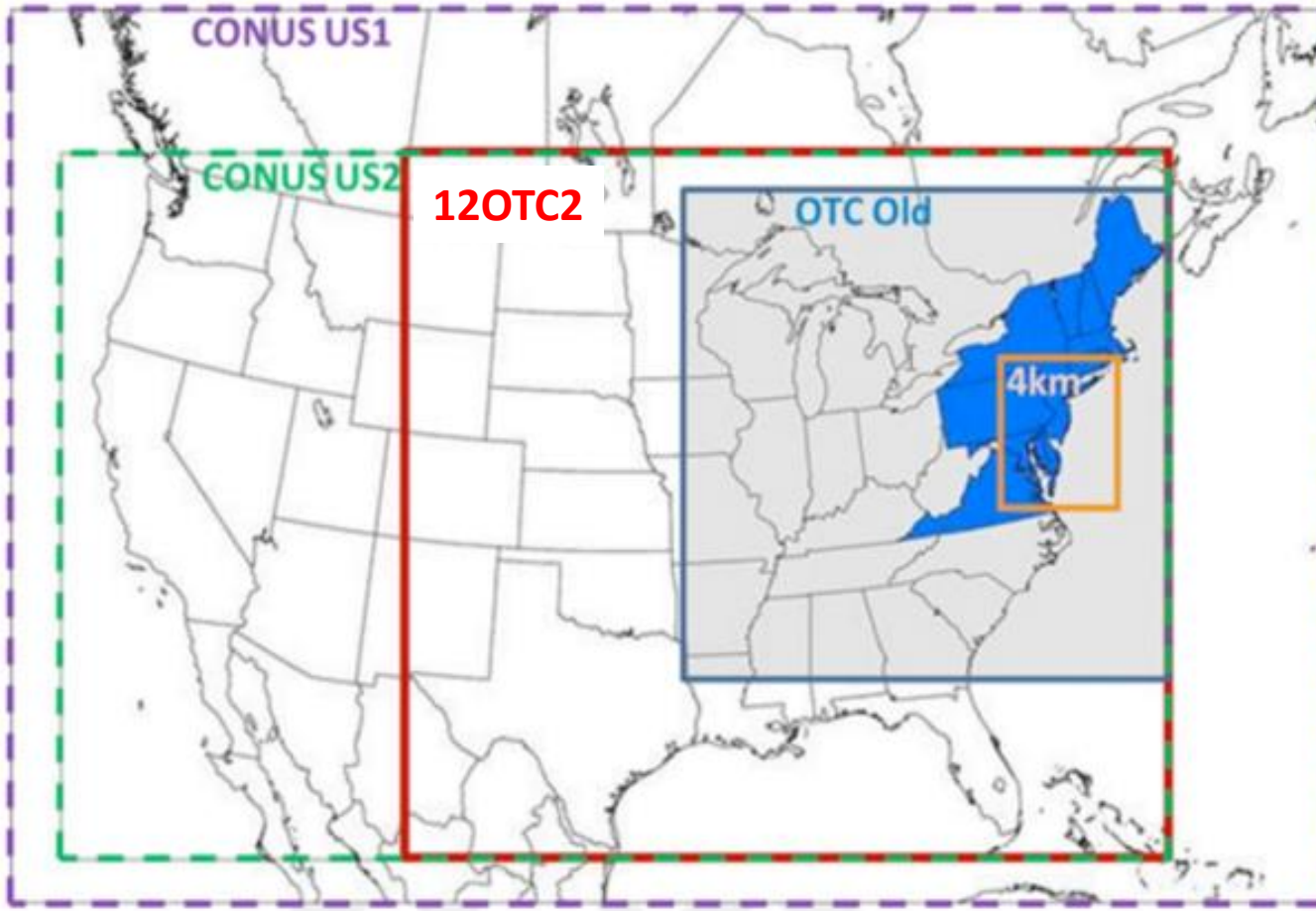


# Modeling Committee Update

OTC Stakeholder Meeting

April 13, 2021

# 2020 Action Plan Major Accomplishments



- Enlarged 12OTC2 modeling domain (red) tested and operational
- CMAQ/BEIS/ERTAC main platform
  - CAMx/BEIS/ERTAC option
  - Various photochemical, EGU emissions, and biogenic emissions models and versions of those models tested
- Model performs well against observations
  - Near water techniques being tested to further improve performance at critical locations
- Tracked seasonal ozone levels and preliminary attainment status
- Tracked regional field monitoring campaigns including **LISTOS** (Long Island Sound Tropospheric Ozone Study) and **OWLETS2** (Ozone Water-Land Environmental Transition Study)

# 2020-21 Modeling Committee Action Plan



- Major Projects:

- Assessment of near-water monitor options for model post-processing (1x1 grid cell, 3x3 grid cell, etc.)
- Complete and evaluate tagged emission modeling
- Complete and evaluate episodic screening modeling for peak electric demand days

- Ongoing work:

- Continue evaluating and integrating emission inventory updates into modeling
- Continued tracking seasonal ozone levels and preliminary attainment status
- Continued tracking of LISTOS and OWLETS2 field campaigns
- Tracking the research and science to better understand how the COVID-19 pandemic has affected air quality in the OTR

# 2008 and 2015 Ozone NAAQS Attainment Dates

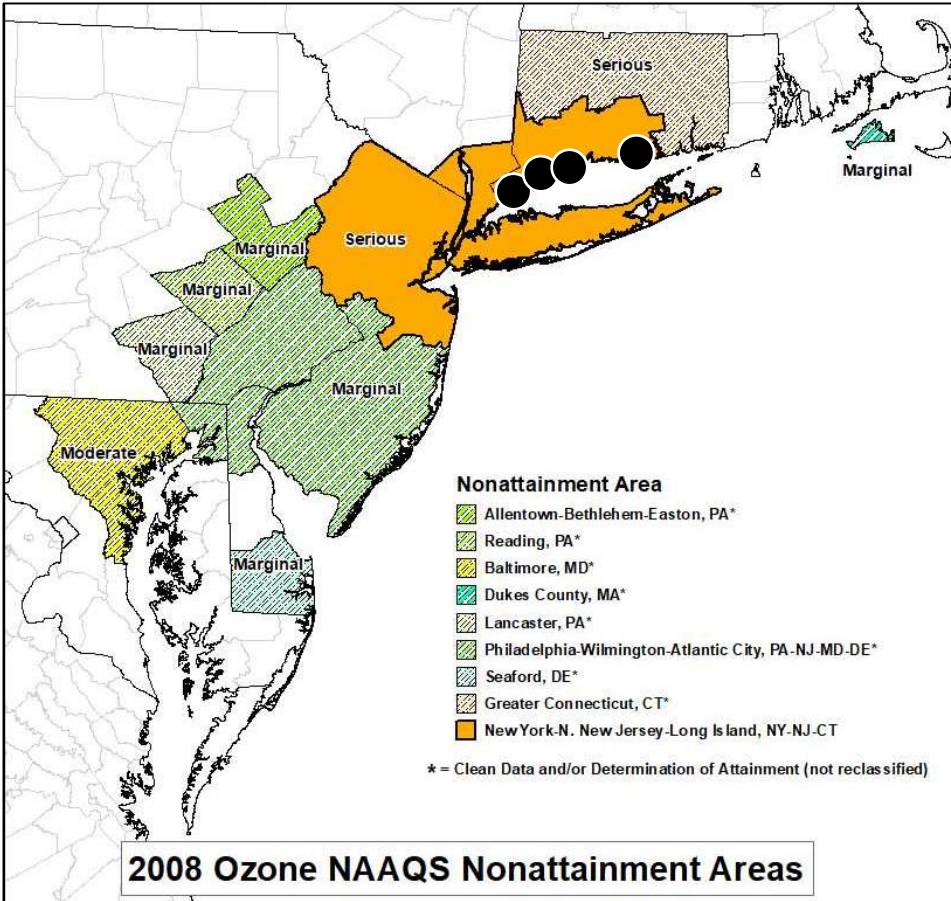


Ozone Timeline	2008 NAAQS	2015 NAAQS
Marginal Nonattainment Area Attainment Date	July 2015	August 2021 (2018-20 data)
Moderate Nonattainment Area Attainment Date	July 2018	August 2024 (2021-23 data)
Serious Nonattainment Area Attainment Date	July 1, 2021 (2018-20 data)	August 1, 2027 (2024-26 data)
Severe Nonattainment Area Attainment Date	July 2027 (2024-26 data)	August 2033
Extreme Nonattainment Area Attainment Date	July 2032	August 2038

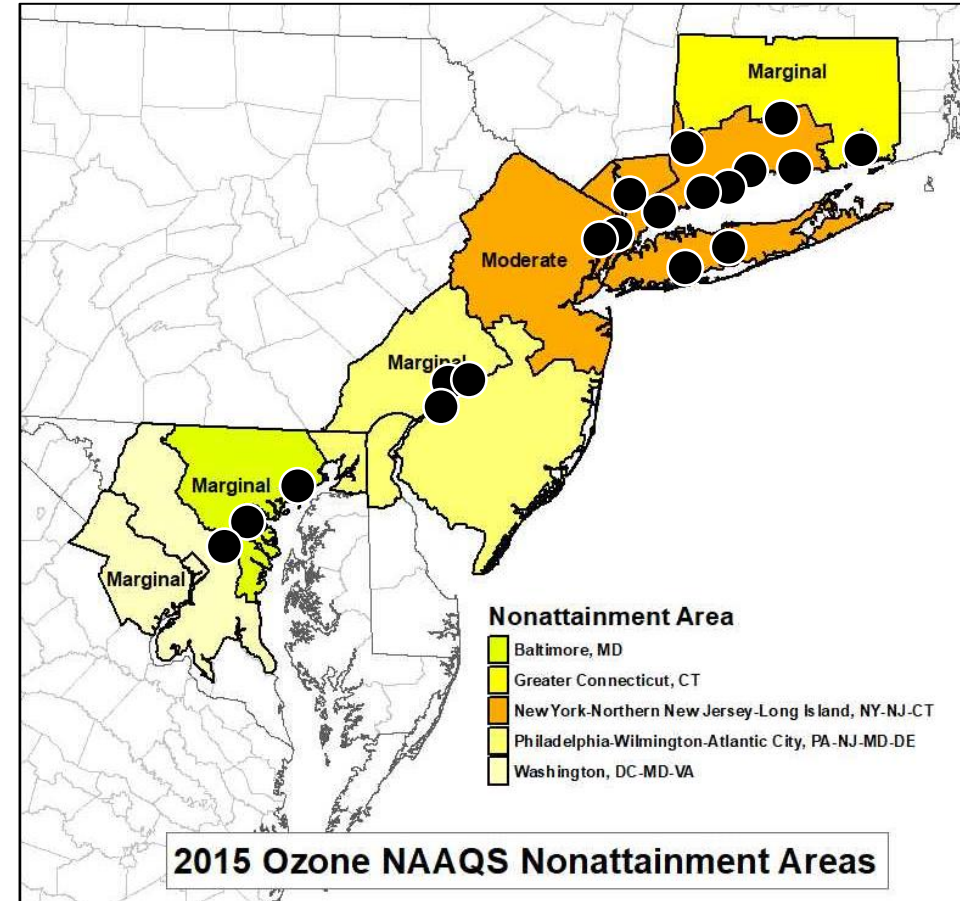


# 2020 Preliminary Violations

## 2008 NAAQS



## 2015 NAAQS



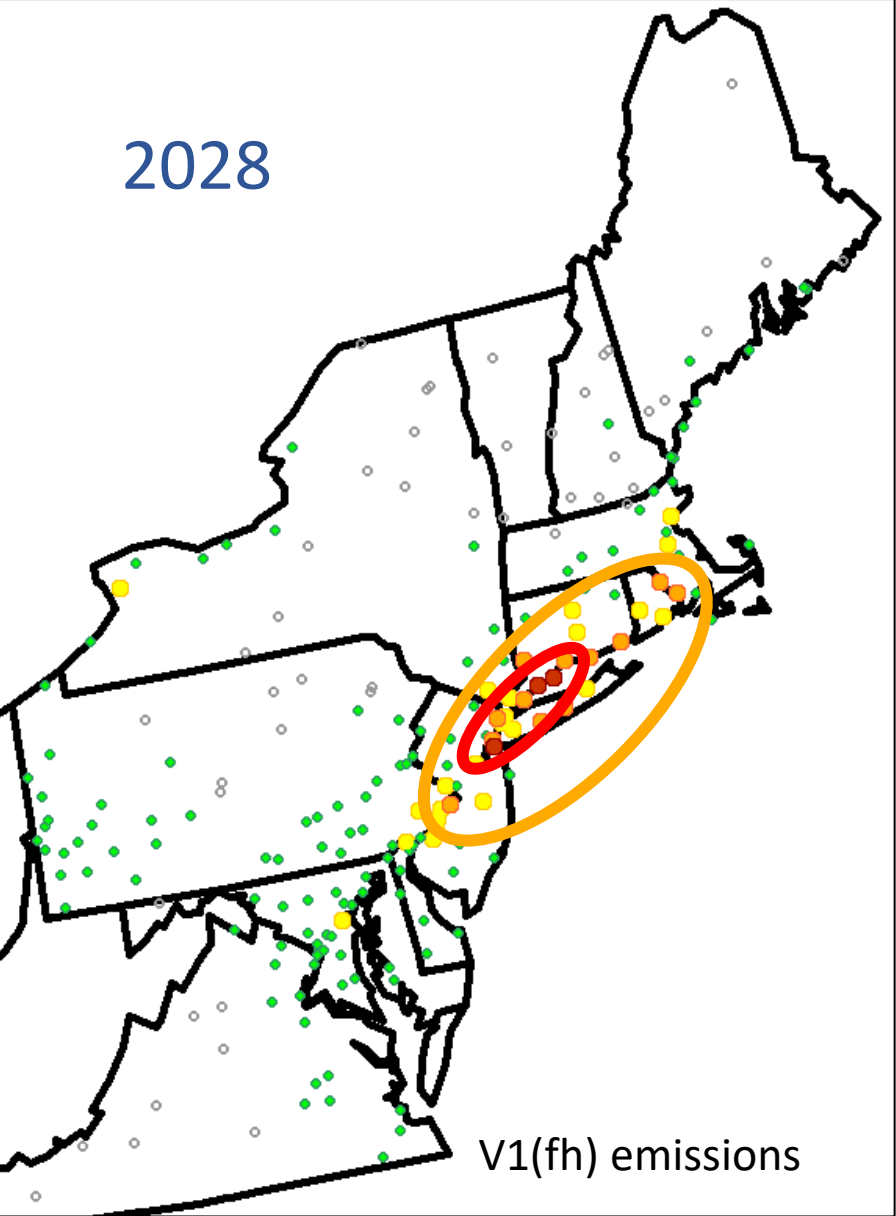
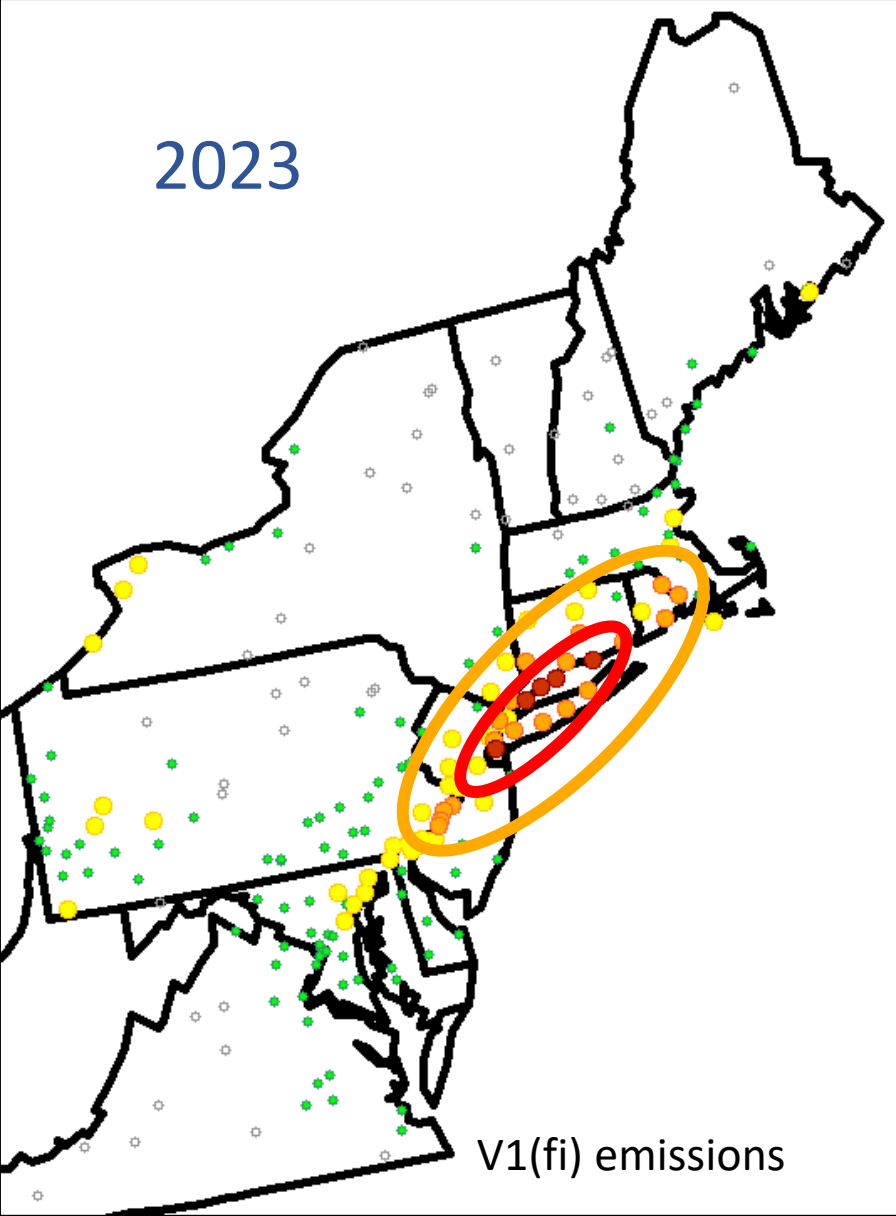
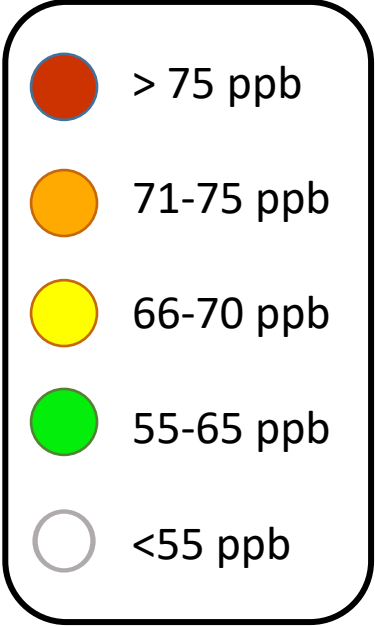
- Preliminary:
- NYC and Greater CT nonattainment areas are not eligible for 1-year extension
  - NYC nonattainment facing bump-up

- DC and Baltimore nonattainment areas are eligible for 1-year extension,
- NYC, Philadelphia, and Greater CT are not eligible.

# Testing Runs for 2023 and 2028 Projections

2023

2028



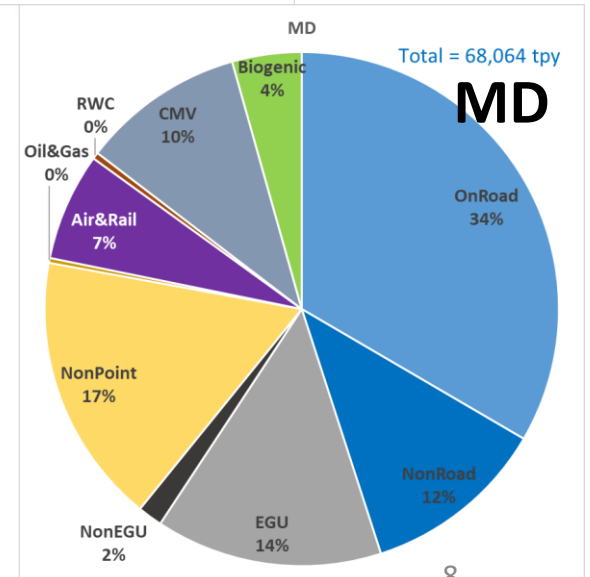
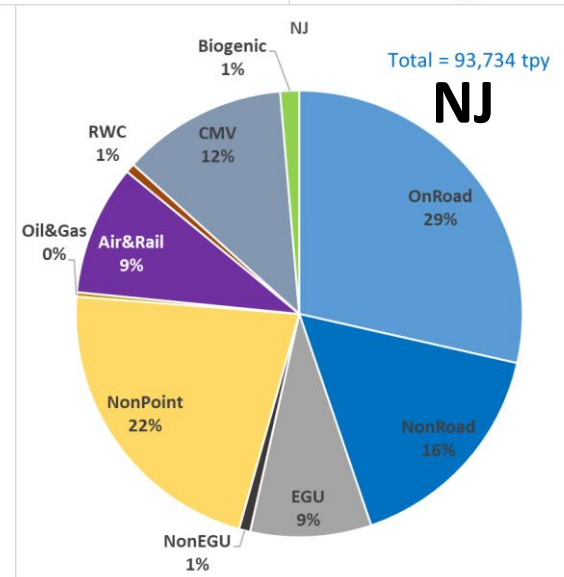
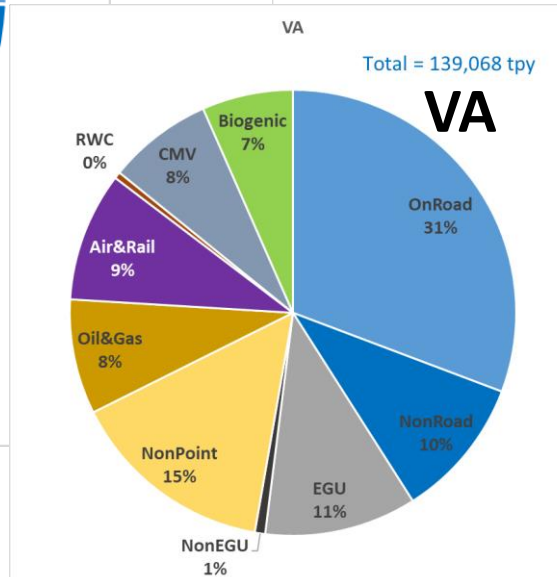
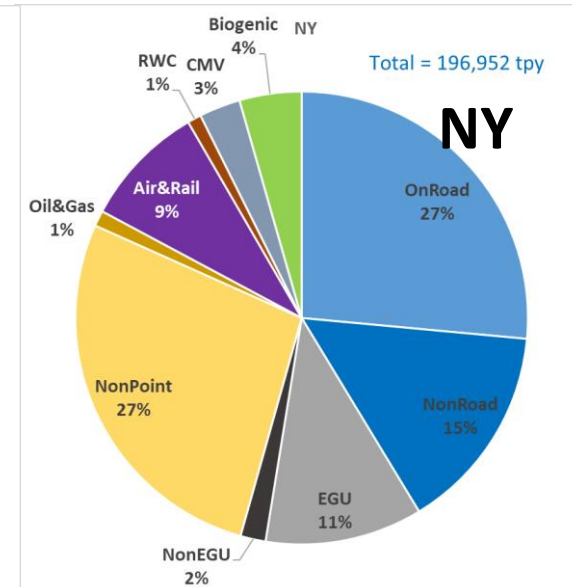
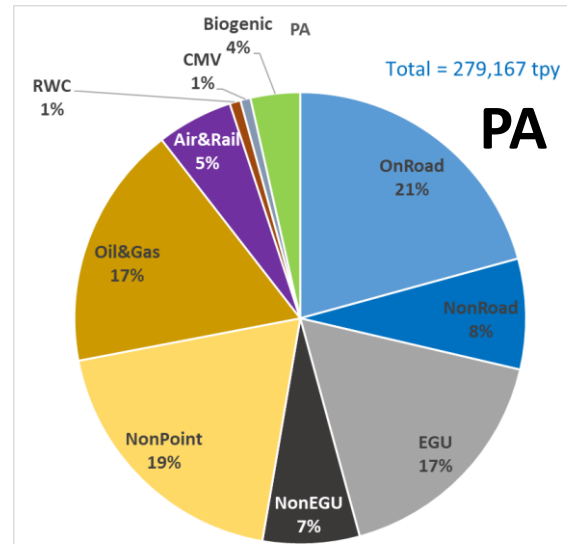
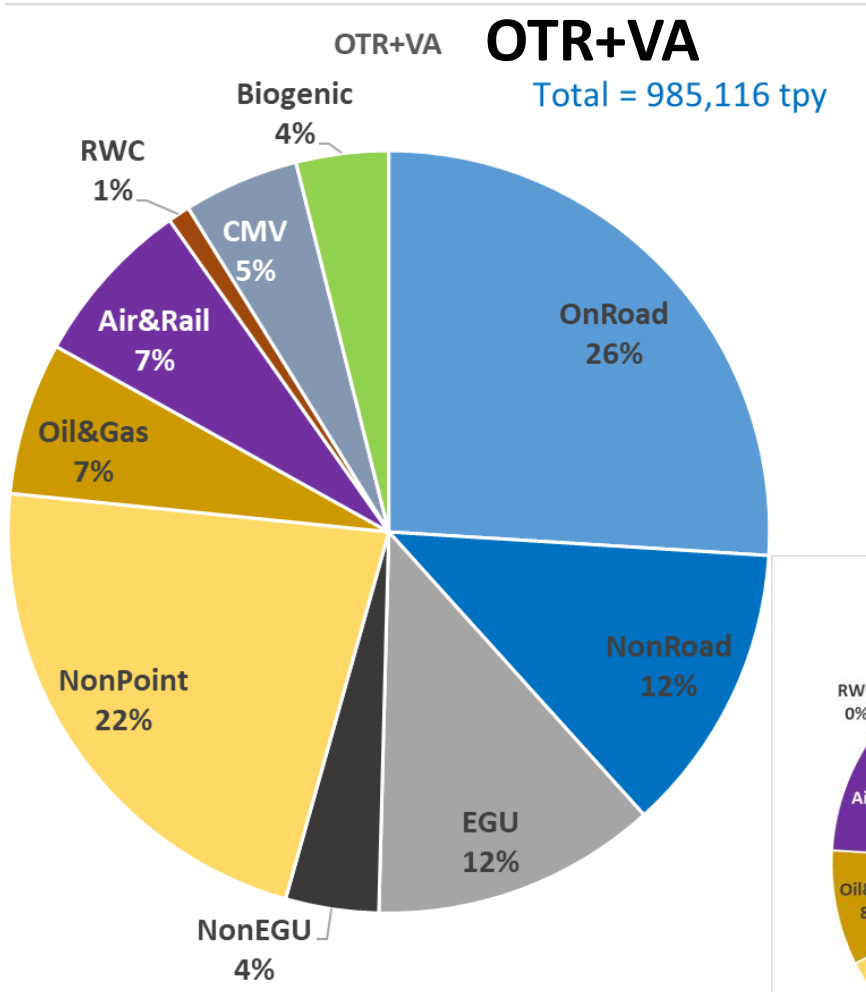
*Preliminary modeling  
Do not cite or quote  
3x3 grid cell analysis*

# Emission Inventories



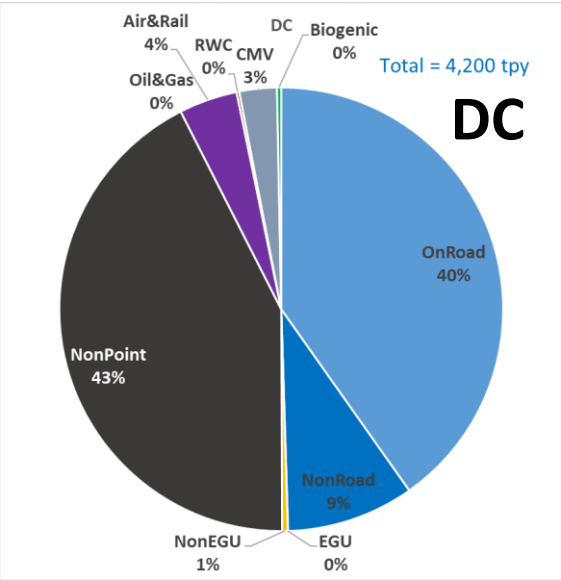
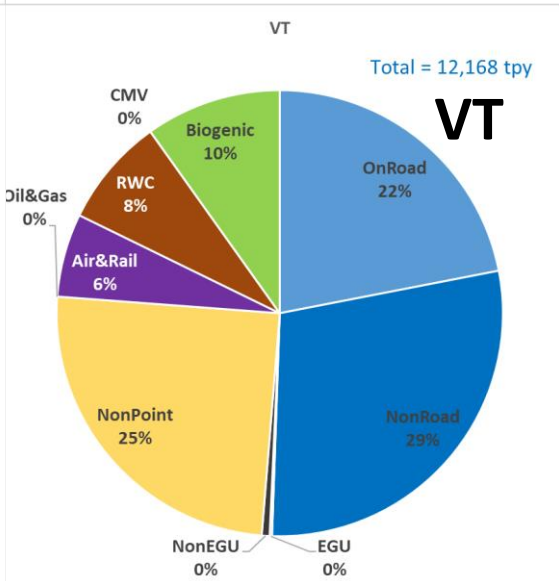
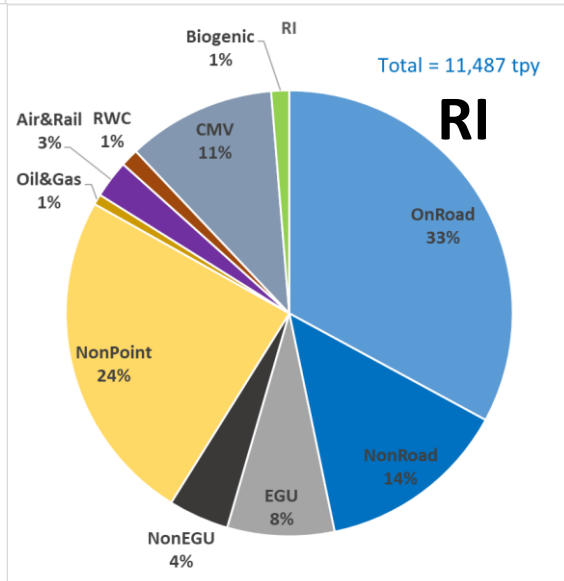
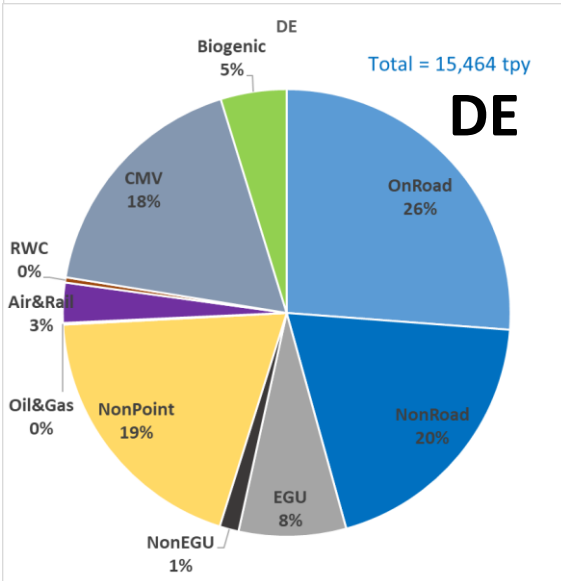
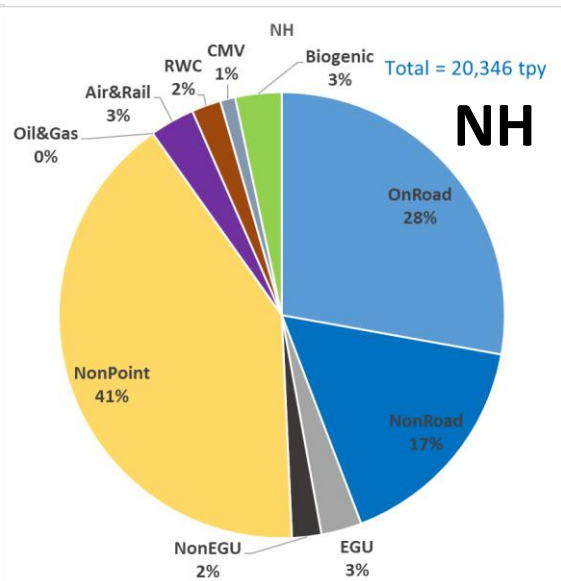
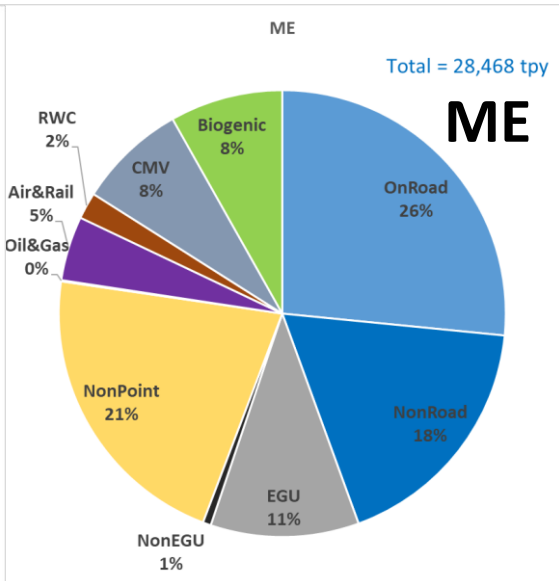
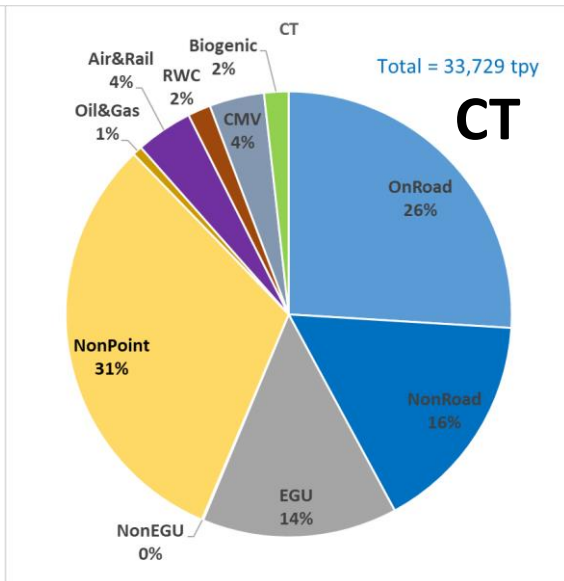
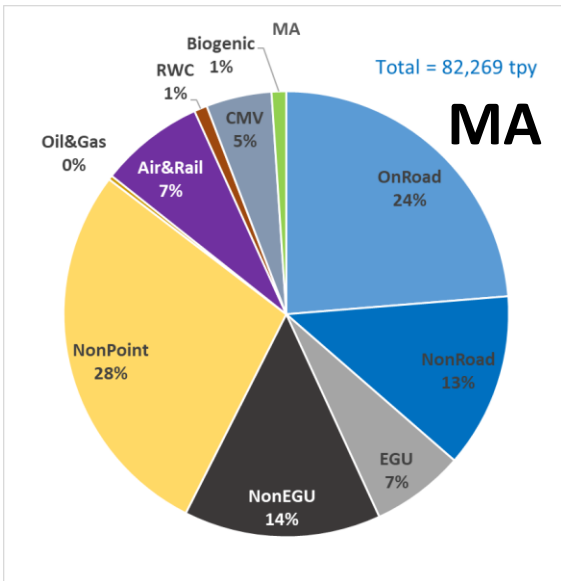
- Developed through a multi-state/EPA collaborative
  - 2016 Base Year based upon 2014 NEI and actual 2016 data, as well as some data from the 2017 NEI.
  - Future year projections to 2023 and 2028 currently available
  - Latest edition is the 'fi' emission inventory
  - The OTC Modeling Committee will work with the MARAMA/OTC combination inventory with the collaborative 'fi' emissions with ERTAC for EGUs and BEIS for biogenic emissions
  - The Modeling Committee always evaluates and adopts emission inventory upgrades and updates modeling as appropriate

# NOx Projected 2023 Emissions by Sector

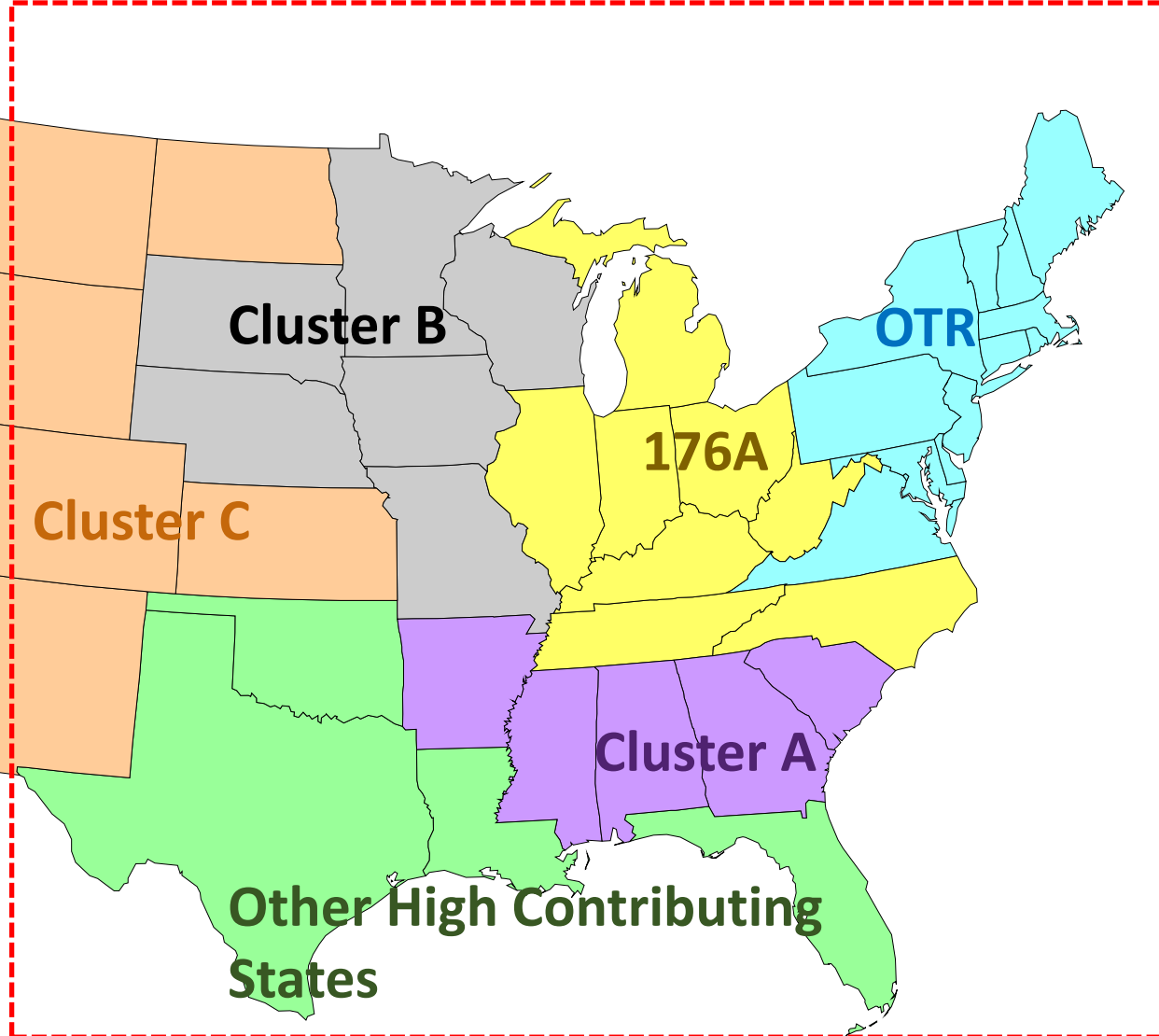




# NOx Projected 2023 Emissions by Sector



# 2023 Emission Tagging (fi)



Emission Sector	OTR + VA	176A	Other Large Contributing States	Clustered States (A, B, C)	Canada	Mexico
Area-nonpoint	By State	By State	By State	Cluster Group	Sector Group	Sector Group
Commercial Marine Vehicles	By State	By State	By State	Cluster Group		
EGU-ERTAC	By State	By State	By State	Cluster Group		
<u>NonEGU</u>	By State	By State	By State	Cluster Group		
NonRoad-diesel	By State	By State	By State	Cluster Group		
NonRoad-nondiesel	By State	By State	By State	Cluster Group		
OnRoad-diesel	By State	By State	By State	Cluster Group		
OnRoad-nondiesel	By State	By State	By State	Cluster Group		
Oil & Gas-point	By State	By State	By State	Cluster Group		
Oil & Gas-nonpoint	By State			Cluster Group		
EGU-Peaking Unit	By State	State Group	State Group	Cluster Group		
Rail	By State	State Group	State Group	Cluster Group		
Airport/Airplane to 3000'	By State	State Group	State Group	Cluster Group		
Agriculture	All Location Group					
Offshore CMV	All Location Group					
Offshore rigs	All Location Group					
Prescribed fire	All Location Group					
Other Anthropogenic	All Location Group					
Biogenic	All Location Group					
Boundary conditions	All Location Group					
Initial conditions	All Location Group					

# Peak Electricity Demand Day Screening Modeling

(In collaboration with SAS)

## “Bounding” Sensitivity Simulations



All other 2023  
emission sectors

2016 Meteorology

Base: 2016 Hourly  
Part 75 Emissions

ReBase: 2018/19 Hourly  
Part 75 Emissions

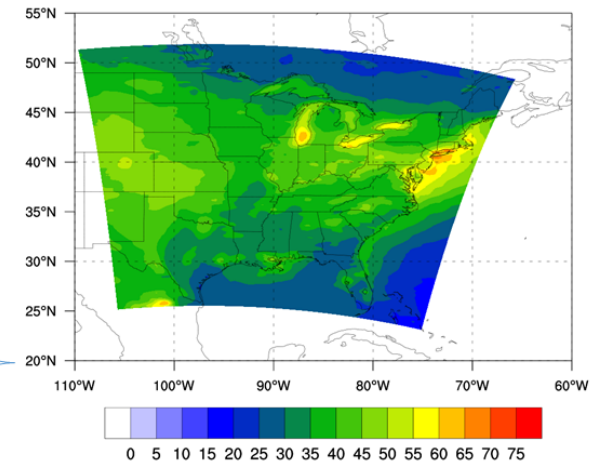
“Zeroed Out”  
Part 75 Peakers

“Zeroed Out”  
Part 75 Peakers &  
Non-Part 75 Peakers

“Zeroed Out” Part 75 Peakers & Non-  
Part 75 Peakers & Part 75 non-EGUS

Part 75 Units Replaced  
with Dirtiest Facilities

Part 75 Units Replaced  
with Cleanest Facilities

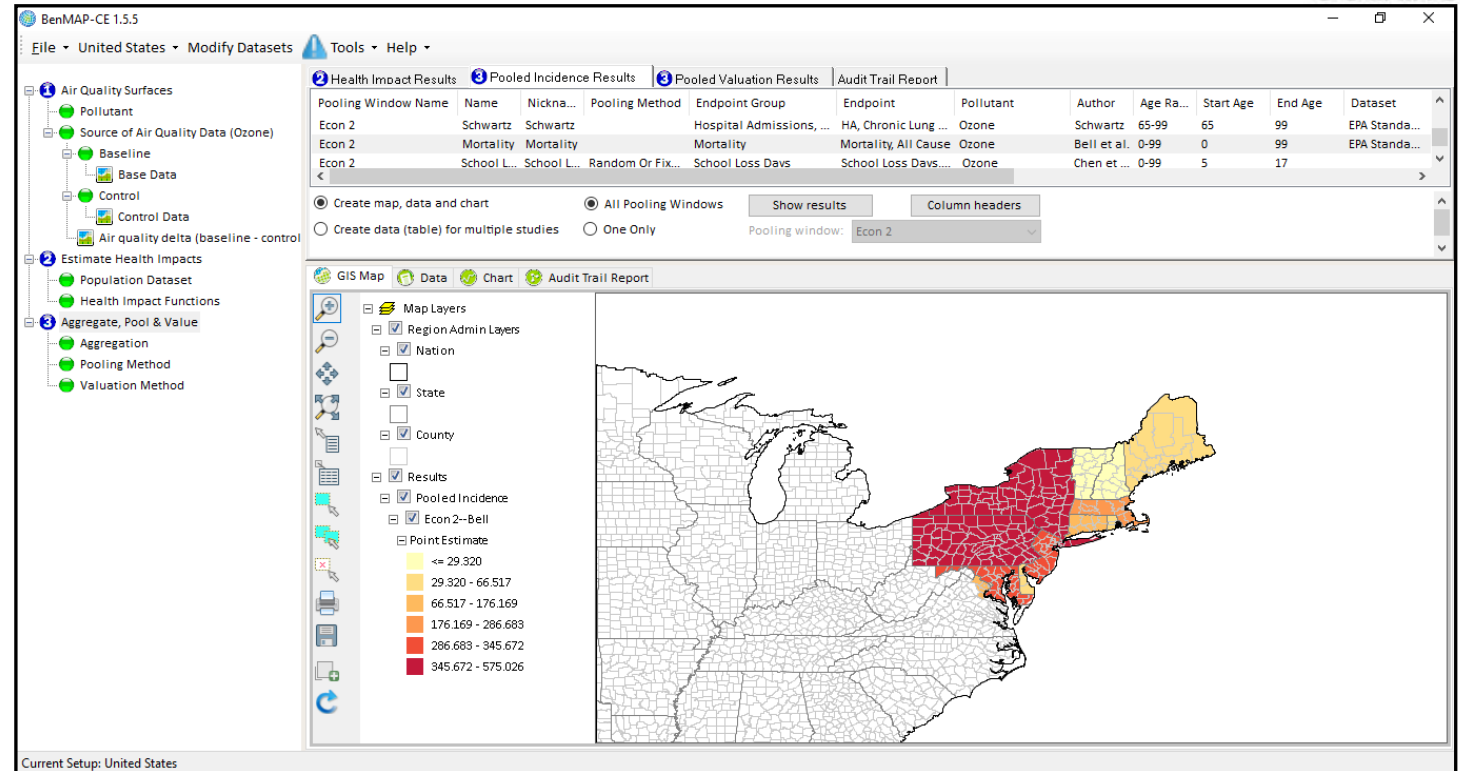


Differences between  
sensitivity runs and base cases  
gives peaker contribution

# What Is BenMap - Health and Economic Benefit

## Calculation Needs

- Population (by age)  
*(US census)*
- Change in Air Quality  
*(monitored or modeled data)*
- Health Incidence  
*(epidemiological literature – Ozone and PM in BenMap)*
- Economic Impact  
*(economic literature – Ozone and PM in BenMap)*



## OTC Analyses

1. Roll-back Studies
2. Application to a modeling run

1. Rolls Monitored Ozone Levels to Several Standards (70, 65, 40)
  - Shows: impacts of continued nonattainment and potential benefits from lower ozone thresholds
  - Annually Updated
  - Available on <http://otcair.org>
2. Application to modeling is not currently planned

# Committee Potential Collaboration for Additional Modeling



## SAS Committee

- optimization of power plant controls
- corridor VOC emission controls
- other

## Mobile Sources Committee

- heavy duty diesel (HDD) NO<sub>x</sub> controls
- aftermarket catalyst replacement regulation
- other

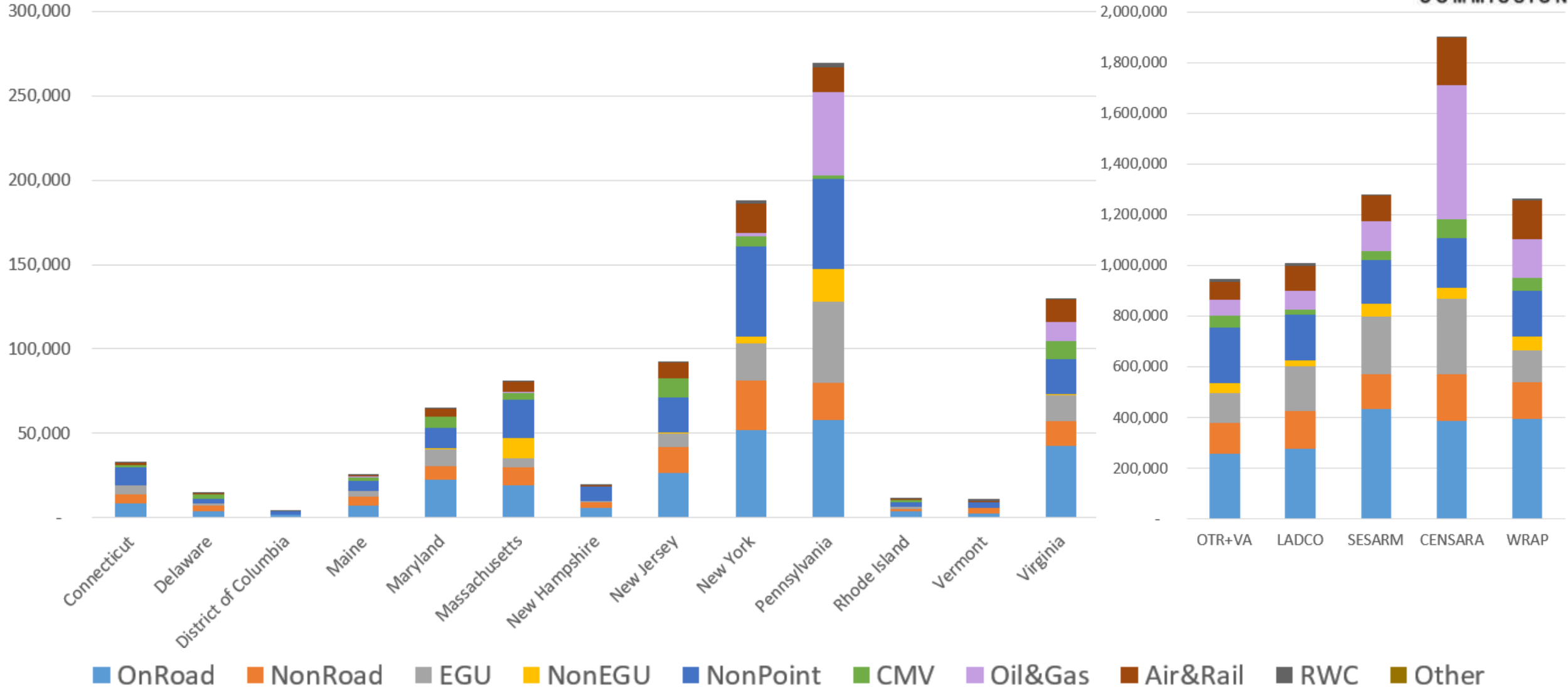
# Contact Information



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# Bonus Slides

# Projected 2023 (fi) NOx Emissions Inventories





# 20 Largest NOx Emitting States Projected 2023 (fi) Emissions Inventories

