

# Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standards

## INFORMATIONAL WEBINAR

---

MARCH 29, 2022

MARCH 30, 2022

MARCH 31, 2022

# Agenda

---

- Proposal Overview
- 4-Step Interstate Transport Framework
- Transport Linkages for 2015 Ozone NAAQS
- Proposed Rule Covered Geography
- Proposal Requirements:
  - Non-EGU Emissions Limitations
  - EGU CSAPR Ozone Season Trading Program Requirements
- Costs and Benefits
- Questions

# Proposal Overview

---

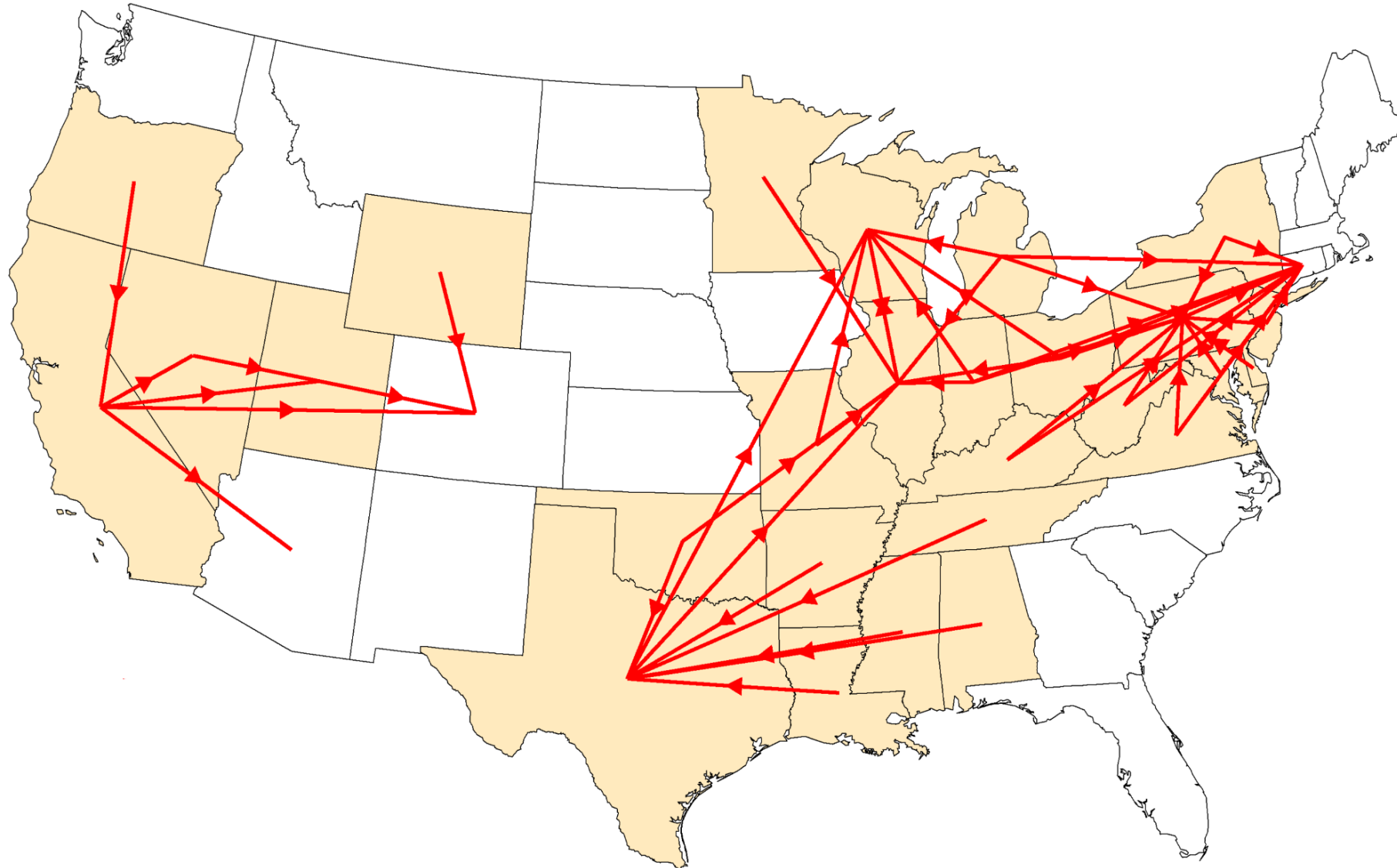
- Ensures states meet their obligations under the Clean Air Act’s “Good Neighbor” provision for the 2015 ozone National Ambient Air Quality Standards (NAAQS)
  - Requires upwind states to eliminate their significant contribution to nonattainment, or interference with maintenance, of the NAAQS in other downwind states. 42 USC 7410(a)(2)(D)(i)(I).
- Proposed rule applies 4-step interstate transport framework for establishing Good Neighbor requirements
  - Updates to keep pace with more protective NAAQS, updated evaluation of ozone transport, and latest technical analysis
  - Identifies 27 states that contribute above 1% of the NAAQS to downwind air quality problems for purposes of the Good Neighbor provision
  - Determines required reductions in ozone precursor emissions (NO<sub>x</sub>) for 26 of the 27 states
    - 25 states subject to requirements for Electric Generating Units (EGUs)
    - 23 states subject to requirements for certain industrial source categories (non-EGUs)
  - Sets forth Federal Implementation Plans (FIP) requirements for states where EPA disapproves Good Neighbor State Implementation Plans (SIP) and for states for which EPA has made Findings of Failure to Submit

# The 4-Step Interstate Transport Framework

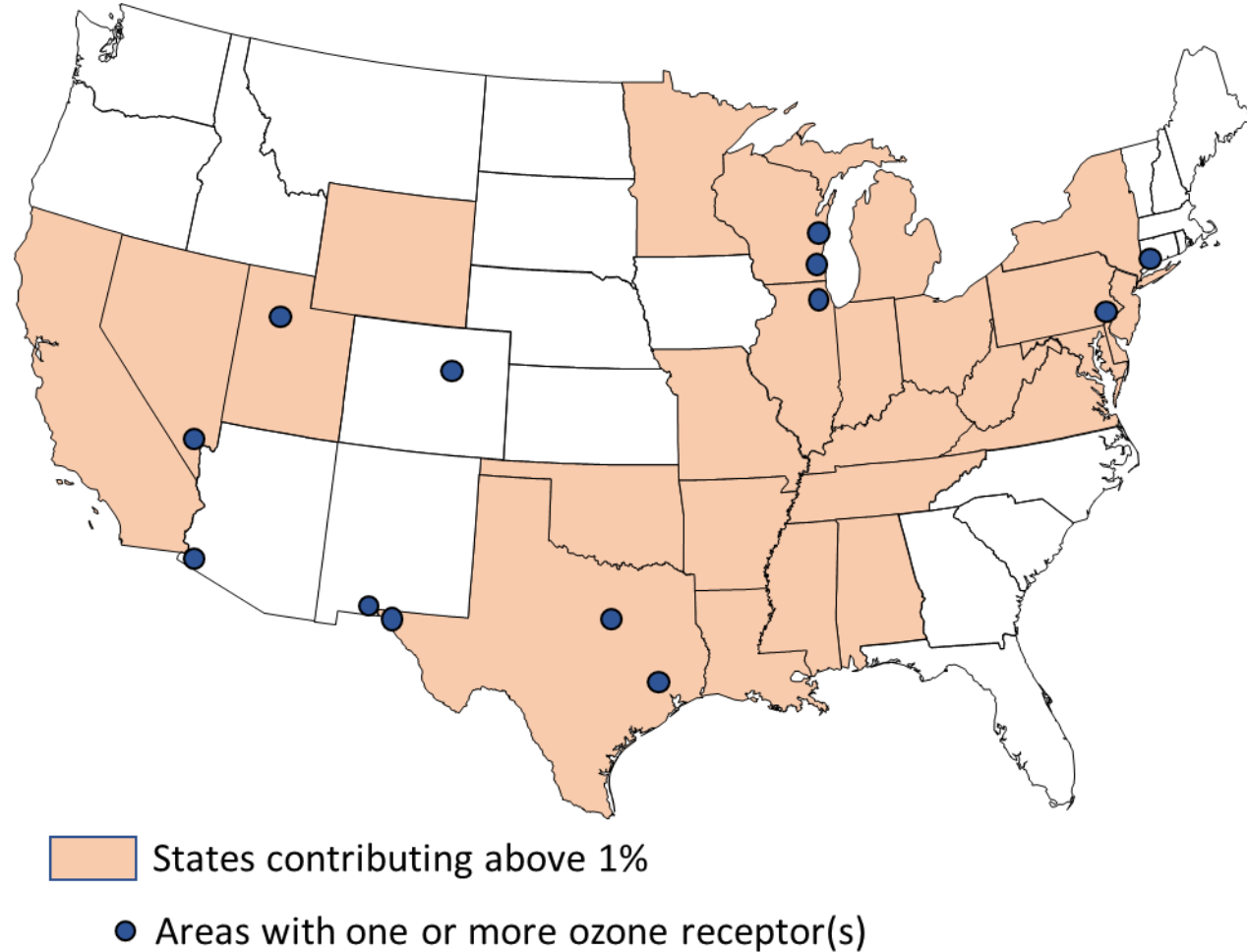
EPA evaluates SIPs and/or prepares FIPs using the 4-step interstate transport framework to quantify necessary emissions reductions to address interstate ozone pollution (defined as “significant contribution”).

- 1 Identify downwind receptors expected to have problems attaining or maintaining the NAAQS.
- 2 Determine which upwind states are “linked” to these downwind air quality problems and thereby warrant further analysis of their emissions.
- 3 For states linked to downwind air quality problems, identify upwind emissions on a statewide basis that significantly contribute to nonattainment or interfere with maintenance of a standard in any area, using a multifactor analysis.
- 4 For upwind states that are found to have emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, implement the necessary emissions reductions within the state.

# Upwind States Contributing Above 1% of the 2015 ozone NAAQS



# Transport Linkages for 2015 Ozone NAAQS\*

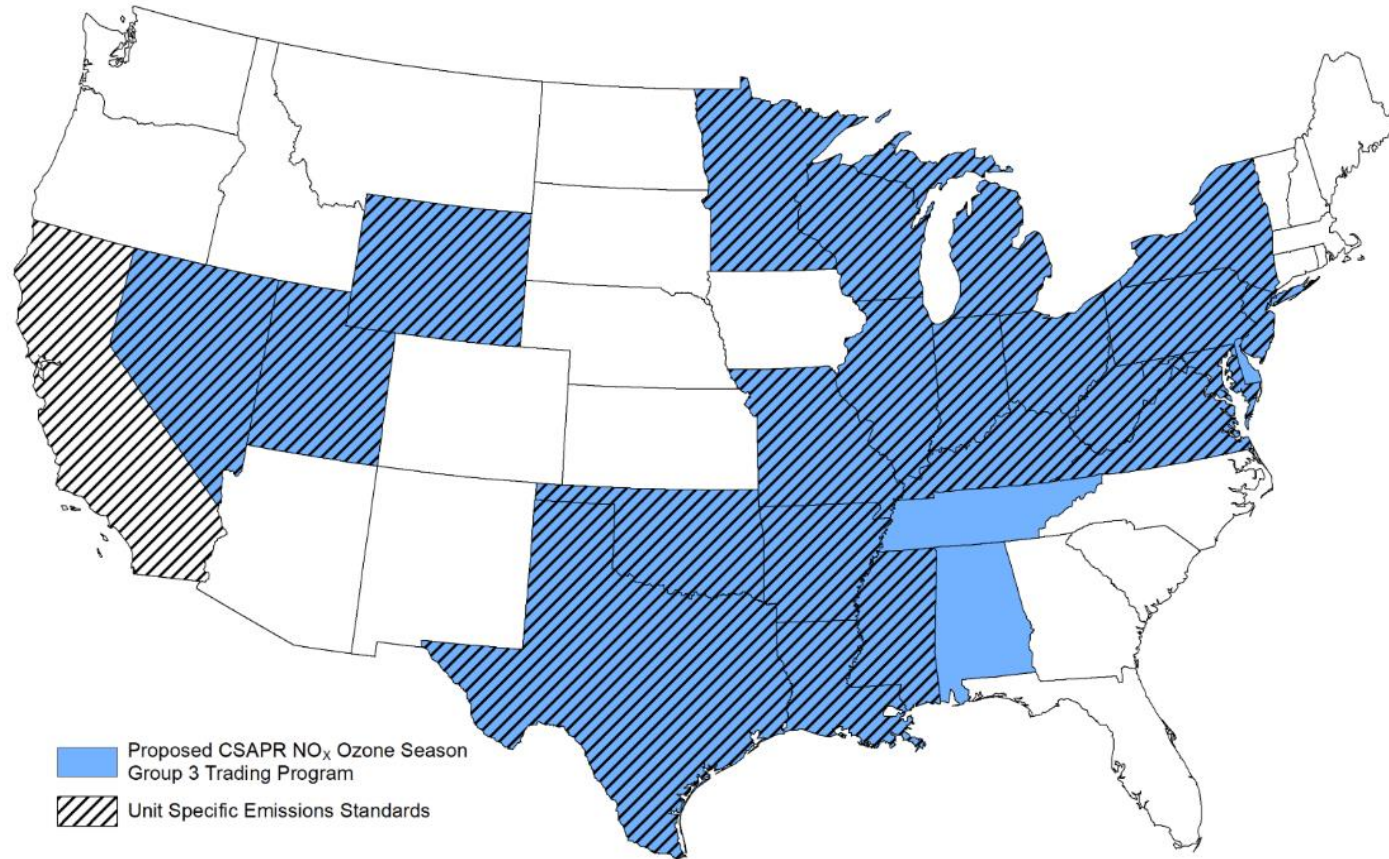


**Step 1:** EPA identified 36 nonattainment and maintenance problems in the following areas: **Yuma, AZ; Denver, CO; Coastal CT; Chicago, IL; Las Vegas, NV; Doña Ana, NM; Philadelphia, PA; Dallas, TX; El Paso, TX; Houston, TX; Salt Lake City, UT; and along the western shoreline of Lake Michigan in WI.**

**Step 2:** EPA identified 26 upwind states that are contributing above 1% of the NAAQS or 0.70 ppb to downwind air quality problems: **Alabama; Arkansas; California; Delaware; Illinois; Indiana; Kentucky; Louisiana; Maryland; Michigan; Minnesota; Mississippi; Missouri; Nevada; New Jersey; New York; Ohio; Oklahoma; Pennsylvania; Tennessee; Texas; Utah; Virginia; West Virginia; Wisconsin; and Wyoming**

\*EPA proposes to find that Oregon is not linked due to unique circumstances of ozone contributions at monitors in CA

# Proposed Rule Covered Geography



**25 states subject to participation in EGU allowance-based trading program beginning in 2023:** Alabama, Arkansas, Delaware, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming

**23 states subject to non-EGU unit-specific emissions limitations beginning in 2026:** Arkansas, California, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming

# Non-EGU Source Categories Covered by Proposed FIP

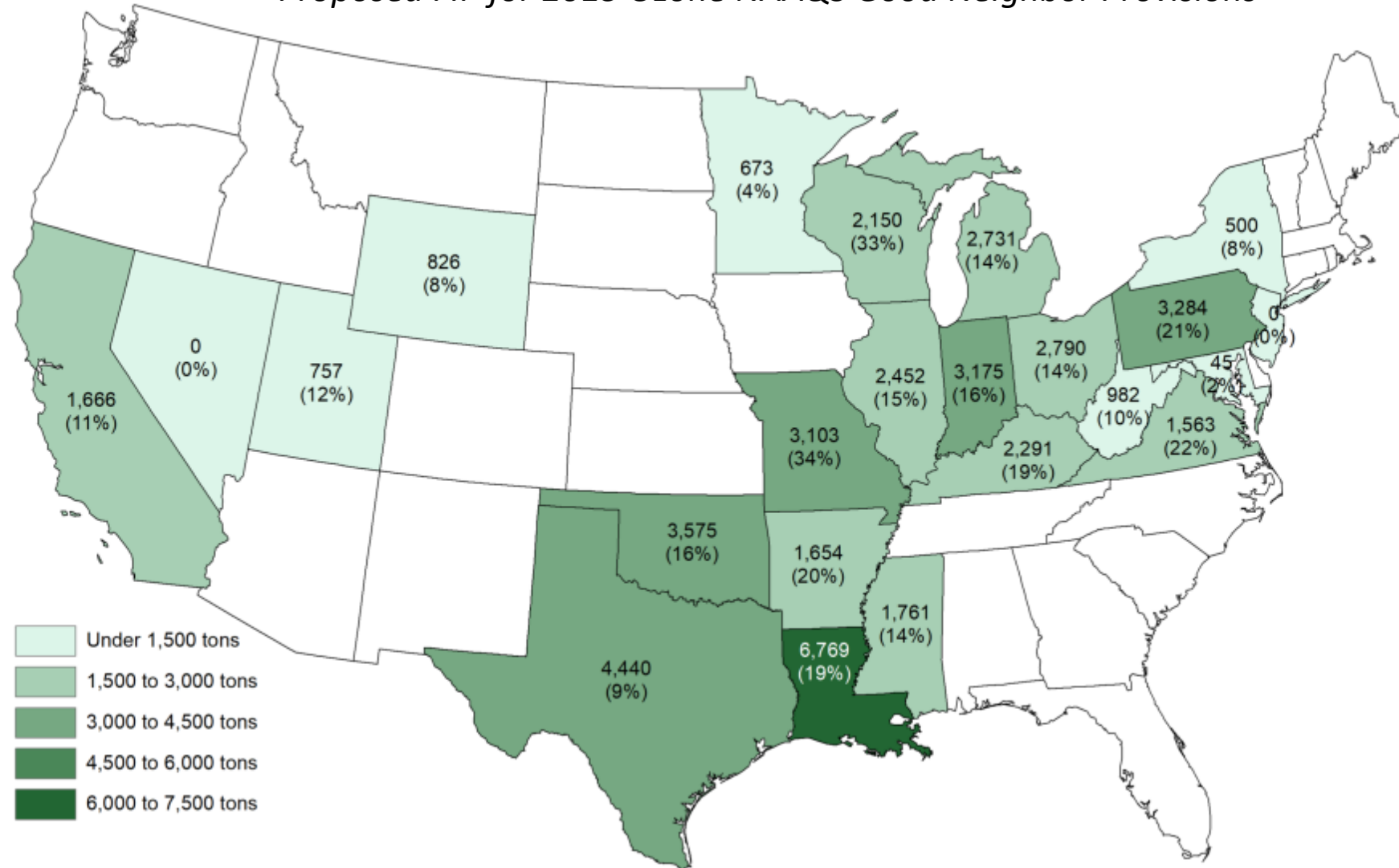
---

- Reciprocating internal combustion engines in *Pipeline Transportation of Natural Gas*
- Kilns in *Cement and Concrete Product Manufacturing*
- Boilers and furnaces in *Iron and Steel Mills and Ferroalloy Manufacturing*
- Furnaces in *Flat Glass and Glass Products Manufacturing* (includes flat glass, glass container, pressed and blown glass and glassware manufacturing)
- Boilers in *Basic Chemical Manufacturing*
- Boilers in *Petroleum and Coal Products Manufacturing*
- Boilers in *Pulp, Paper, and Paperboard Mills*



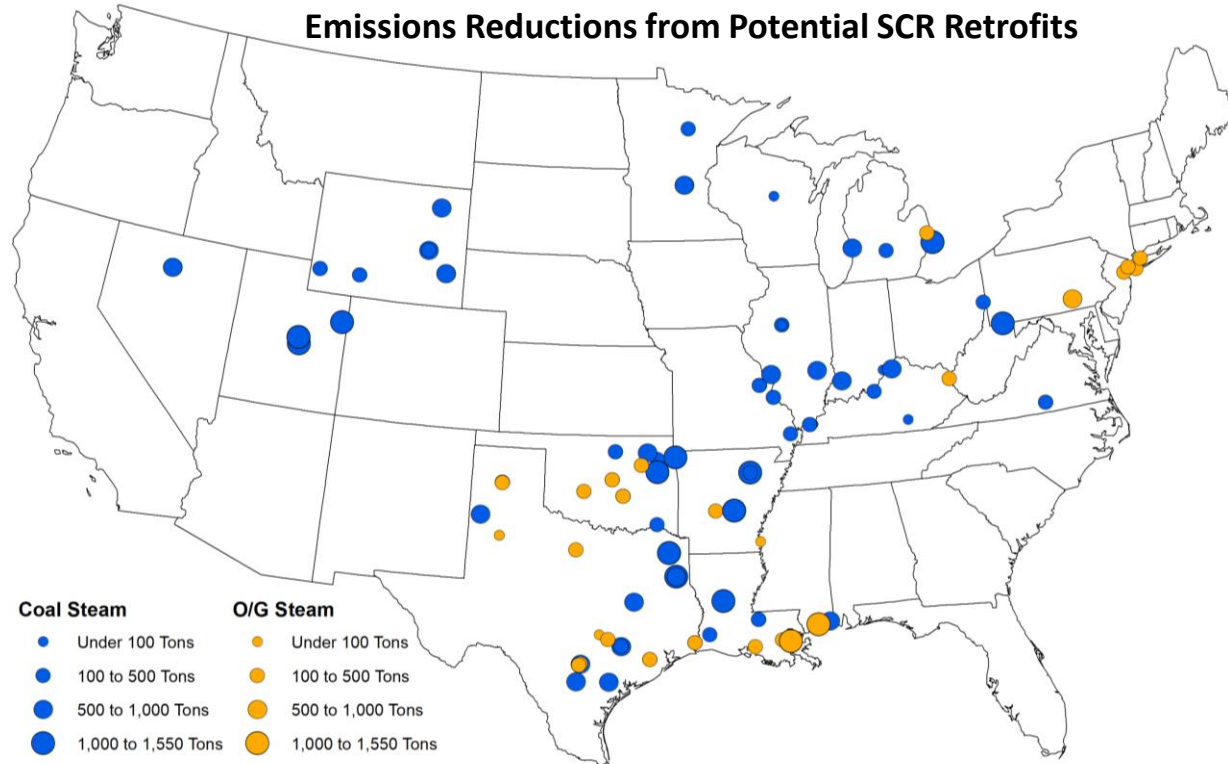
# Non-EGU NOx Emissions Reductions in 2026 Relative to 2019

*Proposed FIP for 2015 Ozone NAAQS Good Neighbor Provisions*



# EGU NOx Emissions Reduction Potential

- Proposing NOx emissions reductions commensurate with new SCRs (or SNCRs for certain types) on all coal-fired EGUs, as well as on larger oil/gas steam EGUs that operate relatively frequently
  - Also requiring emission reductions from optimizing existing pollution controls and upgrading combustion controls
- Relative to current emission levels, SCR retrofits can deliver 64,000 tons of NOx emissions reductions (~70% of rule's EGU potential) in 2026
  - For Coal (~42 GW):** Between \$6,500/ton and \$20,900/ton, with an average of \$11,000/ton
  - For Oil/Gas Steam (~19 GW):** Between \$4,500/ton and \$15,300/ton, with an average of \$7,700/ton



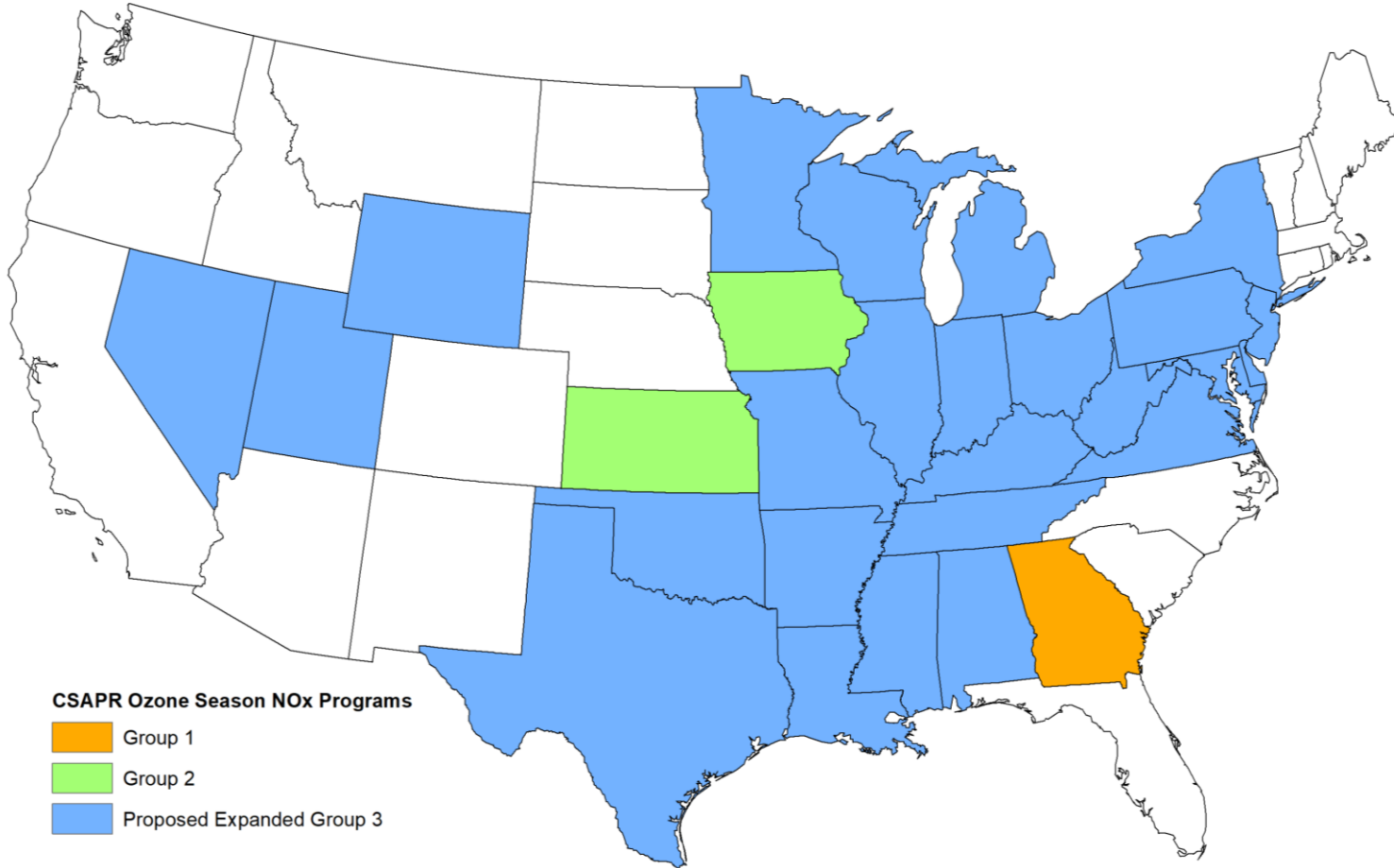
*Preliminary numbers subject to change*

Emissions (tons) that could be reduced with SCR retrofit in 2026			
State	Coal Steam	O/G Steam	All Steam
Texas	11,671	3,172	14,843
Utah	7,068	0	7,068
Louisiana	2,078	3,134	5,212
Wyoming	4,921	0	4,921
Arkansas	4,669	198	4,867
Oklahoma	3,091	1,746	4,837
Missouri	4,271	0	4,271
Michigan	3,235	184	3,419
Kentucky	2,944	188	3,132
Other	8,670	3,233	11,903
<b>Total</b>	<b>52,618</b>	<b>11,856</b>	<b>64,473</b>

"Other" states include Illinois, Indiana, Minnesota, Mississippi, Nevada, New York, Ohio, Pennsylvania, Virginia, West Virginia, and Wisconsin

# Coverage of CSAPR Ozone Season Trading Programs

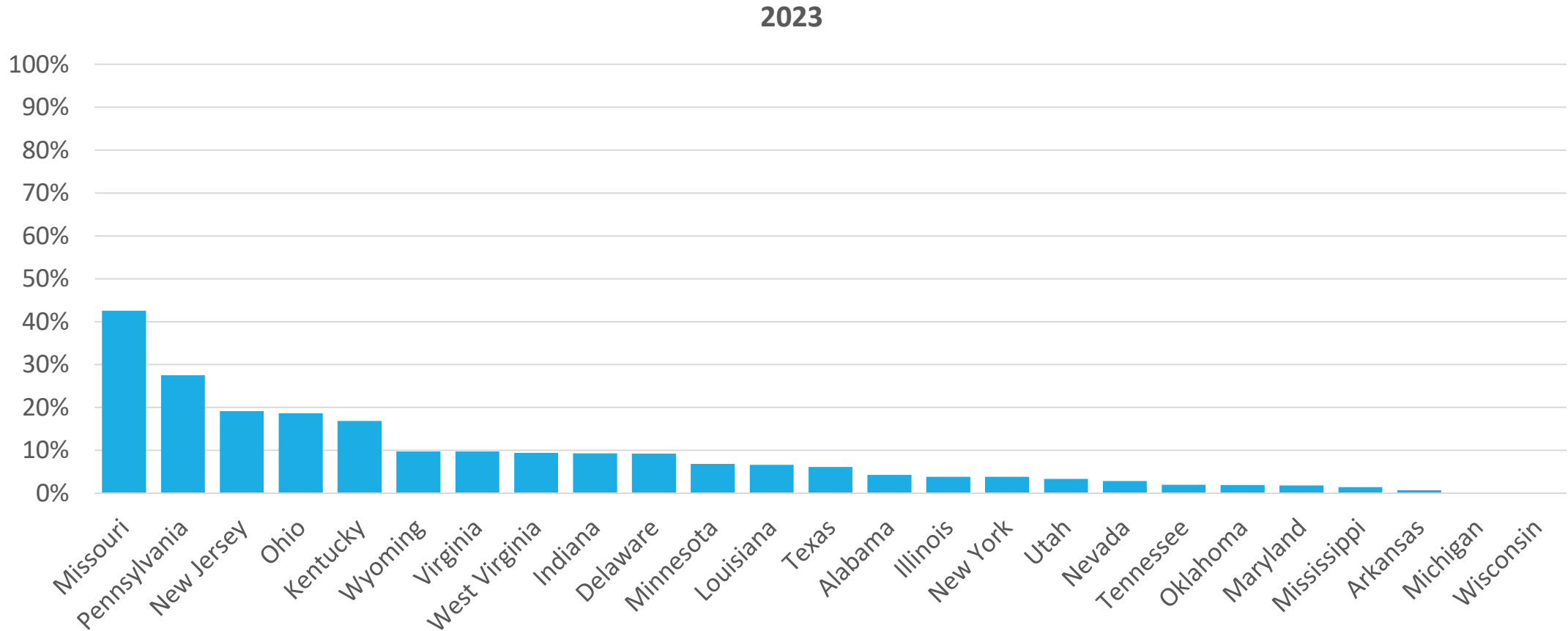
**Proposed expanded Group 3 CSAPR trading program includes 25 States with EGU NOx emissions reduction requirements**



- 12 states currently in Group 3 from previous CSAPR rulemakings
  - IL, IN, KY, LA, MD, MI, NJ, NY, OH, PA, VA, WV
- 8 states moving from Group 2 to Group 3
  - AL, AR, MO, MS, OK, TN, TX, WI
- 5 states not previously covered
  - DE, MN, NV, UT, WY

# Relative NOx Emissions Reductions: 2023

Near-term emissions reductions are small and largely based on operating existing controls

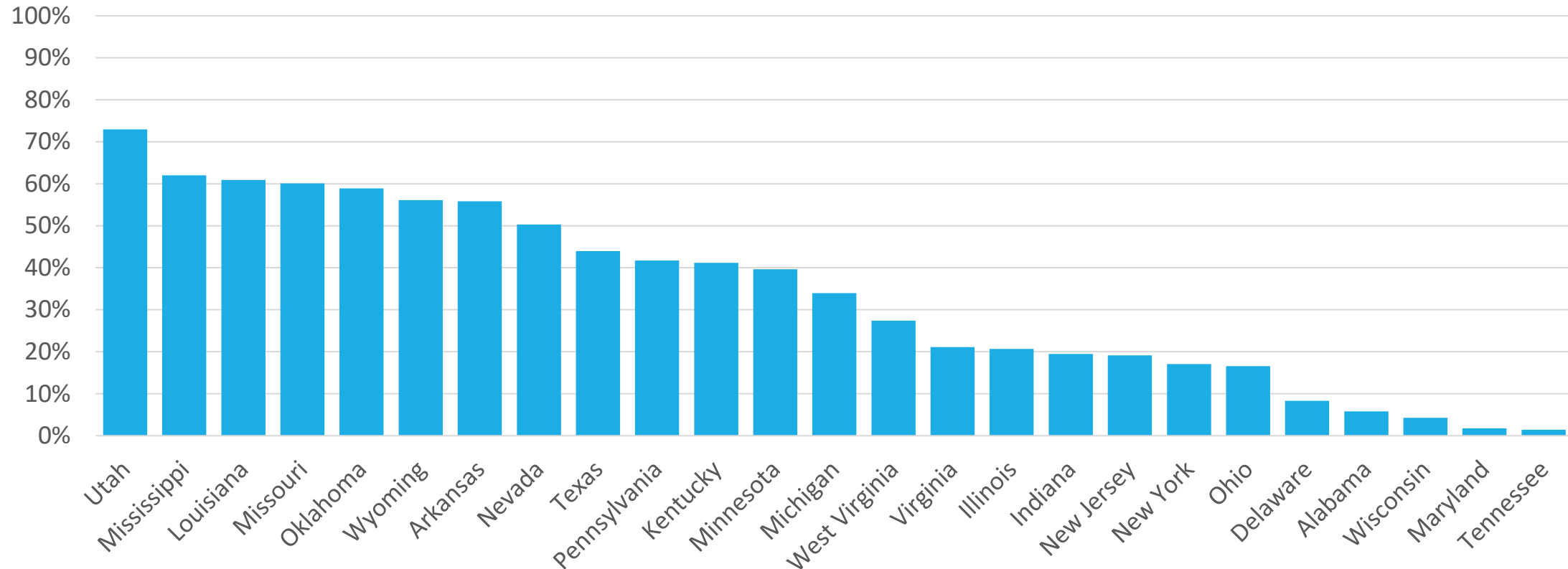


-These emissions reductions reflect values from current levels and announced changes. Actual incremental reductions in 2023 will likely be smaller as some coal would be projected to retire in the baseline

# Relative NOx Emissions Reductions: 2026

Longer-term emissions reductions reflect reduction potential from SCR retrofit

2026 (based on illustrative budgets)

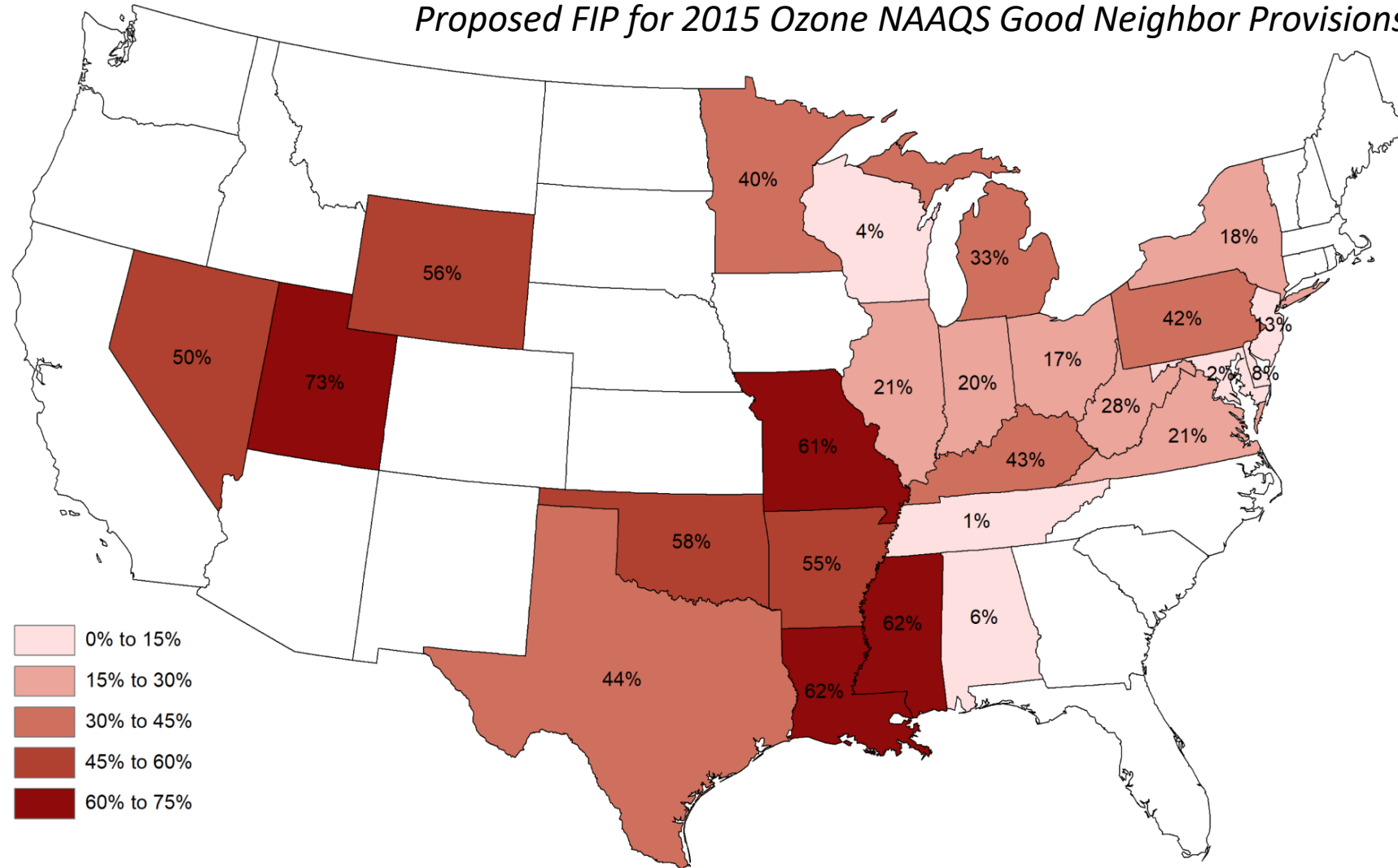


-These emissions reductions reflect values from current levels and announced changes. Actual incremental reductions in 2026 will likely be smaller as some coal would be projected to retire in the baseline

# EGU NOx Emissions Reductions in 2026 Relative to 2021

(Adjusted for known retirements and new builds\*)

*Proposed FIP for 2015 Ozone NAAQS Good Neighbor Provisions*



\*The estimated emissions reductions reflect the difference between the proposed rule's 2026 illustrative budgets for EGUs and current 2021 adjusted emissions for those EGUs (e.g., 2021 reported emissions adjusted to account for the removal of units known to have since retired or the addition of emissions from under-construction new fossil plants). In other words, the estimated reductions reflect changes known to have happened and be happening in the power sector, as well as the impact of the proposed rule. Because these estimated reductions reflect the overall change from current levels of operation, they are higher, on average, than the values reflected in the regulatory impact analysis (emissions reductions relative to projected future levels of operation) and other communications materials for the proposal.

# Allowance Trading Program

- Proposed rule relies on a FIP framework that reduces EGU emissions through an allowance trading program in 25 states
  - Designed to provide greater levels of cost-effective NO<sub>x</sub> emissions reductions than achievable through source-specific limits; provide compliance flexibility; protect electric reliability
- Non-EGUs in the 23 states with non-EGU requirements are **not** included in the trading program
- EGUs in covered states required to participate in a revised version of the CSAPR NO<sub>x</sub> Ozone Season Group 3 Trading Program
  - Previously established in the Revised CSAPR Update, and as modified through this notice and comment rulemaking process

# Proposed Trading Enhancements

## To maintain environmental rigor:

Incorporate **dynamic budgets** based on more current information about the EGU fleet

- Recalibrate budgets annually via ministerial actions, adjusting for new retirements, new units, and generation shifting

**Restricted bank size** to limit the quantity of accumulated banked allowances

- Limit bank to 10.5% of the budget by reconverting the bank annually to prevent excessive growth

## To promote more consistent operation and optimization of emissions controls at individual EGUs:

Include **backstop daily emissions rate** limits on large coal-fired units

- Require a 3-to-1 allowance surrender to cover excess emissions above the daily rate
- 2024 compliance for coal with existing SCR; 2027 for coal units with retrofit potential



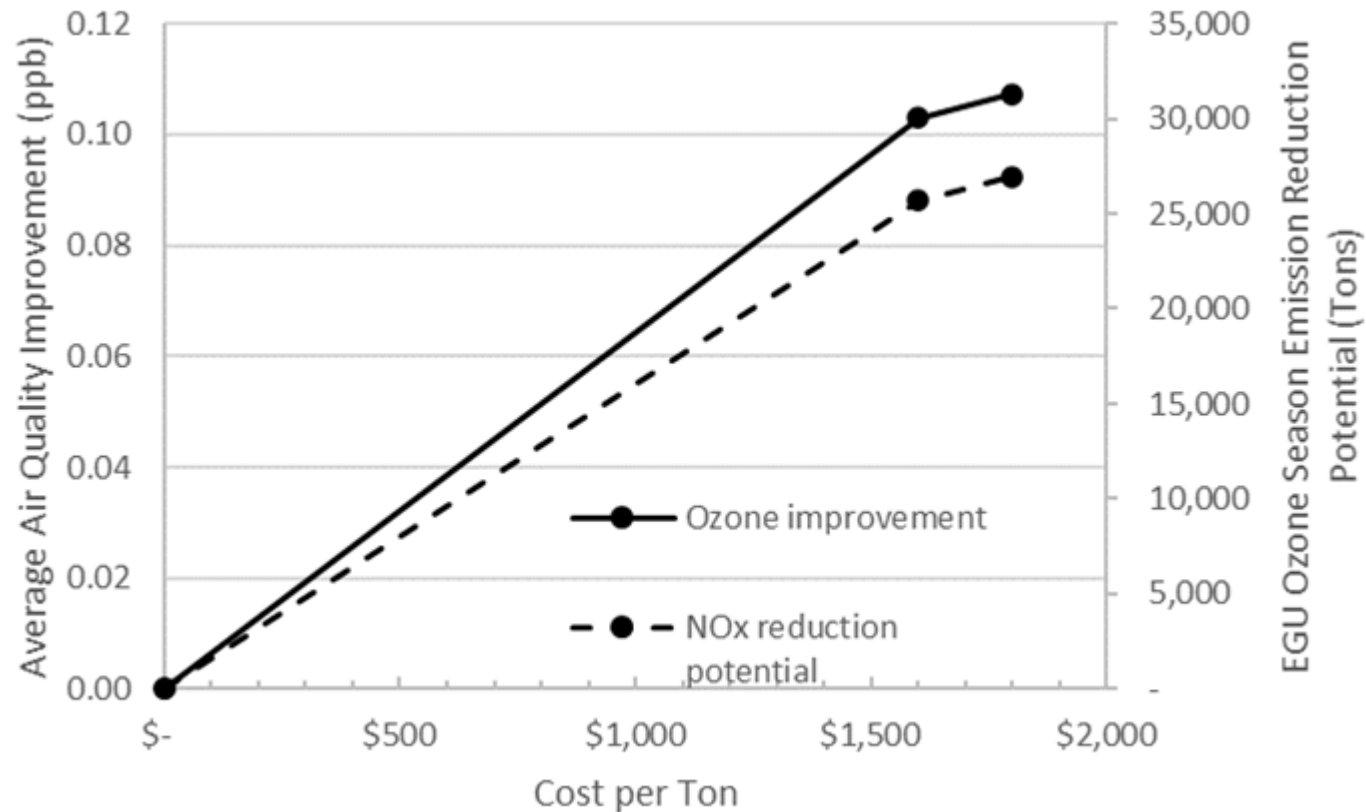
# Benefits and Costs

- In 2026, will avoid 1,000 premature deaths, reduce hospital and emergency room visits for thousands of people with asthma and other respiratory problems, help keep hundreds of thousands of children and adults from missing school and work due to respiratory illness, and decrease asthma symptoms for millions of Americans.
- **Monetized health benefits** in 2026 would be at least \$9.3 billion and could be as high as \$18 billion (2016\$, 3 percent discount rate).
- **Annualized monetized climate benefits** using the SC-GHG Interim Estimates would be around \$1.5 billion (2016\$, 3 percent discount rate, each year over the period 2023-2042)
- **Costs:** In 2026, the cost of achieving these reductions would be approximately \$1.1 billion (2016\$), a fraction of the estimated value of the benefits
- Annually, the **net monetized health benefits (not including monetized climate benefits)** after accounting for the costs of compliance - would be \$15 billion (2016\$, 3 percent discount rate) each year over the period from 2023 to 2042.

**Thank you!**

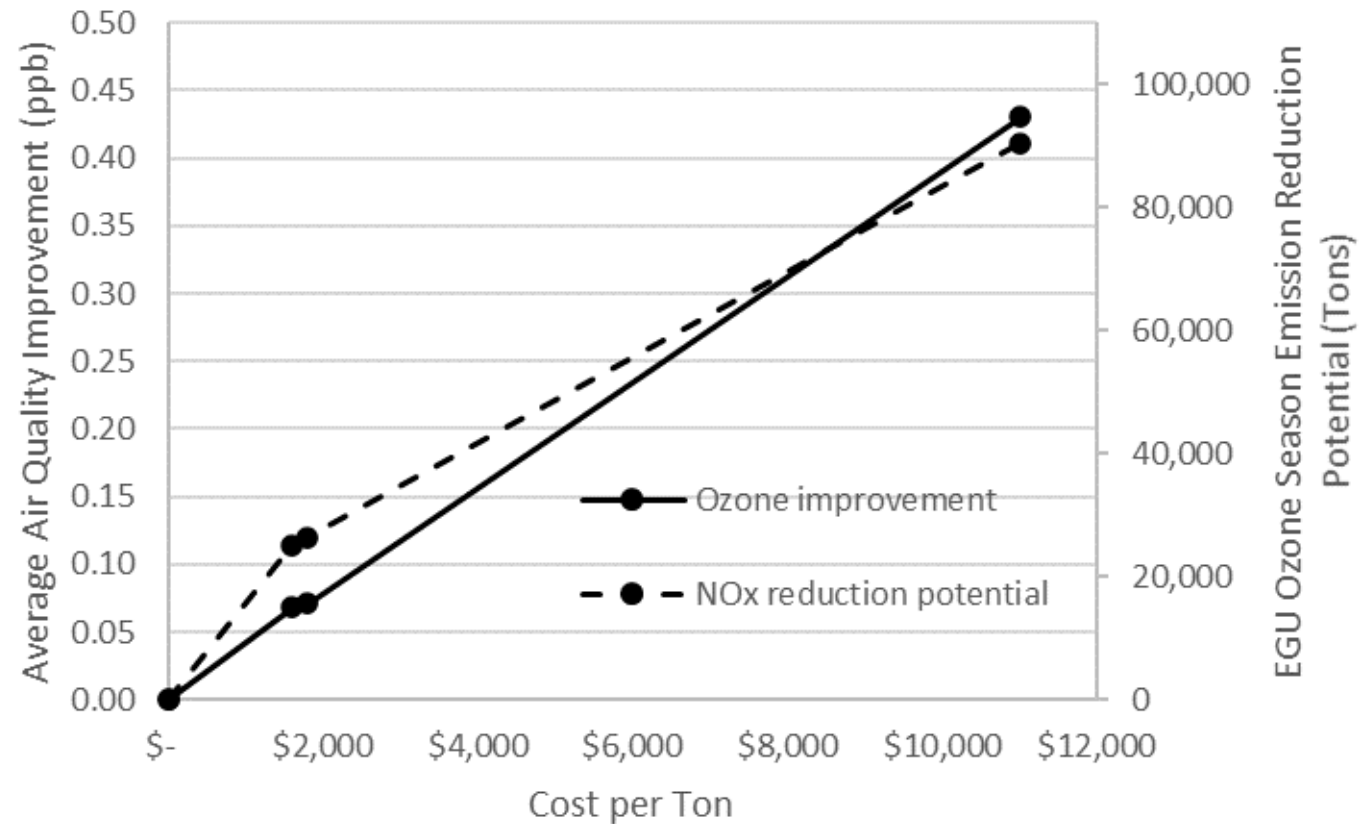
# Figures from Appendix G to Ozone Transport Policy Analysis Proposed Rule TSD

Figure 1 to Section VI.D.1 – EGU Ozone Season NO<sub>x</sub> Reduction Potential in 26 Linked States and Corresponding Total Reductions in Downwind Ozone Concentration at Nonattainment and Maintenance Receptors for Each Cost Threshold Level Evaluated (2023)



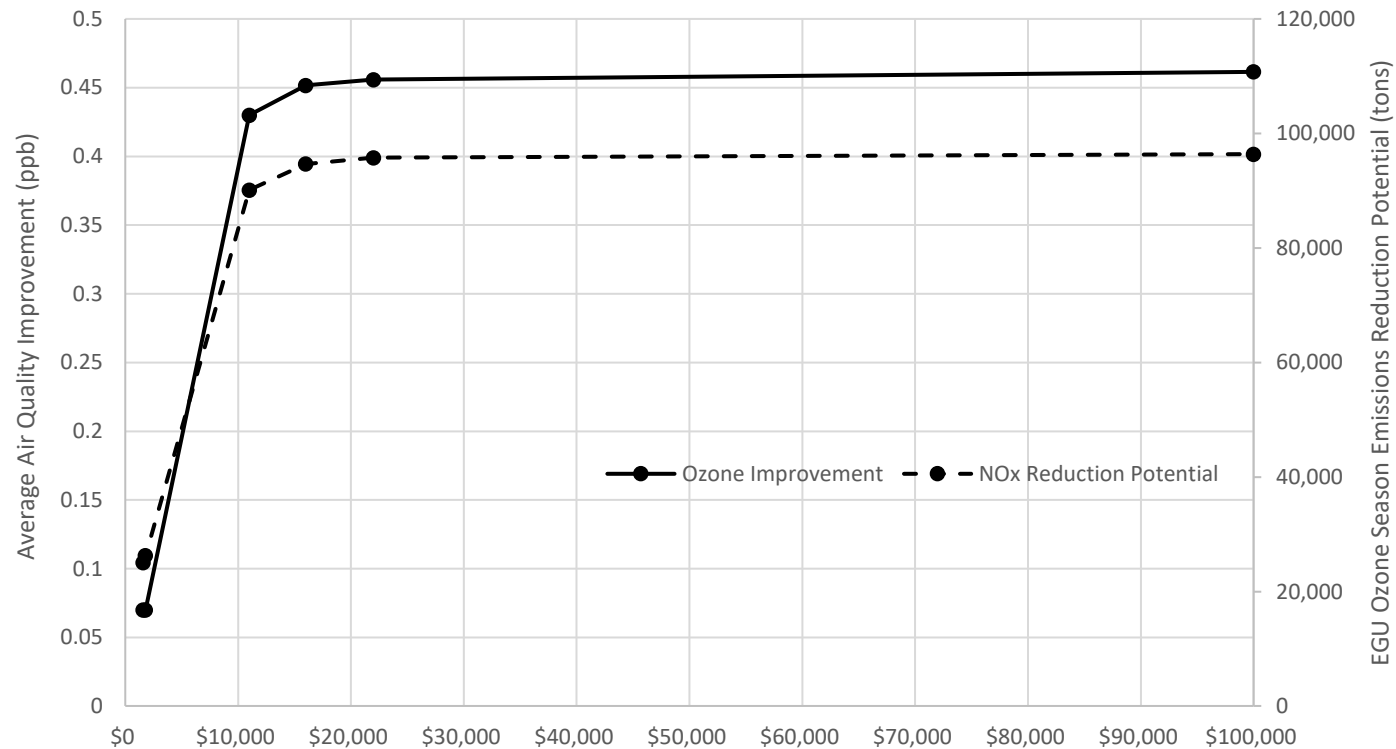
# Figures from Appendix G to Ozone Transport Policy Analysis Proposed Rule TSD

Figure 2 to Section VI.D.1: EGU Ozone Season NO<sub>x</sub> Reduction Potential in 23 Linked States and Corresponding Total Reductions in Downwind Ozone Concentration at Nonattainment and Maintenance Receptors for Each Cost Threshold Level Evaluated (2026)



# Figures from Appendix G to Ozone Transport Policy Analysis Proposed Rule TSD

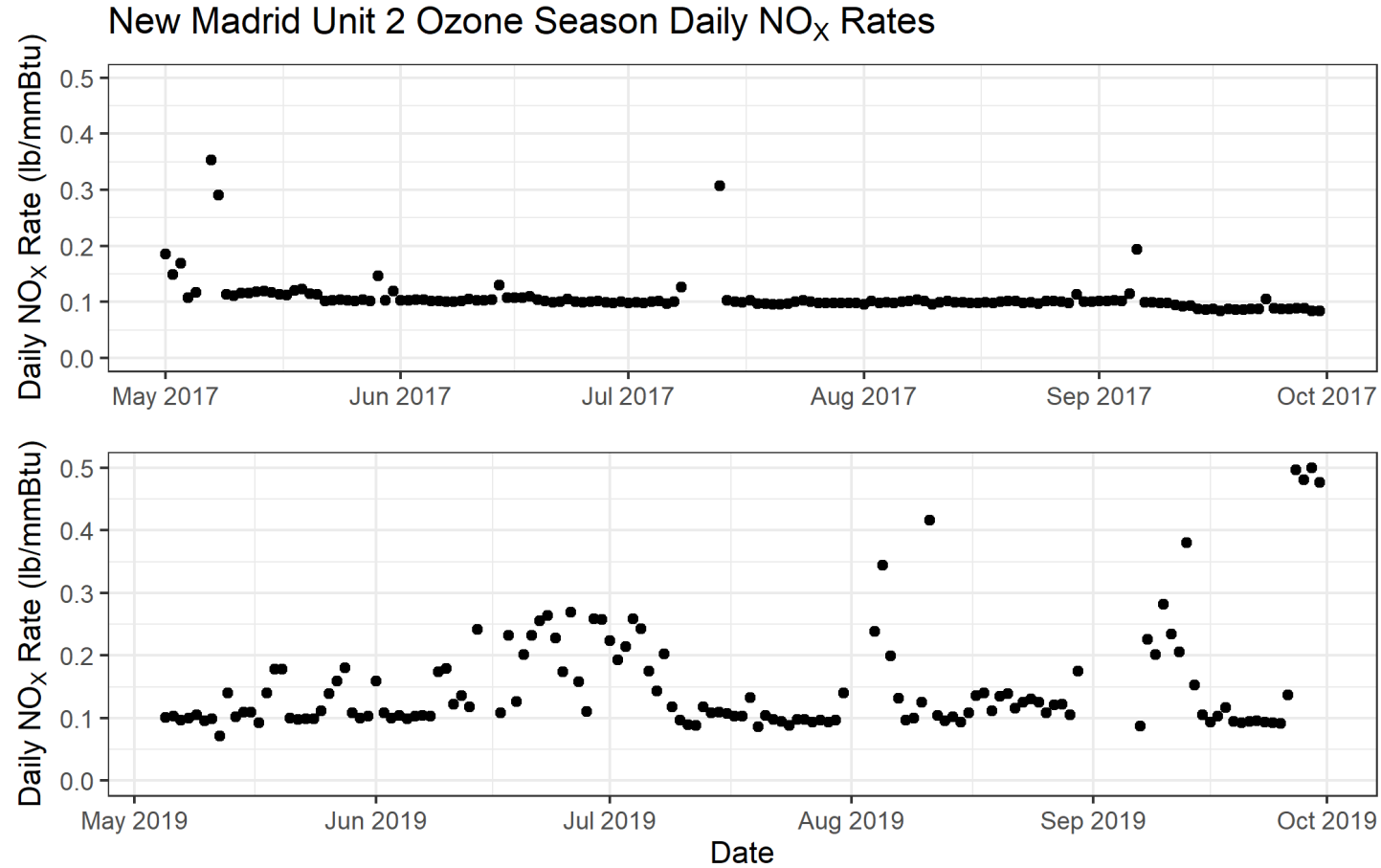
**Figure 3 to Section VI.D.1: EGU Ozone Season NO<sub>x</sub> Reduction Potential in 23 Linked States and Corresponding Total Reductions in Downwind Ozone Concentration at Nonattainment and Maintenance Receptors for Each Cost Threshold Level Evaluated and Illustrative Evaluation of Cost Thresholds beyond Identified Technology Breakpoints (2026)**



For the evaluation of air quality impacts for the cost levels beyond our technology breakpoints (i.e., beyond \$11,000 per ton), the EPA relies on an average air quality per ton reduction factor derived from its AQAT analysis. The EPA notes that these illustrative points (those beyond \$11,000 per ton) reflect SCRs on steam units less than 100 MW and o/g steam units < 150 tons per season, combustion control upgrade on combustion turbines, and SCRs on combustion turbines > 100 MW respectively. These mitigation measures and costs are further discussed in the EGU NO<sub>x</sub> Mitigation Strategies Proposed Rule TSD.

# Figures from Appendix G to Ozone Transport Policy Analysis Proposed Rule TSD

Figure 1 to Section VII.B.1.c.i: New Madrid Unit 2 Daily Emissions Rate (2017 and 2019)



# Figures from Appendix G to Ozone Transport Policy Analysis Proposed Rule TSD

Figure 2 to Section VII.B.1.c.i: Conemaugh Unit 2 Daily Emissions Rate (2017 and 2019)

