emissions,

States and EPA need to work together to address problem

- Section 182(j) of Clean Air Act requires states in multi-state nonattainment areas to work collaboratively in the development of plans to reach attainment
- States recently met to coordinate ozone attainment plans, emission controls, and modeling and to develop a unified strategy. More reductions will be necessary to reach attainment.
- Additional NOx reductions will accrue after 2026 from:
  - Further reductions from 2015 GN FIPS;
  - National rule affecting HDVs (begins in 2027)
  - Possible national rule on medium and light duty diesel vehicles
  - Reductions at Ports from funding provided by the IRA
  - Reductions from state clean energy and energy efficiency programs
    - Modeling shows reductions that increase with time, particularly in 2030 and beyond

7. Possible additional emission reductions CT may evaluate

- NOx emissions from on-road motor vehicles comprise the largest single source category of NOx emissions in CT. Reductions in this source category could have a significant impact on working towards achieving the ozone standard

- Further restrictions on NOx emissions from nonroad engines to the extent allowed under federal law would also reduce NOx emissions.

- Municipal waste combustor comprise the largest industrial source category of NOx emissions in CT. NOx emissions reductions from municipal waste combustors could also impact compliance with ozone standard.

- Additional emission reductions could be obtained through other measures, such as lowering the states major source permitting threshold.

Conclusion

- Connecticut has made significant progress to address ozone pollution in the state, but more reductions are needed.
- Several federal regulations have recently been promulgated or proposed that may help reduce regional air pollution in the State.
- Ongoing research will continue to provide scientific data to support state and federal pollution reduction efforts.
- Coordinated ozone attainment planning is necessary and a complex process. EPA continues to work with Connecticut, as well as New York and New Jersey, to reduce elevated ozone pollution.

CLEAN AIR ACT SECTION 185: ENFORCEMENT FOR SEVERE AND EXTREME OZONE NONATTAINMENT AREAS FOR FAILURE TO ATTAIN

Important Requirements:

- **For the 2008 standard, CT's SIP for 185 fees is due by November of 2025.**
- **Major sources of VOC and NOx shall pay an annual penalty fee upon failure to attain by the attainment date.**
- **Procedures, including state authority, for assessing and collecting the fee must be specified in the SIP.**
- **The statutory per ton fee is $5000 (1990$) and must be adjusted for inflation each year**
  - **Current 185 fee is $11,922 per ton (2023).**
- **The fee shall be assessed on each ton emitted above 80% of a baseline (the lower of actual or permitted (allowable) emissions).**
- **EPA will collect the fees if the state does not.**
- **The CAA does not specify how the state must use the fees, only that they be collected.**

NEXT STEPS

DEEP intends to create a SIPRAC working group to evaluate the inventory and identify potential next steps for emission reductions strategies.

DEEP and EPA will continue regional engagement to identify a path forward to address ozone non-attainment for the entire NY-NJ-CT metro area.

Please reach out to Walter Barozi at walter.barozi@ct.gov

Questions