

# The next big reliability challenge: EPA revised ozone standard

Eugene M. Trisko  
Attorney-at-Law

SSEB Clean Coal Technology Committee  
Kingsport, TN  
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# Background

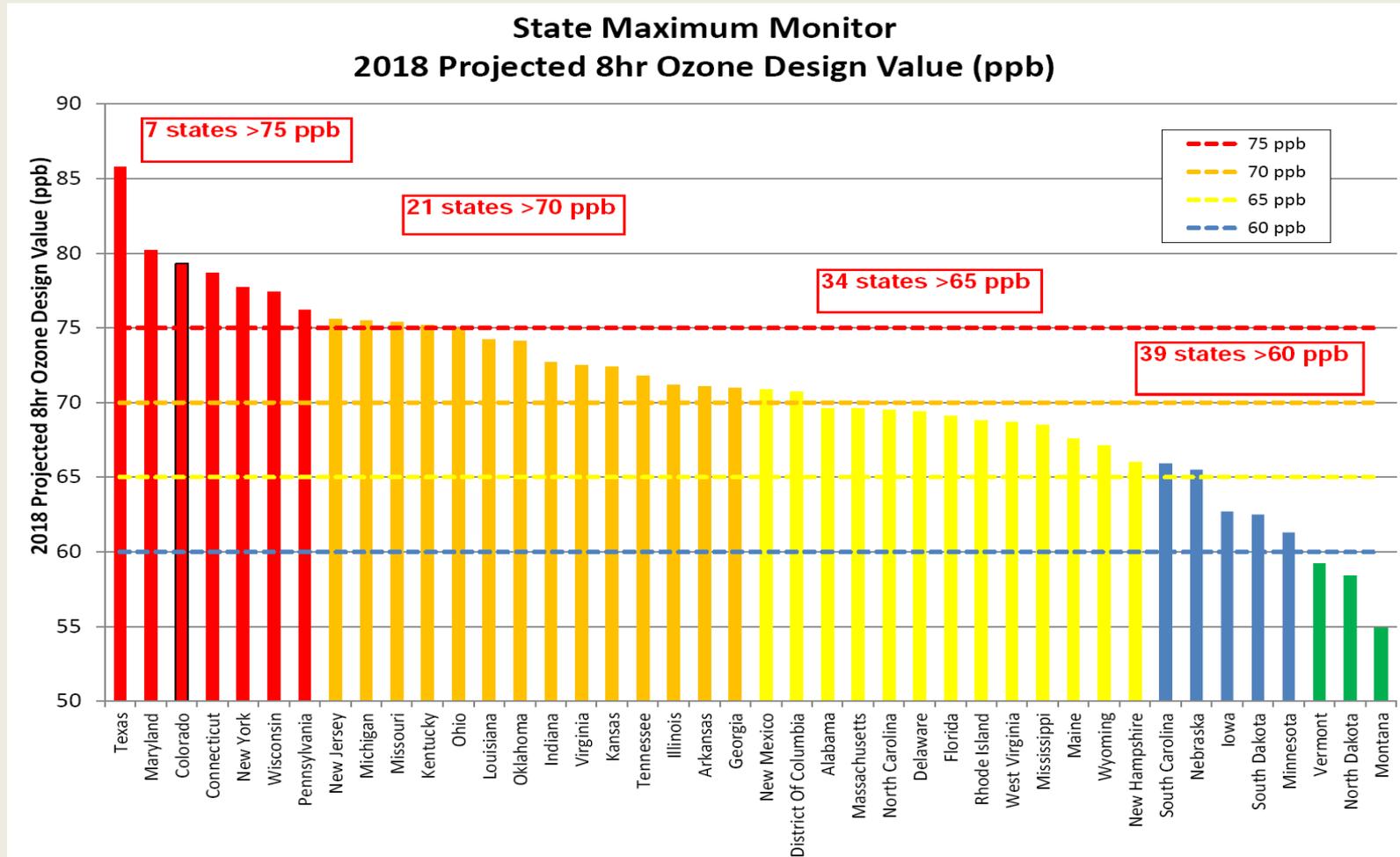
- EPA is proposing to lower the current 75 ppb primary ozone standard to a level of 65 to 70 ppb, and is taking comment on a 60 ppb standard.
- EPA air quality modeling for a revised standard shows substantial areas of ozone nonattainment in 2025 at either 65 or 70 ppb, assuming full implementation of the carbon rule with State Option I, including 49 GW of coal retirements.
- A revised standard would be implemented circa 2022 in most areas other than California.
- Nonattainment area designations would be based on 2014-16 or 2015-17 air quality data.

# Air quality metrics

- 2018 EPA/LADCO ozone modeling projections, assuming full implementation of MATS rule and related coal unit retirements.
- 2012-2014 state ozone monitoring design values (reasonable proxy for 2014-16 ozone air quality measures that EPA would use for nonattainment area designations.)



# High hurdles: EPA/LADCO projections of 2018 highest ozone monitor 3-year design values

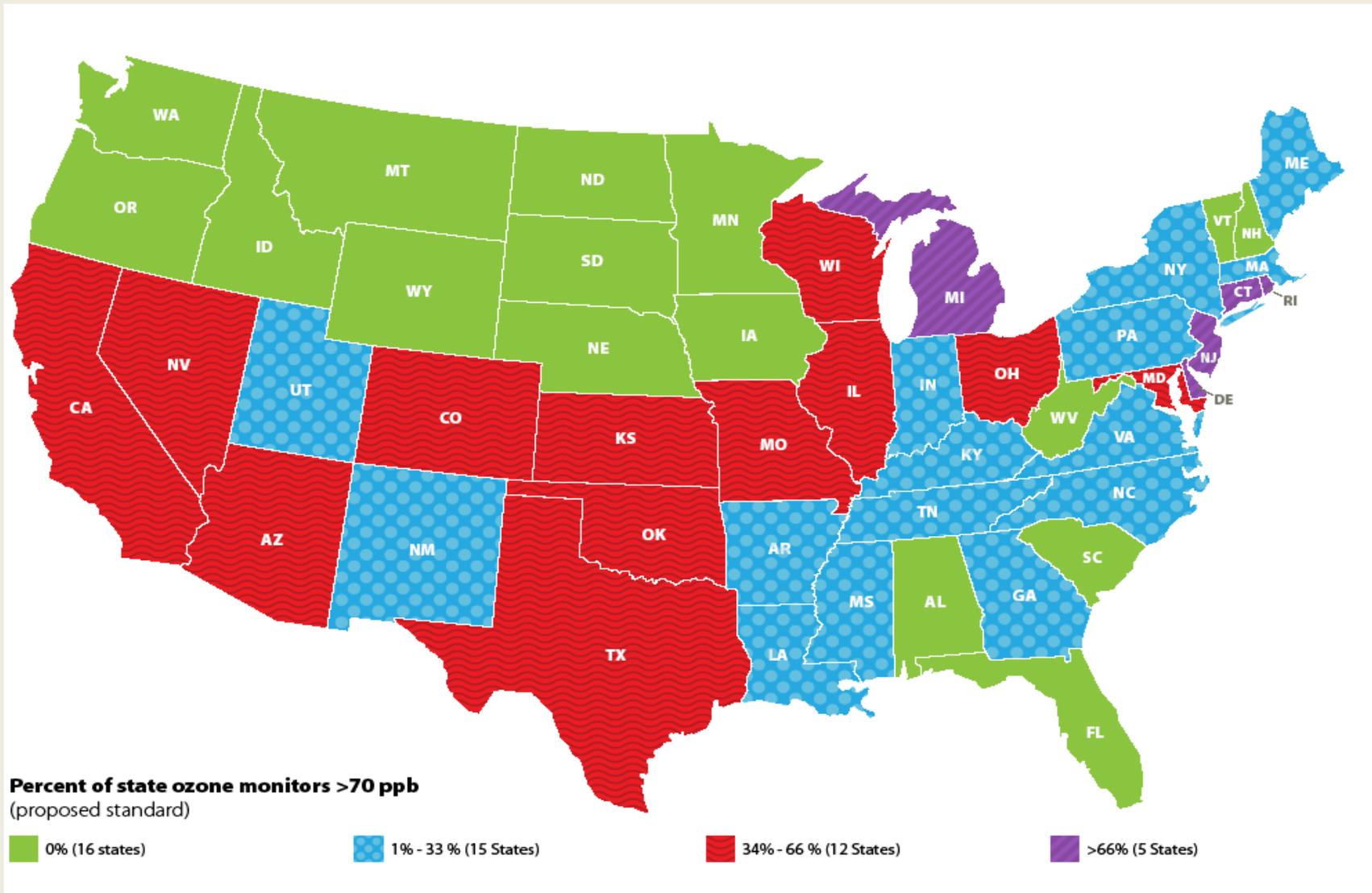


Note: Assumes CSAPR and MATS controls, w/o Clean Power Plan.

# State Attainment with Proposed EPA 8-Hour Ozone Standards Based on 2012-14 Ozone Design Values

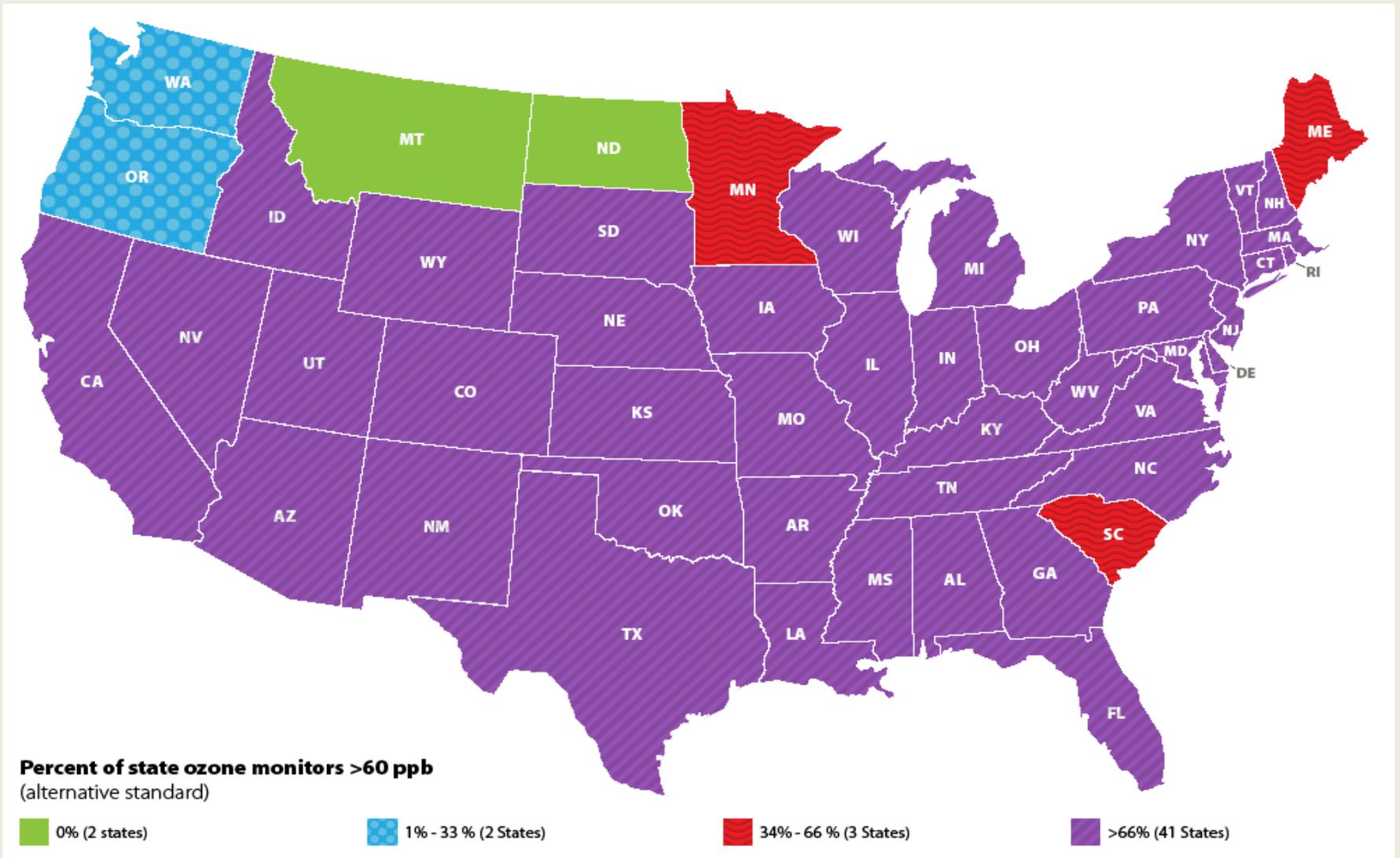
Source: 2012-14 monitor data  
downloaded from EPA as of February  
2015, compiled by Alpine Geophysics.

# Pct. of state monitors >70ppb





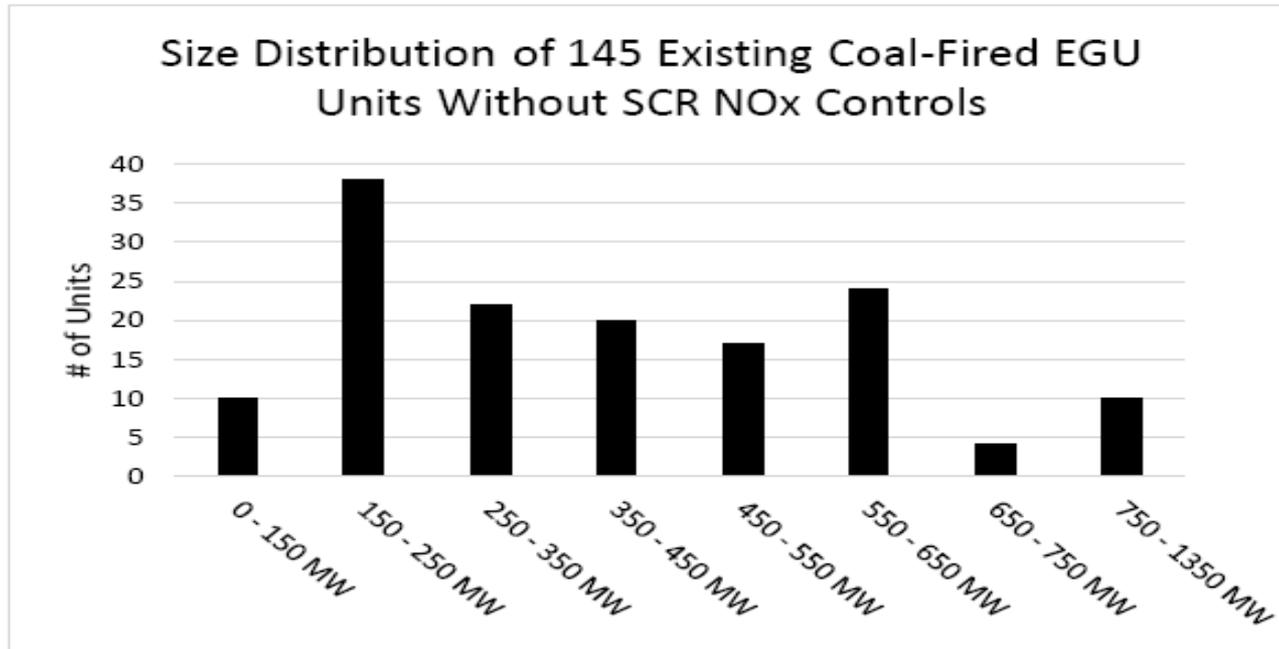
# Pct. of state monitors >60ppb



## Reliability risks: an additional 50 GW of coal unit retirements

- Some 40-50 GW of coal capacity is expected to be retired over 2015-17 due to the MATS rule and other factors.
- EPA projects an additional 41-49 GW of coal retirements due to the Clean Power Plan in 2020.
- EPA estimates that NO<sub>x</sub> reductions needed for attainment of a 65 or 70 ppb standard would include EGU reductions from the retrofit of 7 GW to 51 GW of SCRs on the post-CPP coal fleet.
- SCR retrofit requirements would trigger additional coal plant retirements due to the high capital and variable costs of SCRs.
- If the 49 GW of coal retirements due to the CPP were not included in EPA's modeling (carbon rule is delayed, etc.), most of the CPP coal baseload capacity at risk likewise would be subject to SCR retrofits with a standard such as 65 ppb.

Size distribution of EGUs subject to SCR retrofits: 107 of 145 units are <550 MW (least likely to retrofit)



**Figure 10-1. Size Distribution of 145 Existing Coal-Fired EGU Units without SCR NOx Controls**

Source: EPA Ozone RIA (2014).

# SCR retrofit economics

- 107 of 145 EPA's targeted coal units are smaller than 550 MW
- These smaller units average 243 MW and are now 49 years old (DOE/NETL database)
- Using EPA SCR capital cost estimates for a 300 MW unit, and a 10-year cost recovery period with 7.75% weighted average cost of capital, generation cost increases would exceed \$7/MWh for capital recovery alone.
- Most of these units are more likely to retire than retrofit – creating additional pressures on reliability and natural gas supplies and prices.

## EPA: 79,000 “known” NO<sub>x</sub> controls for 65 ppb standard

- EPA has identified 79,000 additional new NO<sub>x</sub> controls for existing stationary, mobile, and area sources that could supply 60% of the NO<sub>x</sub> reductions needed for a 65 ppb standard.
- The detailed control spreadsheet by state, industry sector, and source is available at:  
<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0169-0025>

# NERA: 65 ppb standard costs, state GDP impacts and job losses

NERA Estimated Economic Impacts of 65 ppb Ozone Standard			
State	Gross State Product Lost 2017-2040	Lost Jobs or Job Equivalents per year	Total Compliance Cost
Alabama	\$17 Billion	7,580	NA
Arizona	\$7 Billion	NA	\$5 Billion
Arkansas	\$9 Billion	23,414	\$17 Billion
California	\$233 Billion	149,554	\$106 Billion
Colorado	\$16 Billion	10,525	\$815 Million
Connecticut	\$37 Billion	21,666	\$22 Billion
Delaware	\$13 Billion	7,928	\$9 Billion
Florida	\$25 Billion	22,838	NA
Georgia	\$22 Billion	11,647	NA
Idaho	\$4 Billion	3,436	NA
Illinois	\$51 Billion	34,873	\$9 Billion
Indiana	\$24 Billion	17,070	\$1 Billion
Iowa	\$9 Billion	7,741	NA
Kansas	\$32 Billion	45,501	\$16 Billion
Kentucky	\$21 Billion	13,605	\$347 Million
Louisiana	\$3 Billion	33,829	\$43 Billion
Maine	\$10 Billion	6,192	\$5 Billion
Maryland	\$62 Billion	42,306	\$37 Billion
Massachusetts	\$93 Billion	40,260	\$37 Billion
Michigan	\$17 Billion	20,052	\$1 Billion
Minnesota	\$18 Billion	10,959	NA
Mississippi	NA	13,076	\$19 Billion
Missouri	\$18 Billion	29,532	\$9 Billion
Montana	\$7 Billion	2,968	NA
Nebraska	\$5 Billion	4,456	NA
Nevada	\$19 Billion	5,846	\$2 Billion
New Hampshire	\$4 Billion	6,667	\$3 Billion
New Jersey	\$86 Billion	51,020	\$52 Billion
New Mexico	\$8 Billion	9,875	\$5 Billion
New York	\$160 Billion	95,040	\$92 Billion
North Carolina	\$42 Billion	13,457	NA
North Dakota	\$3 Billion	1,779	NA
Ohio	\$22 Billion	22,914	\$840 Million
Oklahoma	\$18 Billion	35,503	\$35 Billion
Oregon	\$8 Billion	5,863	NA
Pennsylvania	\$78 Billion	88,604	\$89 Billion
Rhode Island	\$9 Billion	6,581	\$5 Billion
South Carolina	\$12 Billion	6,617	NA
South Dakota	NA	2,792	NA
Tennessee	\$32 Billion	13,575	\$6 Billion
Texas	\$286 Billion	347,322	\$376 Billion
Utah	\$7 Billion	5,809	\$86 Million
Vermont	\$5 Billion	2,871	\$2 Billion
Virginia	\$69 Billion	39,087	\$35 Billion
Washington	\$16 Billion	9,753	NA
West Virginia	\$17 Billion	10,658	\$2 Billion
Wisconsin	\$30 Billion	24,421	\$10 Billion
Wyoming	\$48 Billion	3,062	\$213 Million

Source: <http://www.nam.org/ozone/>

# Other implications

- A revised ozone standard likely would trigger a new round of Section 126 petitions aimed at stationary sources, as well as a new EPA NO<sub>x</sub> transport rule to replace CSAPR.
- The Clean Power Plan – assumed in EPA's air quality modeling – is a wild card for the emission reductions needed to meet any new standard.
- The post-MATS reliability equation is more complex than we have considered to date.

# Indicated actions

- The ozone standard will not be issued until October 1, 2015.
- Additional high-level political intervention from governors, members of Congress, and other state officials is needed in opposition to revision of the standard @ White House and @EPA.
- SSEB can play a lead role.

# Acknowledgments

- Thanks to SSEB for the invitation here.
- Thanks to ACCCE for supporting this presentation.