

# Impact of Ambient Air Rules for PM<sub>2.5</sub> and Ozone

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# Ozone and PM NAAQS

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## Ozone

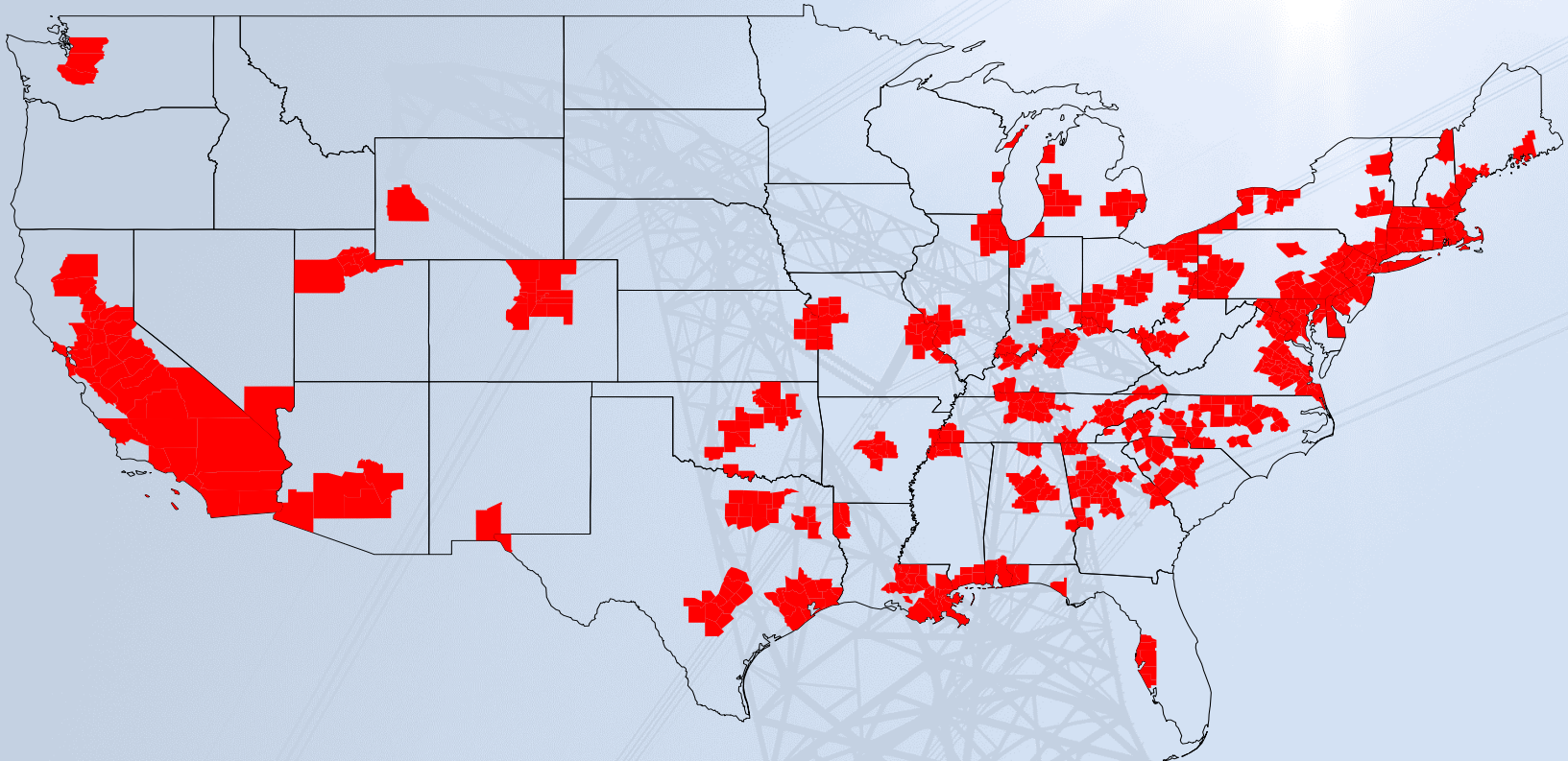
- '97 8-hour standard – 0.080 ppm (0.084 ppm) / 2° same
- '08 standard – 0.075 ppm / 2° same
- '11 standard – 0.060-0.070 ppm / 2°: dose (W126) std. to protect crops

## Fine Particles (PM<sub>2.5</sub>)

- '97 standard – 15 ug/m<sup>3</sup> annual, 65 ug/m<sup>3</sup> daily / 2° same
- '06 standard – 15 ug/m<sup>3</sup> annual, 35 ug/m<sup>3</sup> daily / 2° same
- '11 standard – 11-13 ug/m<sup>3</sup> annual, 30-35 ug/m<sup>3</sup> daily / 2°: urban visibility

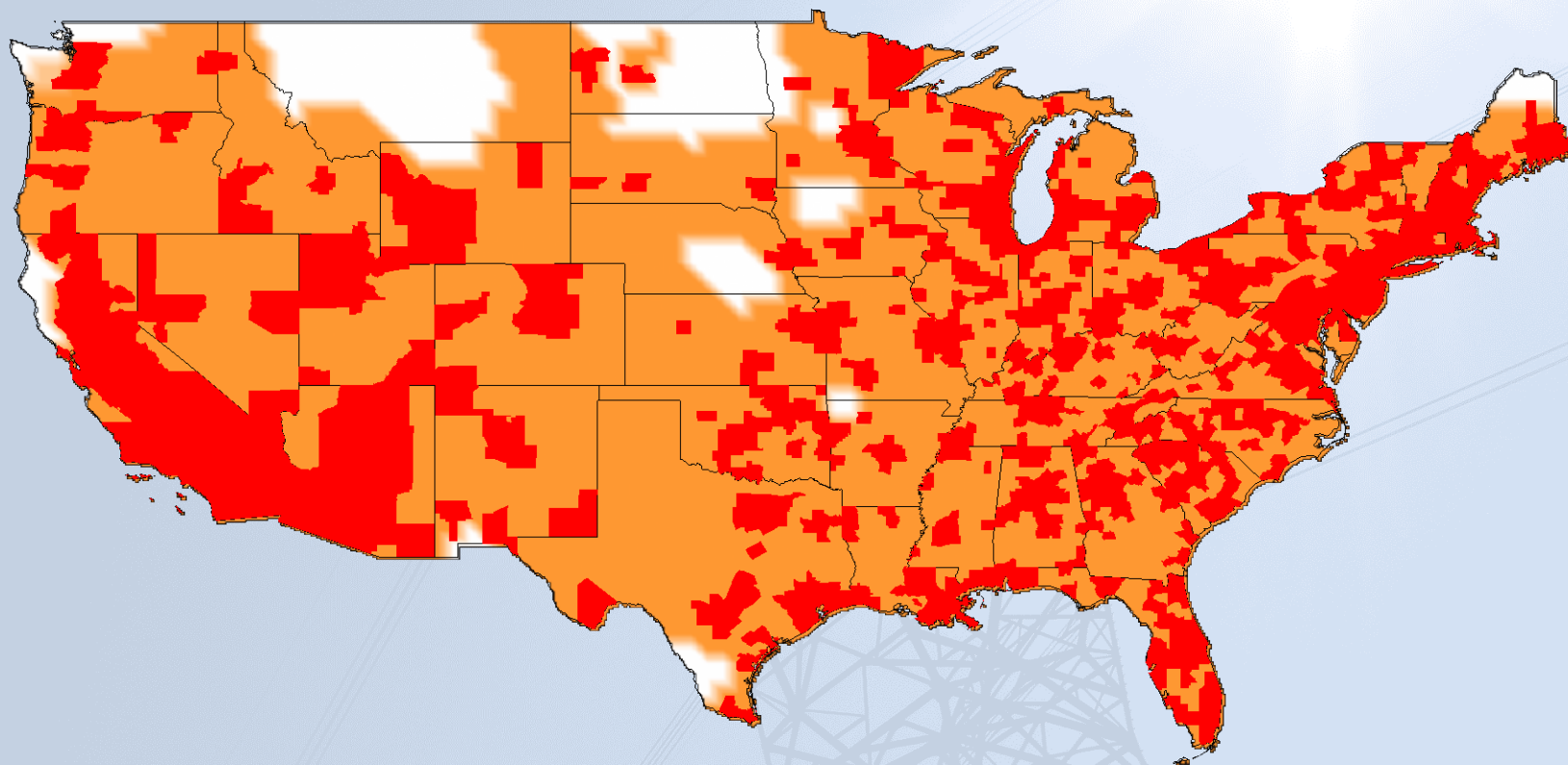
# Not Attaining the Current 75 ppb Standard

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■ Monitored MSAs and Non-Urban Counties Exceeding 75 ppb  
( 682 Counties; Based on 2006-2008 Data)

# Not Attaining the Proposed 60 ppb Standard



■ Monitored MSAs and Non-Urban Counties Exceeding 60 ppb  
(1108 Counties; Based on 2006-2008 Data)

■ Unmonitored Areas Projected to Exceed 60 ppb

Source: API

# Ozone Standard Reconsideration - Issues

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- Accelerated implementation schedule for designations and SIPs:
  - Final designations by Aug. '11; SIPs due to EPA Dec. '13
- Hugely expensive: Total annual cost of \$20-90 Billion in 2020, according to EPA's Regulatory Impact Analysis (RIA).
- The bulk of the benefits are from reductions in fine particulate matter (controlled through a different NAAQS).
- Needed controls largely unknown at present:
  - EPA RIA: "The annual control technology costs of implementing known controls ... in the proposed range of 60 or 70 ppb in 2020 would be approximately \$3.3 to 4.5 billion." (*out of \$20-90 billion total cost*).

# Ozone Standard Reconsideration - Issues

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- Ability to Attain:
  - Harvard University researchers (Wang et al, 2009) found “exceedances of the 75 ppb U.S. air quality standard in eastern Michigan, western New York, New Jersey, and southern California are often associated with Canadian and Mexican pollution enhancements in excess of 0.010 ppm.”  
*(one-sixth to one-seventh of proposed standard)*
- Expanded Monitoring = Expanded Non-Attainment:
  - EPA proposed in July ‘09 to add 270 ozone monitors to the network.
    - Small cities of 50-350K population.
    - Non-urban areas near Class I areas.
    - Increase length of ozone season in half the states.

# PM<sub>2.5</sub> -2006 Standard Remand

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- Feb. 2009 remand to EPA of its 2006 decisions regarding primary PM<sub>2.5</sub> and secondary NAAQS.
- Current schedule: **February 2011 proposal and an October 2011 final rule.**
- Policy Assessment (2<sup>nd</sup> Draft, June '10) - **EPA staff recommends major tightening of the PM NAAQS:**
  - Annual: within the range of 11 to 13 ug/m<sup>3</sup> (vs. 15 ug/m<sup>3</sup> now).
  - 24-hour: 30 ug/m<sup>3</sup> if 11 ug annual (vs. 35 ug/m<sup>3</sup> now).
  - A secondary standard, to address daytime visibility impairment.
- Uncertainties remain including understanding the relative toxicity of the different components in the fine particle mixture.

# CAIR Replacement “Transport Rule”

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- **Supports compliance with several NAAQS:** 1997 ozone and annual  $PM_{2.5}$  and 2006 daily  $PM_{2.5}$ .
- Proposal affects power companies in 31 eastern states through state emission budgets.
- New reductions in 2012 (for  $NO_x$  and  $SO_2$ ).
- New reductions in 2014 (further reductions for  $SO_2$  in about half the states affected by the rule).
- Variable impacts and opinions.
- **Key: Provides little long-term certainty** because requirements will be superseded by new Transport Rules addressing the 2011 ozone standards and the 2011 particulate matter standards.



# Power Generation Sector SO<sub>2</sub> and NO<sub>x</sub> Emissions Down

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- EPA's Clean Air Markets Division:
  - National SO<sub>2</sub> emissions in 2009 were 67% below in 1980.
  - National NO<sub>x</sub> emissions in 2009 were 72% below in 1980.
  - NO<sub>x</sub> emissions during the ozone season in the 20-state Eastern region declined 81 percent since 1990.
  - With Transport Rule, SO<sub>2</sub> emissions in Eastern states down 80-90 percent (comparing 1990 actual and 2014 “budgets”).
- NO<sub>x</sub> from fossil-fuel based electric generating units only approximately 12 percent of the national total emissions.
- Due to “co-benefit” SO<sub>2</sub> and NO<sub>x</sub> controls, mercury estimated to be cut by half before MACT rule.

# Other CAA Drivers: 2010 SO<sub>2</sub> and NO<sub>2</sub> NAAQS

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- **June 1-hour primary SO<sub>2</sub> NAAQS** at 75 ppb.
  - Meet standard no later than August 2017 (some controls by 2014?).
  - Both monitoring data and modeling results for “attainment.”
- **January 1-hour NO<sub>2</sub> NAAQS** at 100 ppb.
  - Focus on air quality near major roadways.
  - After an area is designated non-attainment, options to reduce NO<sub>x</sub> emissions near highways may be limited and regulators may look again to stationary sources.
- For both NAAQS, **modeling of new source impacts required in PSD permits problematic** due to conservatism of models; legal challenges.
- July 2011 proposed **joint SO<sub>x</sub>-NO<sub>x</sub> secondary standard** related to acidification.

# Other CAA Drivers: Regional Haze / Hazardous Air Pollutants

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## ■ Regional Haze

- SIPs due January 2011 / FIPs.
- Best Available Retrofit Technology (BART) limits a key issue, especially **push for SCR in western U.S.**
- **Relationship to Transport Rule(s)?**
- Interim progress reports for the current reasonable progress planning period due in 2012-13.

## ■ Hazardous Air Pollutants

- All HAPs for coal and oil units.
- November 2011 final decision and 3-year compliance period.
- Implications: Various combinations of **FGD**, baghouses, carbon injection.

# Summary – NAAQS Issues

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- Ozone – Stringency of '11 std.; expanded monitoring; cost; attainability.
- PM – Stringency of '11 std.; cost; attainability.
- SO<sub>2</sub> – Modeling for designations and new sources; trading?
- NO<sub>2</sub> – Modeling for new sources.
- Stringent new secondary standards.
- Transport Rule impacts and TR II and TR III uncertainty.
- Tight ozone and PM standards would increase non-attainment areas in the west and perhaps importance of transport.
- Congressional oversight.