



LADCO | LAKE MICHIGAN
AIR DIRECTORS CONSORTIUM

LADCO 2024 Business Meeting

Technical Oversight Committee

September 26, 2024

Agenda for Today

- 8:30 Welcome and review agenda
- 8:45 PM2.5 NAAQS attainment planning, compliance, precursor analyses
- 11:00 Regional haze planning
- Noon Air pollution and emissions trends
- 1:00 Ozone NAAQS attainment planning
- 2:00 Exceptional events
- 3:00 Chicago summer 2023 field campaign update
- 4:00 Mobile and stationary source emissions: Impacts of federal program
- 5:00 States-only session



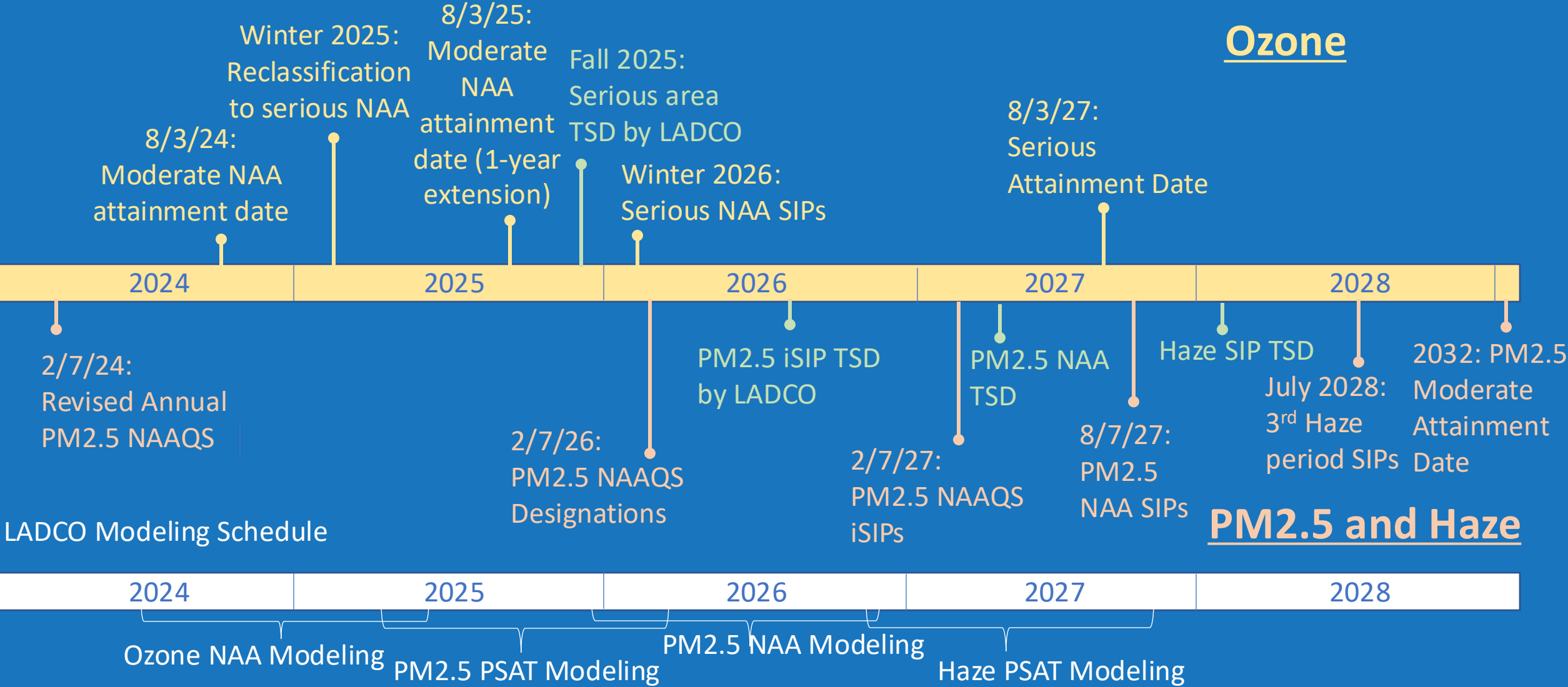
Session Objectives

- Plan LADCO technical work during 2025
- Identify key dates and interaction periods for regional air quality planning in the next year
- Get updates on insights from the Chicago summer 2023 field campaign
- Define LADCO's role in upcoming ozone, PM_{2.5}, and regional haze planning

Session Format

LADCO presents background technical information to initiate state conversations on each topic

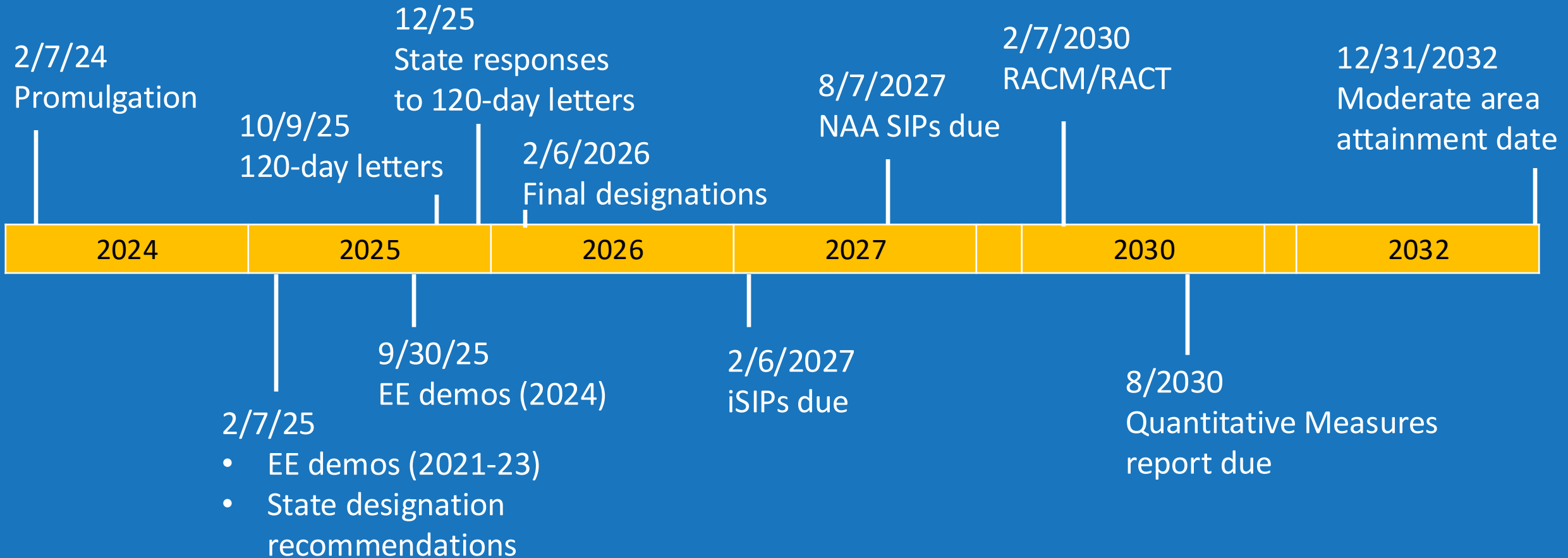
Ozone, PM2.5, and Haze Planning Timelines: 2024-2028



A wide-angle photograph of the Chicago skyline at dusk, viewed from across Lake Michigan. The sky is filled with dramatic, dark clouds, with some light breaking through. The city lights are beginning to glow, and the water in the foreground is a deep blue. The Willis Tower is the most prominent building on the right side of the skyline.

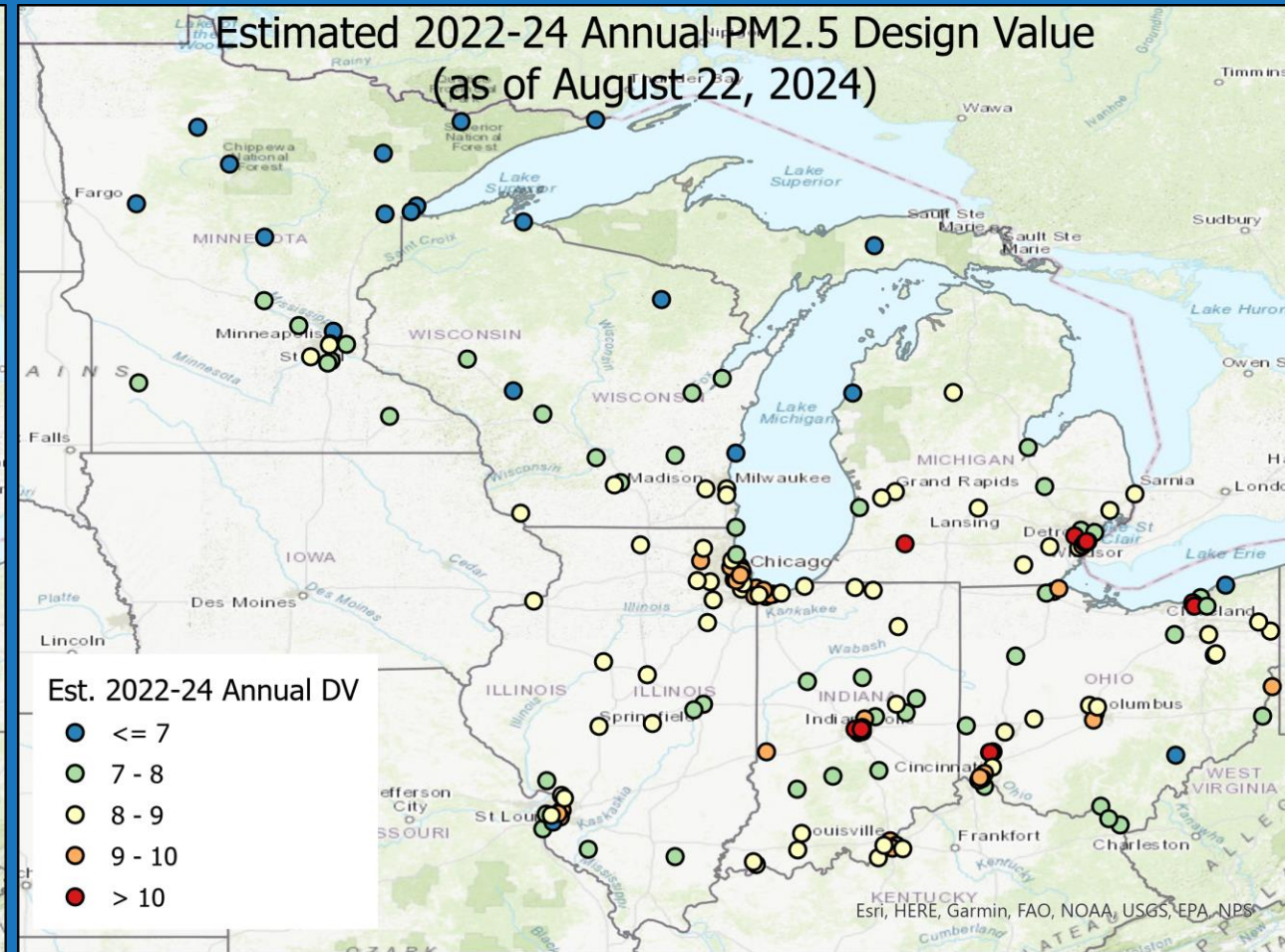
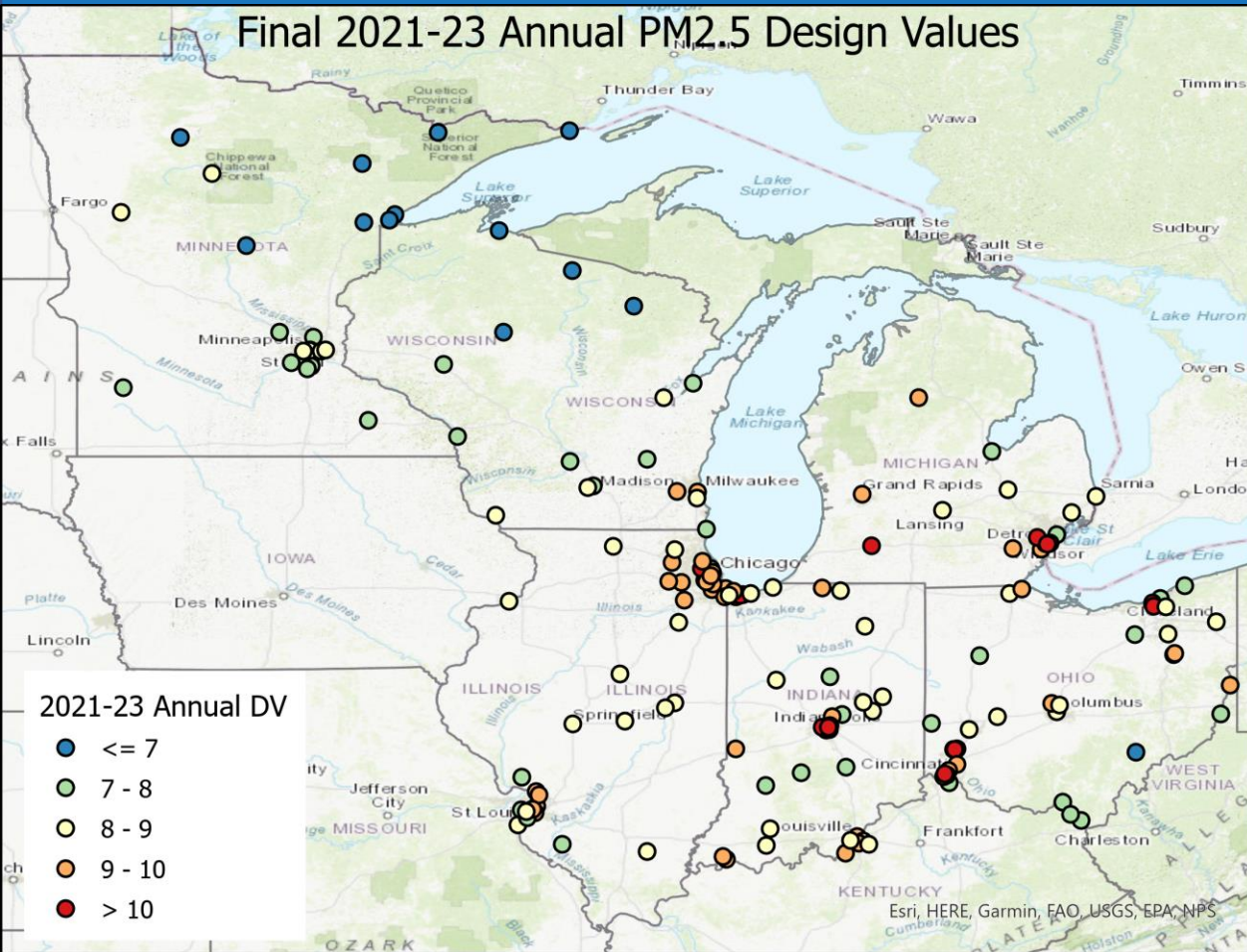
PM_{2.5} NAAQS Compliance, Attainment, & Precursor Analysis

Annual PM_{2.5} NAAQS Planning Timeline



Annual PM_{2.5} Design Values

- Comparison of 2021-23 and 2022-24 (estimated) DVs
- With EE demos, likely NAAs will be the big urban areas (plus or two medium areas)



PM_{2.5} Attainment Support @ LADCO

- Now – Spring 2025
 - 2022 Air Quality Modeling
 - EE demo support
 - PM_{2.5} chemistry research
- Spring 2025
 - 2032 CAMx modeling and PM attainment test
- Spring-Summer 2025
 - Precursor significance testing
- 2027
 - Q1/Q2: NAA SIP TSD
 - August: NAA SIP due

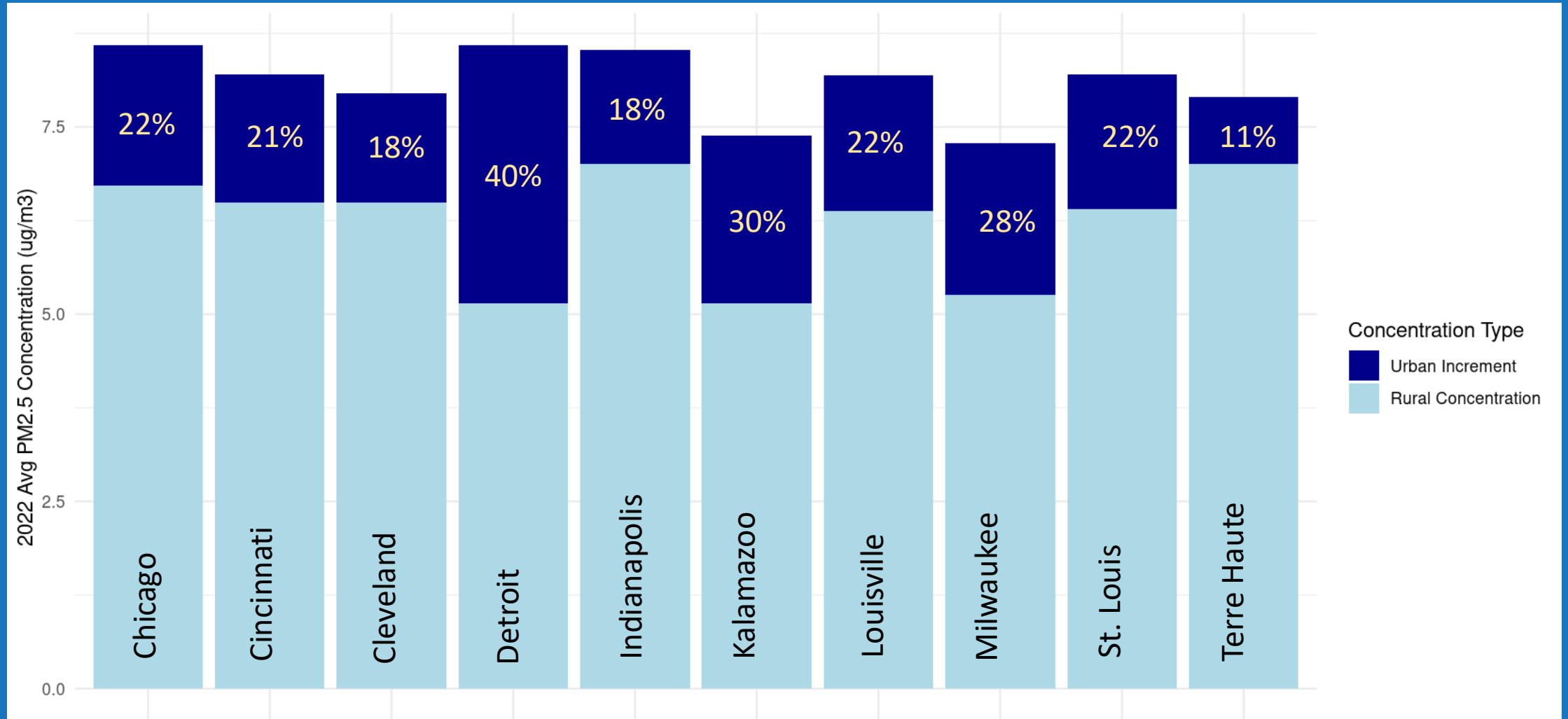


PM_{2.5} Precursor Significance

- Three types of significance tests
 - Attainment demonstration comprehensive
 - Attainment demonstration major source
 - NNSR demonstration
- Start with a comprehensive analysis based on ambient monitors
 - What is the contribution of each precursor to PM_{2.5} mass in each potential NAA?
 - How do we know if the measured PM_{2.5} is from precursors in/near the NAA or transported?



Urban Increment Estimates



PM_{2.5} Precursor Significance

Proposed Comprehensive Analysis Method

1. Scale speciated annual average PM_{2.5} by the urban increment
*Monitored PM_{2.5} * Urban Increment*
2. For total PM_{2.5} monitors use NAA average speciation
3. Compare urban speciated PM_{2.5} at each monitor to SIL (0.13 ug/m³) to test significance



PM_{2.5} Precursor Significance

- NNSR demonstrations can happen at any time; EPA recommends waiting for final designations
 - Consider preparing these in advance for the NAAs that are unavoidable
 - Need to first understand if the demo is needed or worth the effort
 - Are the precursors already part of a permitting program or will a new permitting program apply to sources in the NAA



PM_{2.5} NAAQS Planning

- PM_{2.5} NAAQS compliance discussion
- Training needs for agency staff
- Actions to be taken between now and the designations in 2025
- Will the iSIPs need a modeling-based Good Neighbor plan?



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Regional Haze Planning

Regional Haze Planning

- Wait for guidance from EPA before making new plans for haze
 - Expecting a 2-3 delay on the SIPs
- Punt?



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LADCO Workgroup Update

Active LADCO Workgroups

- Ozone Technical Workgroup (O3TWG)
- PM2.5 Technical Workgroup (PMTWG)
- Exceptional Event Workgroup
- Regional Haze Workgroup
- Emissions Workgroup
- Data Analysis Workgroup
- IRA/CPRG Discussion Group



Ozone Technical Workgroup

- Ozone episode and season analysis
- Reviewed NO_x and VOC emissions control options
- Updates on LADCO 2022 modeling
- MOOSE campaign results and insights
- Changed schedule from monthly to “as-needed” starting in February 2024



PM_{2.5} Technical Workgroup

- Workgroup kickoff in February 2024
- Reviewed/comments on LADCO decision support resources
 - Design value tracker
 - Wildfire smoke EE regulatory significance estimates
 - AQS data flagging tool
- PM_{2.5} monitoring data and chemistry analysis
- Emissions and met analysis
- PM_{2.5} episode analysis
- Precursor significance testing
- Planning timeline



Exceptional Event Workgroup

- Transitioned to meeting through the winter as $PM_{2.5}$ became a focus
- Seasonal and monthly data reviews
 - Deep dive into 2023 fire smoke events
 - SMOKE, ozone, and $PM_{2.5}$ data exploration
- Piloted decision support products
 - $PM_{2.5}$ screening and regulatory significance
 - $PM_{2.5}$ tiering analysis
 - $PM_{2.5}$ data flagging
- Discussed and coordinated regional $PM_{2.5}$ demonstration



Regional Haze Workgroup

- Met every other month in 2024
- Mostly EPA and FLM updates
- State roundtables on haze planning



Emissions Workgroup

- Coordinated review of national inventory and emissions modeling platform data
 - MOVES and mobile activity data in December 2023
 - National 2022v1 platform reviews in April and October 2024
 - Stationary source controls and shutdowns
 - Oil and gas inventories (OH & IL)
 - Ancillary data reviews
- Participated in calls with U.S. EPA to identify and discuss issues with the 2022 data for the LADCO region



Data Analysis Workgroup

- Bi-monthly meetings
- Round robin check-ins on data analysis work
- Presentations on:
 - AGES+ Chicago field campaign (LADCO)
 - Analysis of wildfire smoke events (IN & LADCO)
 - PM2.5 speciation analysis (LADCO)
 - MPCA use of AQ sensors (MN)
 - Use of AI large language models (e.g., ChatGPT) for data analysis (LADCO)
 - Overview of Python tutorials (UW-Madison)



CPRG Discussion Group

- Bi-monthly calls with state CPRG planners
- Discussions on
 - Grant applications
 - Stakeholder engagement/outreach
 - Technical analysis
 - Picking projects
- Recent pivot to industrial point inventory analysis



LADCO Workgroups

- Are any changes needed to the workgroup line-up?
- What should be the priorities for each of the workgroups in the coming year?



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Ozone NAAQS Attainment Planning

Ozone Control Modeling Summary

Source Apportionment

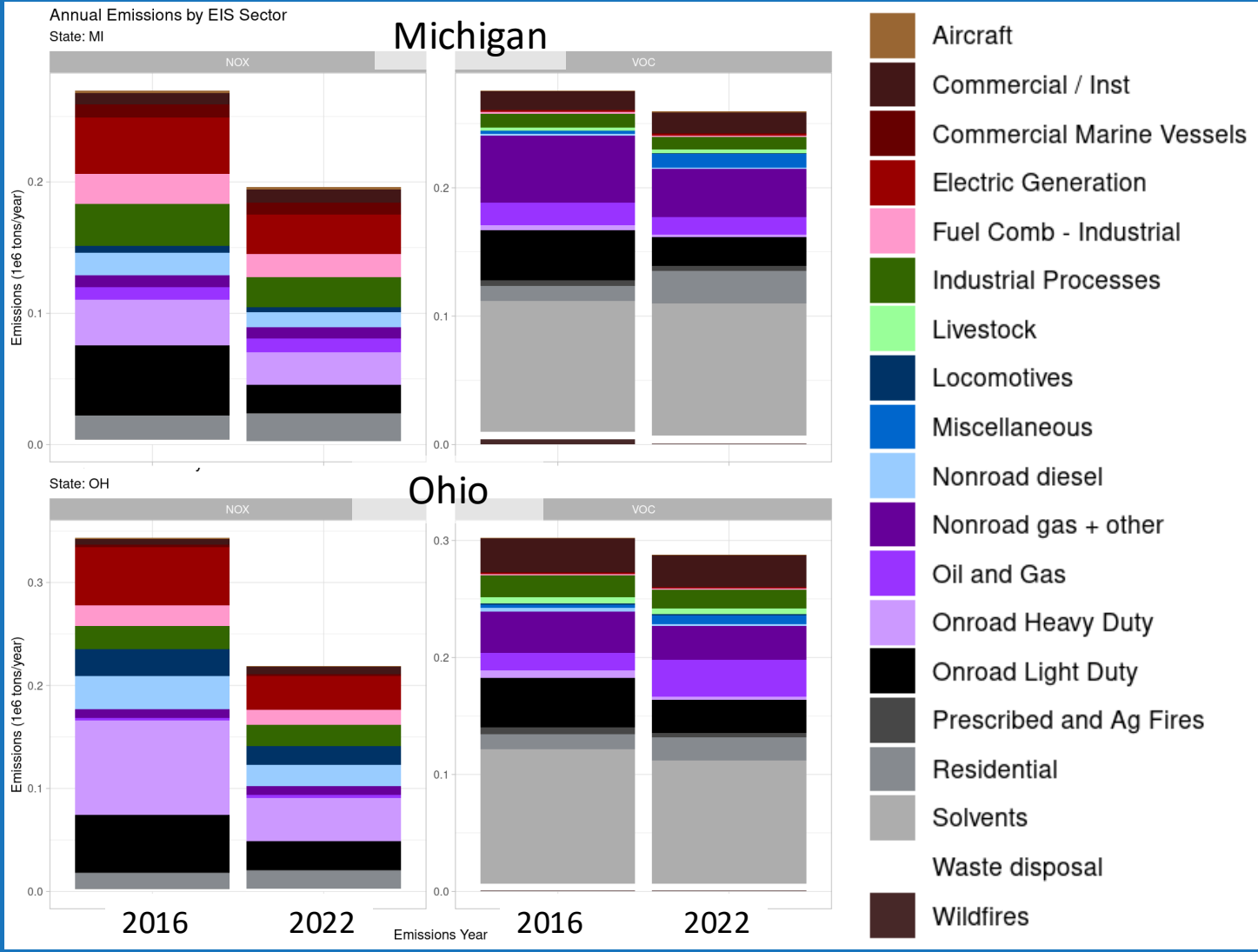
- On-road non-diesel = 12-15%
- On-road diesel = 8-14%
- Non-EGU point = 5-10%
- Nonroad diesel = 6-8%
- Nonroad non-diesel = 2-6%
- EGU point = 4-13%
- Solvents = 4-5%

HDDM

- NOx reductions will be impactful in every NAA
- VOC reductions are needed everywhere but Western MI
- Mobile sources (on- and off-road) are impactful in every NAA
- Volatile chemical products for VOCs

NOx

VOC

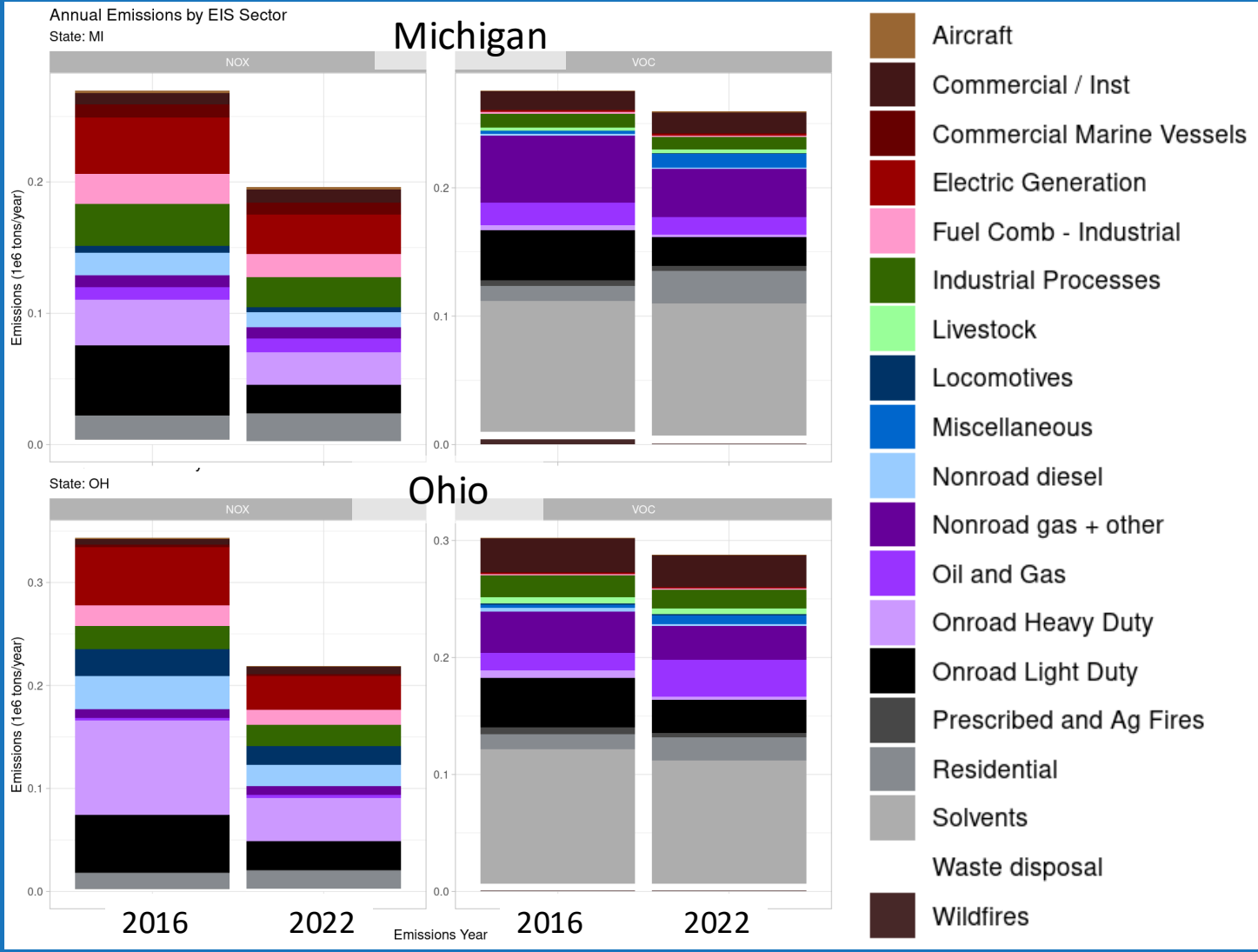


Ozone Precursor Emissions Changes

- 2016 -> 2022
- NOx reductions:
 - Onroad light duty
 - Onroad heavy duty
 - EGUs
 - Industrial point
 - Nonroad diesel
- VOC reductions:
 - Onroad light duty
 - Nonroad gas
 - Solvents

NOx

VOC



Ozone Precursor Emissions Changes

- 2016 -> 2022
- NOx increases:
 - Residential fuel use
 - Oil and gas in states with production
- VOC increases
 - Residential fuel use
 - Oil and gas

Ozone Attainment Support @ LADCO

- Now – Dec 2024
 - 2022 WRF TSD
 - Air quality modeling protocol
 - 2022 emission modeling
- Winter 2024
 - 2022 CAMx modeling
 - 2026 OTB controls emissions modeling
- Spring 2025
 - 2026 CAMx modeling and attainment test
- Fall 2025
 - Serious area NAA SIP TSD
- February 2026
 - Serious area NAA SIP due



Ozone NAAQS Attainment Planning

- NOx emissions are expected to decline from light duty vehicles, some off-road sources, and stationary sources with new RACT controls
- Gaps
 - Diesel M/HDDT fleet characterization
 - Diesel emissions control system performance characterization
- Serious NAA SIP requires a modeled demonstration of attainment
 - Collaborate on ideas across the region for identifying emissions strategies

NOx and VOC emissions reductions will benefit both ozone and PM_{2.5} attainment



Exceptional Events

4415 West Harrison St, Suite 548
Hillside, IL

Exceptional Event Planning

- Recent focus on PM_{2.5} demonstrations
- What can we anticipate for ozone?
 - LADCO will experiment with 2023 smoke impacts on the 2026 attainment testing next year: what are the impacts of the fires on RRFs
- With 2024 being a relatively low ozone year, despite the number of violations, what about clean data determinations?
- Are there any tools or data support that states need? What are your gaps/challenges with EE planning?



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Chicago Summer 2023 Field Campaign Update

AGES Campaign Summary

- See Angie Dicken's Slides



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Mobile and Stationary Source Emissions Impacts of Federal Control Programs

National Rules Impacts on NOx and VOC Emissions

- LD/MD Vehicle Emissions Standards Rule ([link](#))
- MD/HD Phase 3 GHG Rule ([link](#))
- GHG standards for fossil fueled EGUs ([link](#))
- Various NSPS and NESHAPS actions
- ~~Good Neighbor~~



Estimated Emissions Reductions from National Rules

Rule	NOx		VOC		Start Year	Notes
	Full	2030	Full	2030		
LD/MD Rule*	21% mobile 1% upstream 94,335 tons		32% mobile 1% upstream 194,188 tons		2027	Full impacts not expected until 2055; see table 6-1 of RIA TSD
MD/HD GHG Rule*	20% mobile 54,268 tons	0.2% mobile 1,096 tons	19.8% mobile 7,242 tons	0.7% mobile 452 tons	2027	Full impacts not expected until 2055; see Table 4-20 of RIA TSD
EGU GHG Rule*	22% EGU 24,000 tons	5% EGU 20,000 tons	N/A	N/A	2030	Rule analysis projects impacts to 2045; see Table 3-6 in RIA .
Good Neighbor	IL 3,592 tons IN 3,390 tons	MI 4,393 tons MN 139 tons	OH 4,259 tons WI 26 tons		6-7 year implementation	NOx reductions from EGU + non-EGU sources (ref)
NSPS & NESHAPS	Waiting for the 2022v1 analytic year data to estimate					

Proposed LADCO FY2025 Work Priorities

- Ozone
 - 2015 O₃ NAAQS attainment demonstration TSD
 - Trends analysis
- PM2.5 and Haze
 - PM trends and decision support tools
 - 2024 Annual PM2.5 NAAQS attainment testing
- Training
 - Identify priorities and broker training funds
 - Advocate for states in the national training program
 - Drive development of remote/e-learning
- Monitoring
 - 5-year network assessment support
 - Hg monitoring program support
- Other Issues
 - Environmental justice support
 - National inventory collaborative
 - Exceptional events support
- Outreach and Communication
 - Facilitate regional planning among member states
 - IRA coordination
 - Engage with region stakeholders
 - Host outreach webinars and events
 - LADCO website

States Only Session

Thanks to US EPA for participating in the meeting today!



Meeting Summary

1. Summary and take-aways
2. Action Items