

# Clean Air Programs Impacting Coal Production and Jobs in Virginia and the Eastern United States

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Eugene M. Trisko  
Attorney-at-Law  
emtrisko@earthlink.net

# Topics

- Clean Air Act programs affecting coal generation and coal-related labor (mines, rails, generating plants) in the near-term
- The good news about Virginia coal-related emissions and air quality
- Preliminary assessment of “units at risk” of premature retirement circa 2013-2015
- Comparative impact analyses

# EPA CAA Agenda Highlights

- 63 air rules in pipeline, most driven by litigation and statutory requirements
- Every national ambient air quality standard is under review/revision (5 year cycles)
- CAIR replacement transport rule proposed May 2010 (SO<sub>2</sub>/NO<sub>x</sub>) in response to DC Circuit remand
- Multiple MACT mercury plus other hazardous air pollutants proposal early 2011, final rule late 2011
- Revised ozone standards proposed January 7, 2010 (60-70 ppb), compliance 2014-2031
- New PM standards in 2011
- Proposed 1-hour SO<sub>2</sub> standard may independently require scrubbers at many units

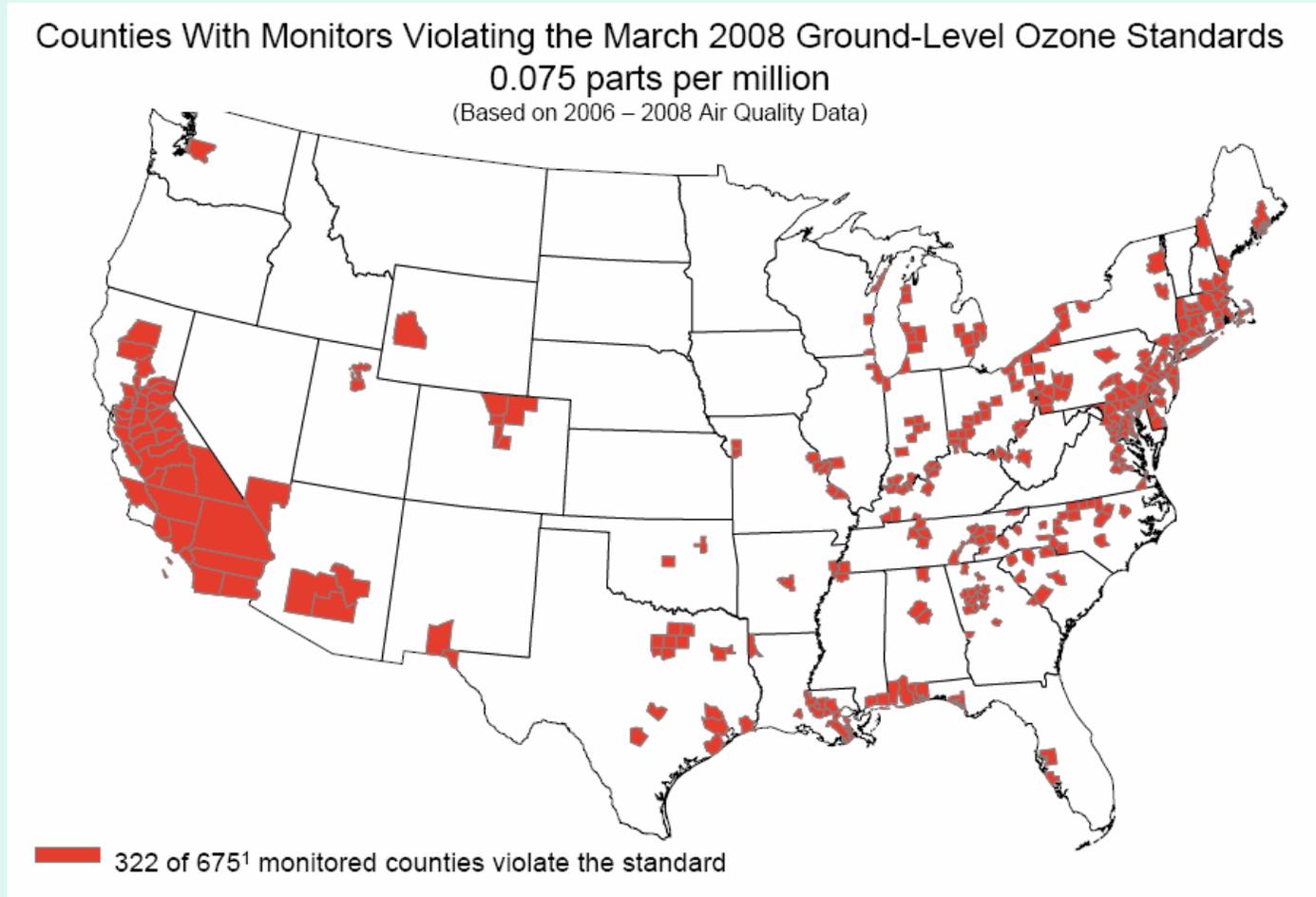
# Transport Rule Outlook

- Geographic limits on trading due to court's concerns
- More restrictive SO<sub>2</sub>/NO<sub>x</sub> caps in many states, less restrictive in others
- Unit or plant-specific control option
- Rule to be updated with each new NAAQS revision
- Early 2011 final rule
- Implementation proposed for 2012, 2014

# Further revised ozone standard

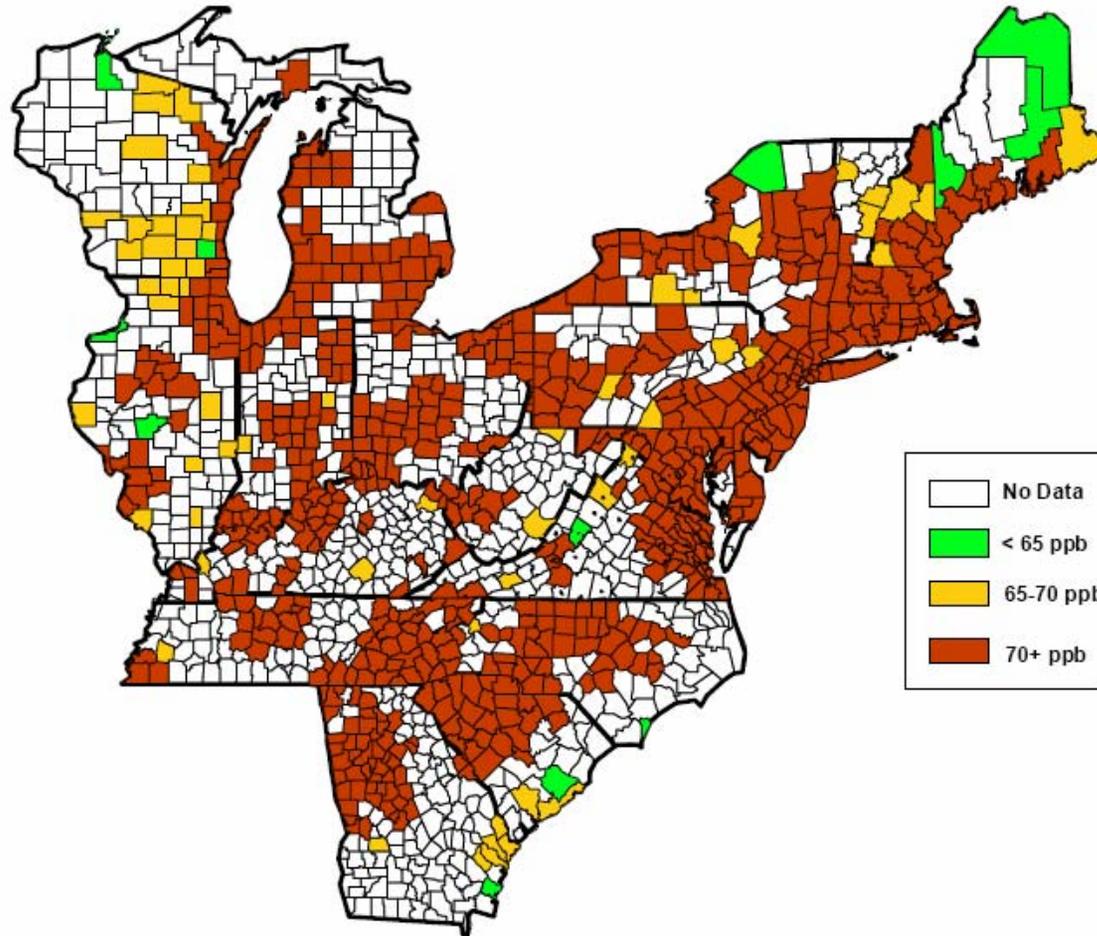
- EPA announced reconsideration and stay of 2008 75 ppb 8-hour ozone standard on September 16, 2009.
- New primary standard of 60-70 ppb and secondary standard proposed January 15, 2010.
- CASAC recommended a primary standard of 60-70 ppb.
- Revised standard expected within weeks.

# Current ozone nonattainment @ 75 ppb



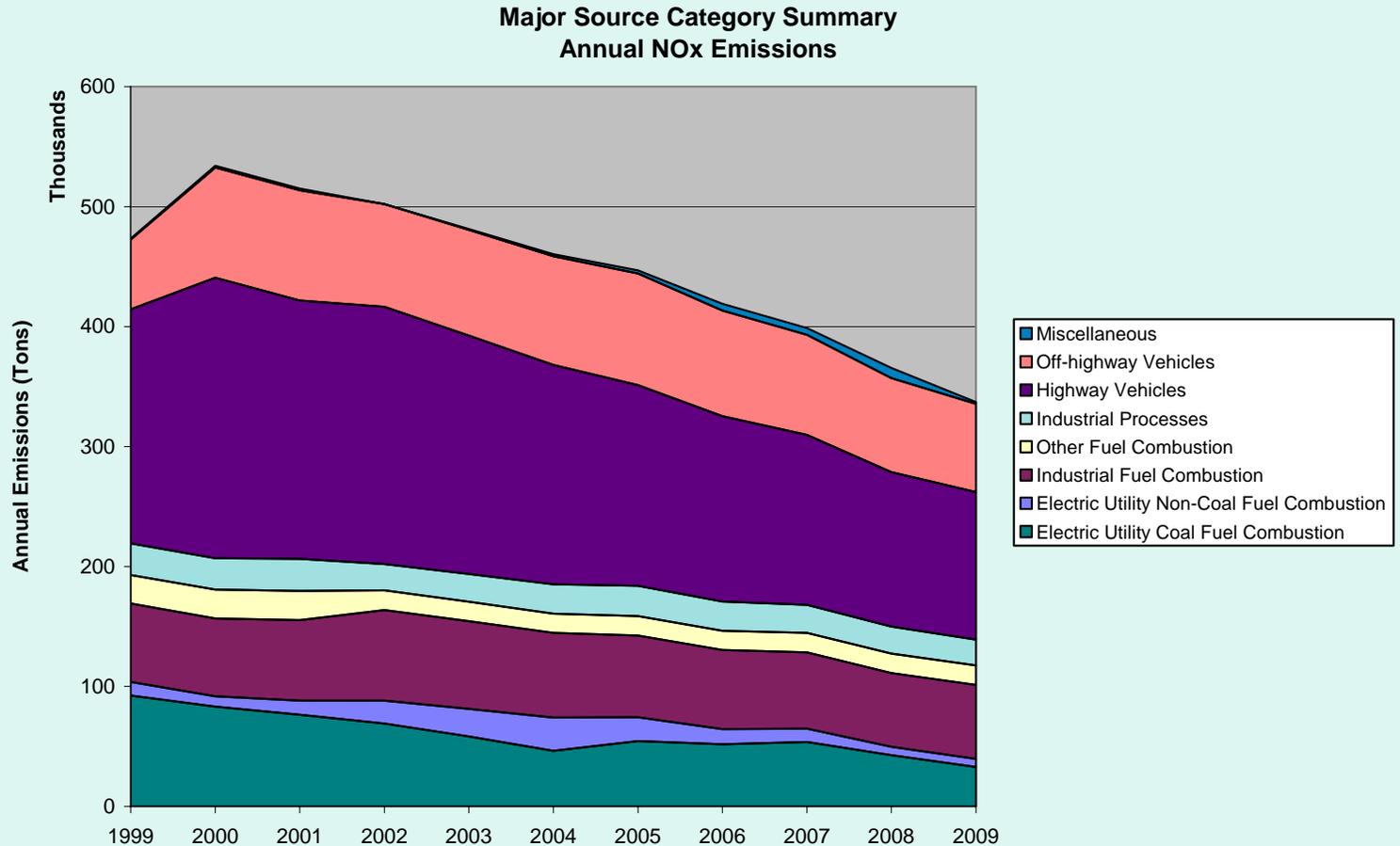
Source: US EPA.

## Potential Nonattainment By CSA (2007-2009 DV)



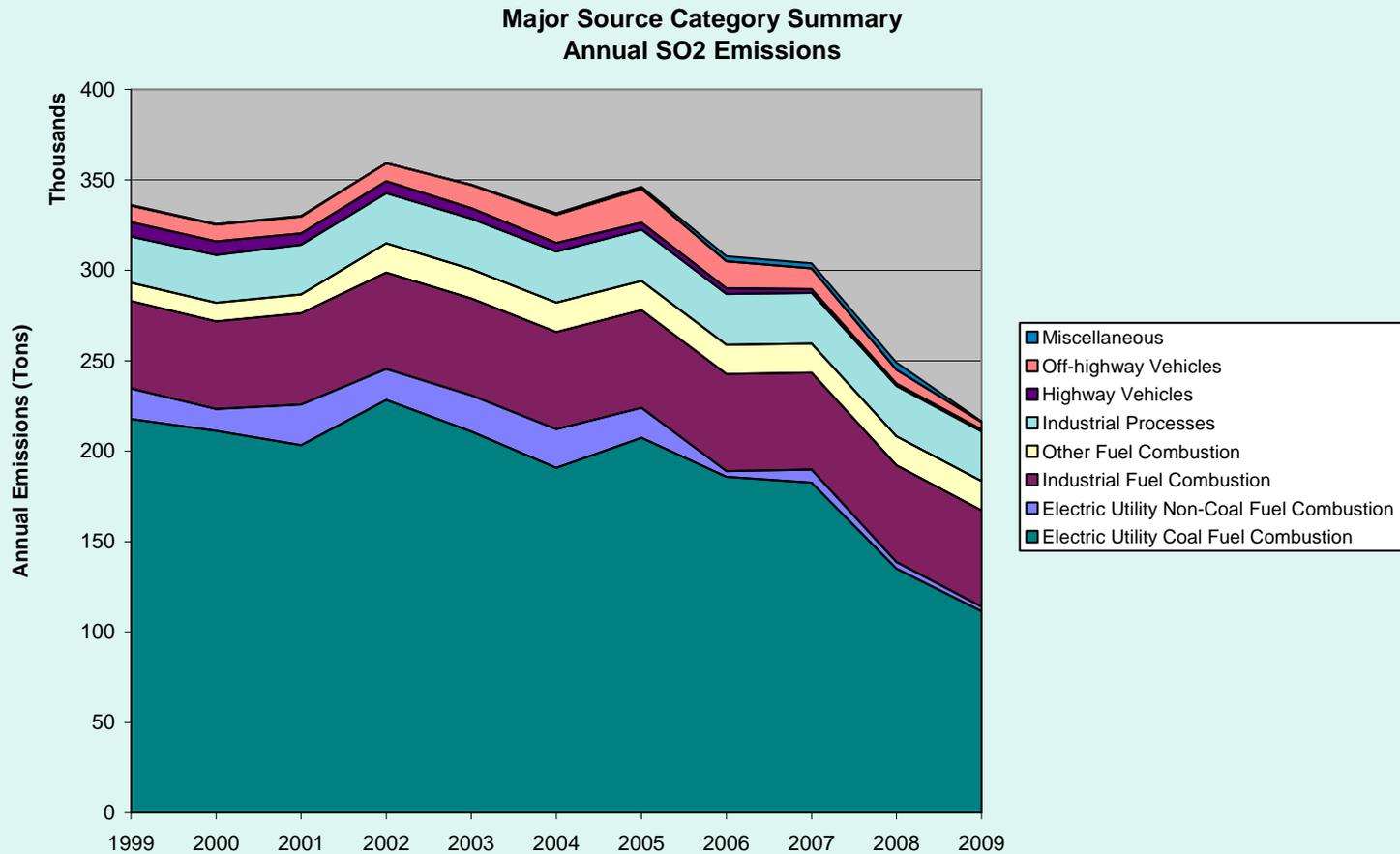
Source: Ozone Transport Commission (June 2010).

# Good news: Virginia coal NOx emissions reduced by 65% since 1999 (versus 20% for other sectors)



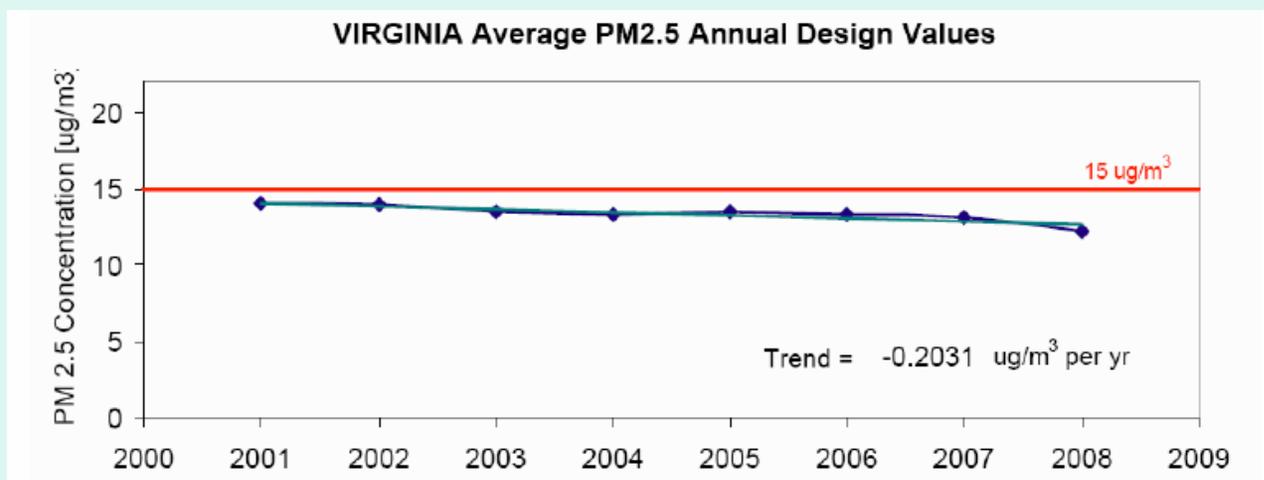
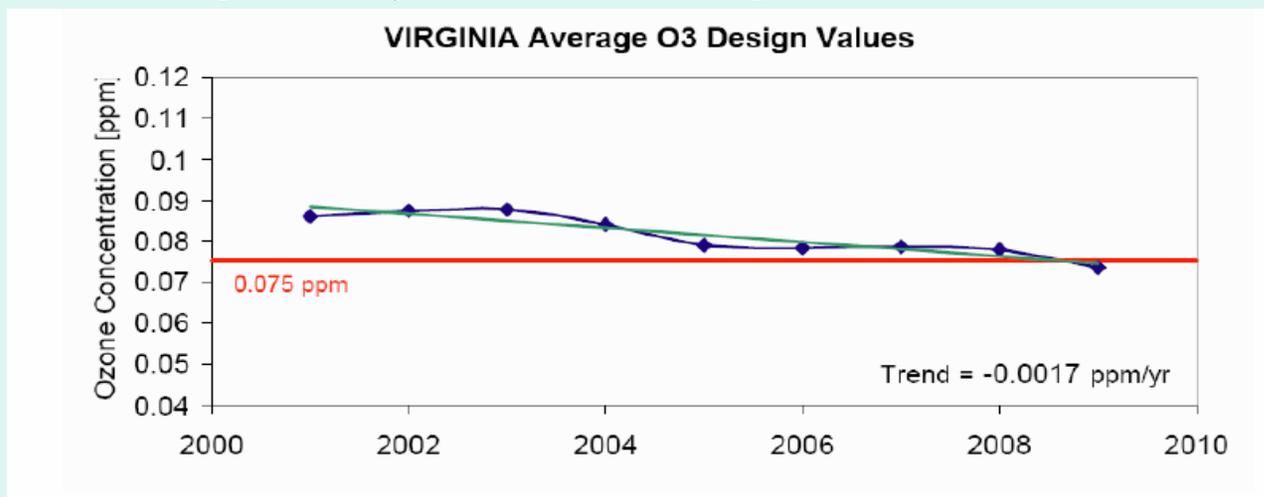
Source: Alpine Geophysics/ENVIRON (July 2010).

# Virginia coal SO<sub>2</sub> emissions have declined by 49% – with more reductions in store



Source: Alpine Geophysics/ENVIRON (July 2010).

# Meanwhile, Virginia's ozone and PM air quality have improved



Source: Alpine Geophysics/ENVIRON (July 2010).

# Multiple MACT Standards

- Replacement for EPA mercury rule vacated by DC Circuit will cover all air toxics and acid gases (HCL) per separate decision of DC Circuit
- 63 air toxics emitted by coal units
- EPA believes controls for 4-5 toxics will cover all toxic emissions (e.g., PM, dioxin, acid gases, mercury, CO)
- Rule promulgated late 2011 would require compliance by late 2014-early 2015 (36 month statutory compliance, with 1-2 year extension possible.)
- Rule could require wet FGD/SCR, baghouses and some mercury-specific controls on all coal units >25 MW.

# Classification of coal combustion byproducts as hazardous waste

- Two previous EPA reviews of coal ash and CCBs declined to classify CCBs as hazardous waste under RCRA.
- Intense pressure from Congress (e.g., Rep. Boucher and Energy & Commerce Committee) to avoid Subtitle C hazardous waste classification.
- Many states prefer state option for non-hazardous waste treatment.
- Beneficial uses likely will be allowed.
- Costs potentially ~\$2-10 Bil./yr depending on stringency.

# “Units at risk” preliminary assessment

- Many older/smaller coal units not already scrubbed may be uneconomic to retrofit.
- Sorted DOE/NETL 2007 coal plant data base for units 25MW-400 MW, more than 40 years old, without scrubbers (or planned scrubbers) removing at least 50% SO<sub>2</sub>.
- Magnitude of affected generation in several states raises issues about adequacy (reserve margins) and reliability.

# “Units at risk” preliminary findings

- 433 coal units in U.S. (56 GW, 18% of total coal capacity) are >25 MW and <400 MW and older than 40 years (as of 2010), without existing or planned scrubbers removing >50% SO<sub>2</sub>.
- Average unit is 52 years old, 135 MW.
- Total generation “at risk” 318 million MWh, 15% of US coal generation (2005).
- Total coal burn “at risk” 134 million tons, 13% of US coal burn (2005).

# Summary of SE coal “units at risk”

**Southeast Coal-Based Units 25-400 MW  
and >40 Years of Age, w/o installed or planned scrubbers**

<b>State</b>	<b>No. of units</b>	<b>GWH generation (2005)</b>	<b>Pct. of total state GWH generation (2009)</b>
<b>VA</b>	<b>21</b>	<b>14,322</b>	<b>21%</b>
<b>NC*</b>	<b>22</b>	<b>9,798</b>	<b>9%</b>
<b>SC</b>	<b>14</b>	<b>10,266</b>	<b>11%</b>
<b>TN</b>	<b>17</b>	<b>20,251</b>	<b>27%</b>
<b>GA</b>	<b>10</b>	<b>7,891</b>	<b>6%</b>
<b>AL</b>	<b>19</b>	<b>20,105</b>	<b>15%</b>
<b>Total</b>	<b>103</b>	<b>82,633</b>	<b>14%</b>

\*Includes Progress Energy announced retirements.

# Potential job impacts

- Stringency of rules and standards will determine extent of unit retirements.
- Gas/renewables likely replacement fuels with smaller labor inputs per MWh.
- Analysis of preliminary screening results suggests potential loss of 54,000 direct jobs and 250,000 total jobs at older, smaller unscrubbed units.
- Potential job losses in VA estimated at 2,400 direct jobs, 11,500 total jobs.

# Comparative analyses

- Credit Suisse (August 2010) projects loss of 60 GW of coal generating capacity and 157-324 million tons of coal displacement (of ~900 million tons), all related to MACT.
- Eastern ISOs projected to quickly revert to 15% reserve margins.
- Similar findings in EEI analysis of “train wreck” scenarios.

# Thanks to ...

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- Views expressed are mine, along with errors and omissions.

# Questions?

