



Edison Electric Institute

Power by AssociationSM

NAAQS Issues

Impact of Ambient Air Quality Rules on Fossil Fueled Power Plants

McIlvaine Company

December 5, 2011

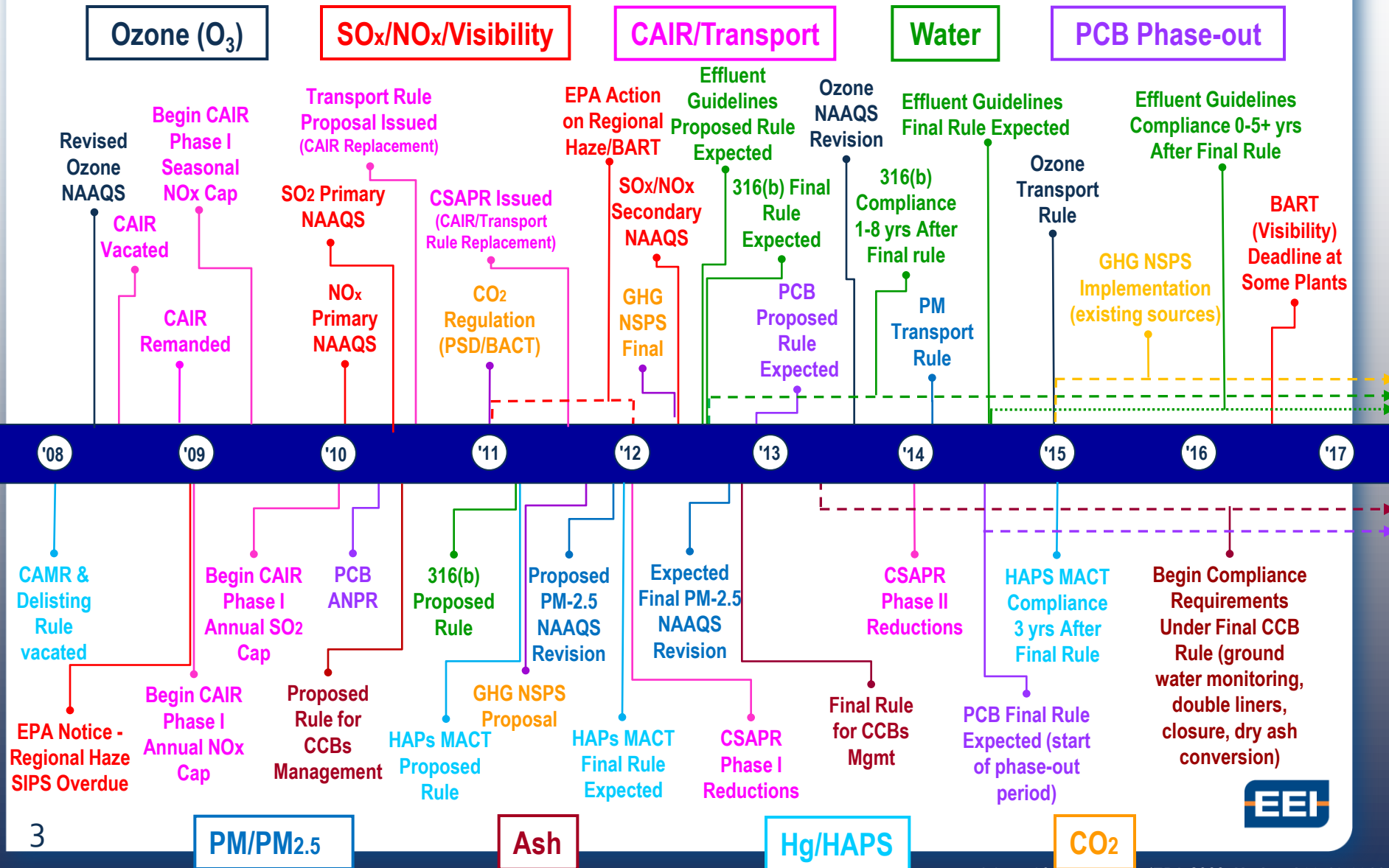
John Kinsman

Edison Electric Institute

Outline/Summary

- This presentation:
 - Identify some problems but not fixes
 - NAAQS compliance obligations after CSAPR/MACT?
- Utility emissions plummeting
 - CSAPR and MACT – new controls
- MACT update
- CSAPR update
 - Impacts on Ozone & PM (with other Fed/state programs)
- Regional haze update
- NAAQS uncertainties, including new Transport Rules

Possible Timeline for Environmental Regulatory Requirements for the Utility Industry



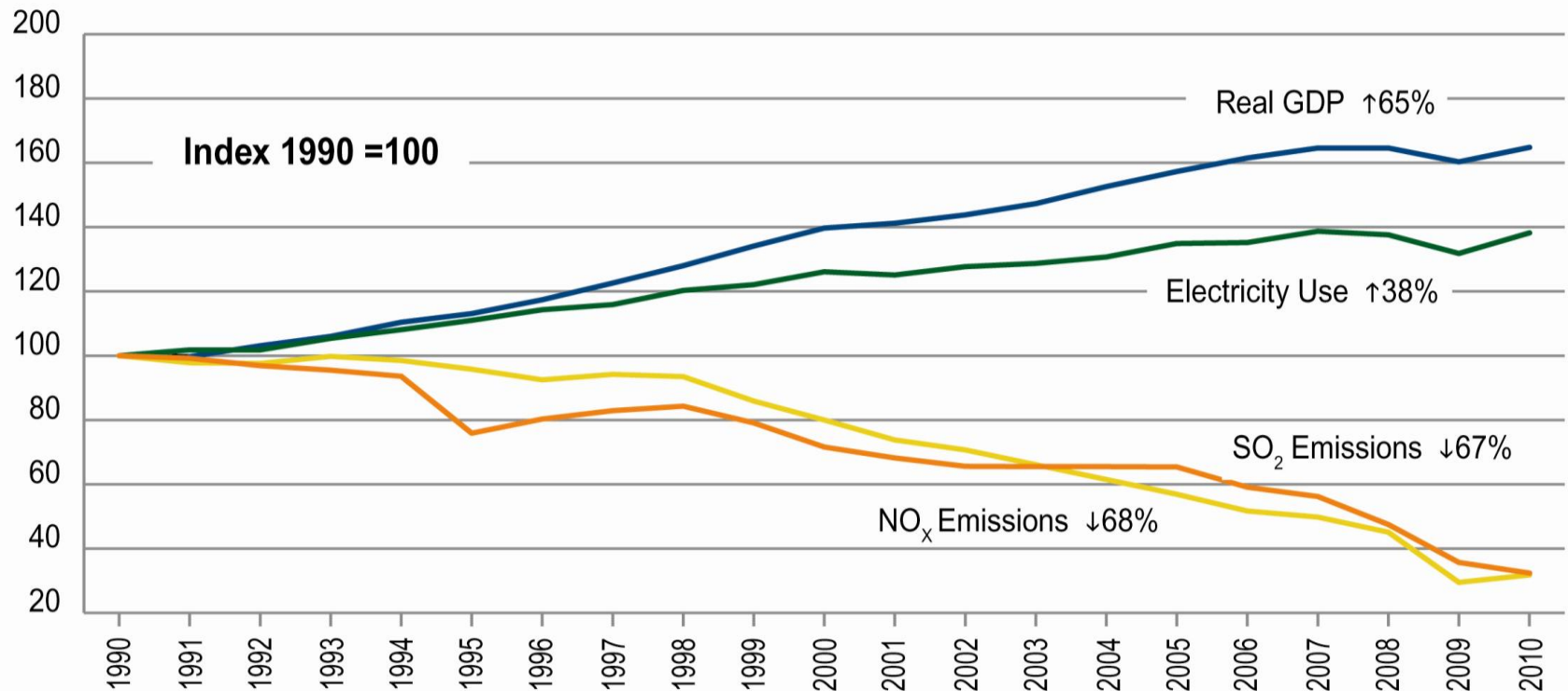


Anticipated NAAQS Implementation Milestones

(October, 2011)

Pollutant	NAAQS Promulgation Date	Designations Effective	110(a) SIPs due (3 yrs after NAAQS promulgation)	Attainment Demonstration Due	Attainment Date
PM _{2.5} (2006)	Sept 2006	Dec 2009	Sept 2009	Dec 2012	Dec 2014/2019
Pb	Oct 2008	Dec 2010/2011	Oct 2011	June 2012/2013	Dec 2015/2016
NO ₂ (primary)	Jan 2010	Feb 2012	Jan 2013	Aug 2013	Feb 2017
SO ₂ (primary)	June 2010	July 2012	June 2013	Jan 2014	July 2017
Ozone (2008)	Mar 2008	2012	Mar 2011	2015	2015-2032
Ozone (current review)	July 2014	2016	July 2017	2019/2020	2019-2036
PM _{2.5} (current review)	TBD	TBD	TBD	TBD	TBD
NO ₂ /SO ₂ Secondary	Mar 2012	TBD	Mar 2015	TBD	TBD

Power Plants Reduce Emissions Despite Increasing Electricity Demand



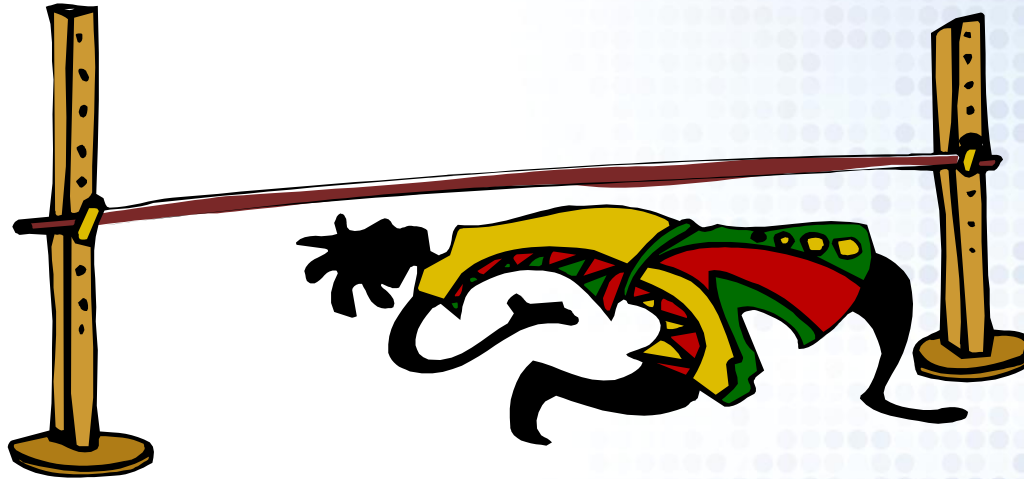
1990 represents the base year. Graph depicts increases or decreases from the base year.

Sources: U.S. Department of Energy, Energy Information Administration (EIA), U.S. Environmental Protection Agency (EPA), and U.S. Bureau of Economic Analysis.

EGU Emissions

Emission	Year	SO2 (million tons /yr)	NOx	PM2.5	Source
EGU	1990	15.7	6.7		CAMD
	2005	10.4		0.51	MACT RIA - base case
	2008		3		CAMD
	2010	5.1	2		CAMD
	2016	3.6		0.38	MACT RIA - base case
	2016	1.2		0.29	MACT RIA - control case
(92% reduction)					
Non-EGU Point	2016	1.4		0.41	MACT RIA - control case (incl. 2011 boiler MACT)
National Man-made	2016	3.9		3.8	MACT RIA - control case (utilities: 8% of total)

How Low Can You Go?



- Limbo:
 - A West Indian dance in which the dancers keep bending over backward and passing under a pole that is lowered slightly each time
 - A region on the border of hell or heaven

Some Key Dates – EGU Emission Regulation

- 2012 – CSAPR SO₂, NO_x and ozone-season NO_x
- 2014 – CSAPR SO₂ (16 Group 1 states)
- 2014/15 – controls related to 2006 PM_{2.5} NAAQS
- 2015-16 – Utility MACT controls – SO₂ and PM_{2.5}
- 2015 + - Utility NO_x controls related to 2008 ozone NAAQS
- 2016? – Utility SO₂ controls to meet 2010 1-hr SO₂ NAAQS in 2017 (compliance based on modeling 2017 concentrations)
- 2016-7 – BART (5 yrs after 2012 settlement agreement dates)
- Meeting 2013 (PM) and 2014 (ozone) NAAQS
 - 2019+ – deadline to meet 2014 ozone NAAQS
 - 2020? – controls to meet 2013 PM_{2.5} NAAQS
 - When new Transport Rule controls needed?
 - When local controls needed?

Cross-State Air Pollution Rule (proposed as Transport Rule, replaces CAIR)

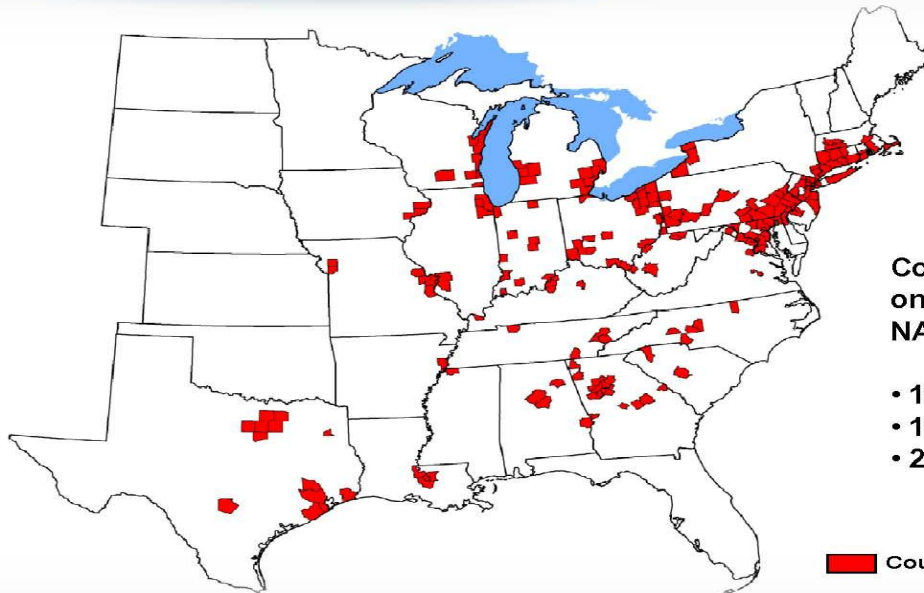
- Final rule in Federal Register August 8, 2011
- Supplemental proposal (July 11) to add NO_x ozone season requirements for IA, KS, MI, MO, OK, WI (OK = 28th state)
- Revision proposal:
 - Modified state budgets
 - Trading variability assurance provisions pushed to 2014

Cross-State Air Pollution Rule

- Numerous legal challenges filed:
 - Challenging final rule: states, power entities; coal companies; UMWA; IBEW; customers
 - States, environmental groups and three electric generators intervening to support EPA
 - Issues: imposition of FIP, notice and comment, inclusion of Texas for PM, models/data, time to comply, reliability, electricity price impact
 - Requests for stay

Cross-State Air Pollution Rule

Counties Violating Air Quality Standards in the Cross-State Air Pollution Rule Region (based on 2003-07 air quality monitoring data)



Counties in red are violating one or more of the following NAAQS:

- 1997 $PM_{2.5}$
- 1997 ozone
- 2006 $PM_{2.5}$

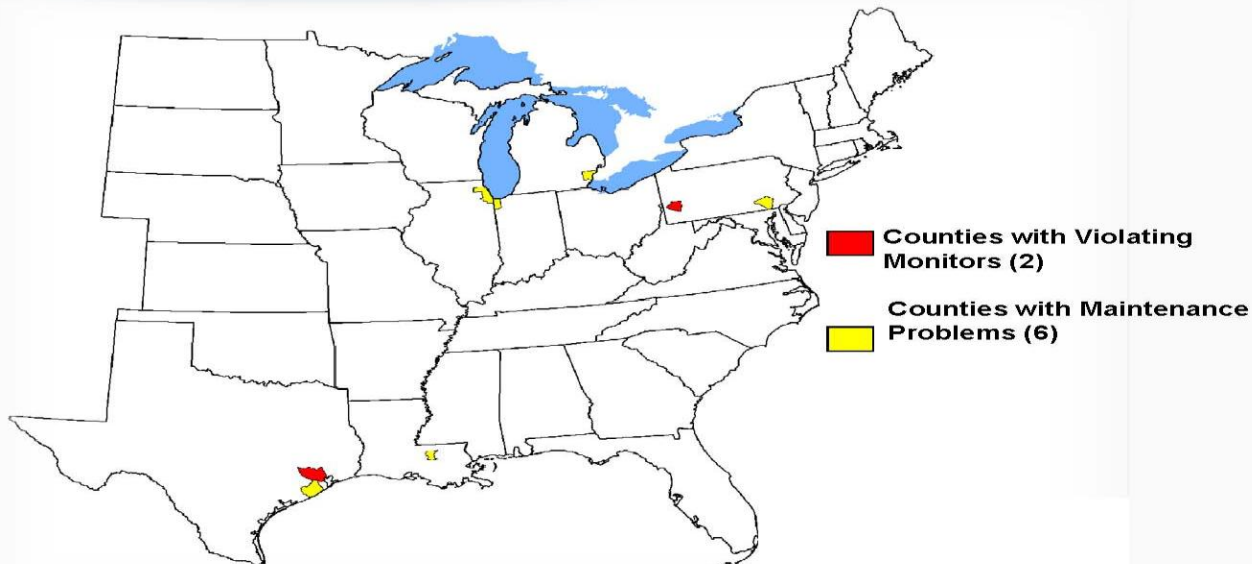
 Counties with Violating Monitors (207)

The counties in red have at least one ozone and/or $PM_{2.5}$ monitor which violated the NAAQS in the periods 2003-2005, 2004-2006, and/or 2005-2007.

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Cross-State Air Pollution Rule

Counties with Monitors Projected to Have Ozone and PM_{2.5} Air Quality Problems in 2014 with the Cross-State Air Pollution Rule



This analysis assumes that the Clean Air Interstate Rule is not in effect. It does reflect other federal and state requirements to reduce emissions contributing to ozone and fine particle pollution that were in place as of February 2009.

Final 2014

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Visibility / Regional Haze

- Concern is regional visibility degradation from emission sources, as affects visual air quality in 156 Class I areas
- Compliance through SIPs:
 - Long-term goal: no degradation by 2064
 - Reasonable progress/Best Available Retrofit Technology
- SIPs – consent decree requiring EPA to act from December 2011 through November 2012
 - BART limits for 1962-77 plants, considering cost, impact on visibility
 - BART: for large electric plants, SO₂ scrubber and NO_x controls by ~ 2017 (EPA FIPs for some western plants)

Utility MACT Issues

- EPA projects the installation of:
 - 81 GW of dry scrubbing controls, such as DSI, to address acid gases
 - 93 GW of activated carbon injection (ACI) to address mercury
 - 166 GW of fabric filters (baghouses) to address non-mercury metals
- Some plants will close or re-power
- Some plants will need more than 3 or even 4 years
- Litigation

National Ambient Air Quality Standards (NAAQS)

- NAAQS continually ratcheted down over time
 - **Ozone** – 1997, 2008, 2014
 - President halted reconsideration of 2008 rule in Sept. 2011
 - **PM 2.5** – 1997, 2006, 2012
- New 1-hour **NO₂** and **SO₂** standards in 2010

NAAQS - Uncertainties

- Litigation
- 5-year reviews to reevaluate standard levels
- Designations – especially given new approach to using modeling for 1-hour SO₂ NAAQS
- State implementation plans (SIPs) to apportion necessary actions
- Regional EPA “transport rules” to address new PM and ozone NAAQS (following CSAPR and previous transport rules)

NAAQS - Uncertainties

- Cost/benefit
- Attainability/background levels
- Implementation
 - Modeling – designations
 - Modeling – new sources
 - Offsets in non-attainment areas
- Primary (health) vs. "secondary"
(environment/welfare) standards