



RAP

Energy solutions
for a changing world

Examples of Responding Strategically: Pro-Active State (and Utility) Actions

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Preliminary Thought:

Strategic Response?

Most state and utility actions preceded regulatory requirements, often by years.

How about Strategic “Preresponse”?
(i.e., “Getting ahead of the problem.”)

State Leadership – MATS

- 17 states required Hg reductions (including Wisconsin)
- Positioned their utilities for MATS compliance in a less rushed, less traumatic way, potentially less expensive way
- Their EGUs got a “head start” and longer lead time to reduce Hg emissions than MATS provided
- Early enough to avoid “crunch time” on skilled labor or material shortages that make pollution control projects more expensive

“Mercury Falling”

CAP, June 2011

- Power plants in 17 states are already subject to state limits on mercury emissions – some more stringent than EPA has proposed.

State policies: Seventeen states have established mercury emission limits on coal plants

State	Year enacted	Year takes effect
Colorado	2007	*
Connecticut	2003	2008
Delaware	2006	2013
Georgia	2007	2018
Illinois	2006	2009
Maryland	2006	2008, 2012
Massachusetts	2007	2010, 2013
Michigan	2009	*
Minnesota	2006	2015
Montana	2006	2010
New Hampshire	2002	2018
New Jersey	2004	*
New York	2007	2007, 2012
North Carolina	2006	2010, 2015
Oregon	2010	2018
South Carolina	2008	2009
Wisconsin	2008	2015

*State policy does not specify the year the program would take effect.

Sources: Clean Energy Group, Environmental Defense Fund.

“Mercury Falling”

CAP, June 2011

- CAP found more than half of the 17 states’ total generation capacity has pollution controls that can reduce mercury.

Many power plants have pollution controls in states with mercury standards

State	Total units	Average age of units (years)	Percent of capacity with scrubbers	Percent of capacity with activated carbon injection technology
CO	20	40	94%	32%
CT	2	33	35%	65%
DE	8	40	0%	54%
GA	26	44	60%	29%
IL	54	48	24%	18%
MA	4	50	89%	100%
MD	16	44	81%	36%
MI	59	44	16%	2%
MN	25	44	77%	39%
MT	8	31	92%	5%
NC	40	47	89%	0%
NH	5	53	0%	0%
NJ	7	39	80%	69%
NY	23	52	45%	26%
OR*	1	31	0%	0%
SC	26	39	74%	0%
WI	29	50	32%	7%
All states	353	45	54%	16%

*The sole utility-owned coal-fired unit in OR is being retired, according to SourceWatch.

Sources: U.S. Energy Information Administration, U.S. Environmental Protection Agency, SourceWatch.

Wisconsin Power and Light Experience

- Acting on Wisconsin's mercury rule, Wisconsin Power and Light installed ACI at its 380 MW Edgewater Generating Station Unit 5,
 - Burns sub-bituminous Western coal plant
 - Had an ESP to capture fine particles
 - Operational in the first quarter of 2008
 - Total installed costs ~\$8/kW, or ~\$3.04 million.

Xcel Experience in Minnesota

- In response to 2006 Minnesota state mercury law, Xcel Energy installed ACI at 900 MW Sherburne County Unit 3 (Sherco 3).
 - Burns low-sulfur Western coal from MT and WY
 - Had dry scrubber to reduce SO₂ emissions
 - Should reduce mercury emissions by ~90%
 - Completed in December 2009 at \$3.1 million total capital cost or \$3.46/kW.

Utility Testimonials

- Edison International (SCE) CEO Theodore Craver, in Q1-2011 earnings call told investors that it “installed the necessary equipment back in 2009 and [is] already achieving these [mercury] limits.”
- PPL Generation CEO William Spence indicated that by Q4 2010, it had already equipped “96% of [its] competitive coal generation” with scrubbers.
- Gale Klappa, CEO of **Wisconsin** Energy, anticipates “very little impact on customer electric rates or our capital plan between now and 2015 as a result of all the new EPA regulations that have been proposed.”

Not Just Mercury

- We Energies' "Power the Future" initiative
 - 10+ year, ~\$6 billion effort
 - Generation capacity increased ~50%
 - NO_x, SO₂, and mercury reduced ~70%
 - Well-positioned for MATS and CSAPR compliance



State Multi-Pollutant Initiatives

North Carolina Clean Smokestacks Act 2002

Clean Smokestacks Act: In June 2002, the N.C. General Assembly enacted the Clean Smokestacks Bill, officially titled the Air Quality/Electric Utilities Bill (SB 1078), which requires significant actual emissions reductions from coal-fired power plants in North Carolina. Under the act, power plants must reduce their nitrogen oxide emissions by 77% in 2009 and sulfur dioxide emissions by 73% in 2013.

Duke and Progress Energy NOx Emissions



6/01/2011 Note: Final NOx reduction goal in Clean Smokestacks Act was 56,000 tons in 2009

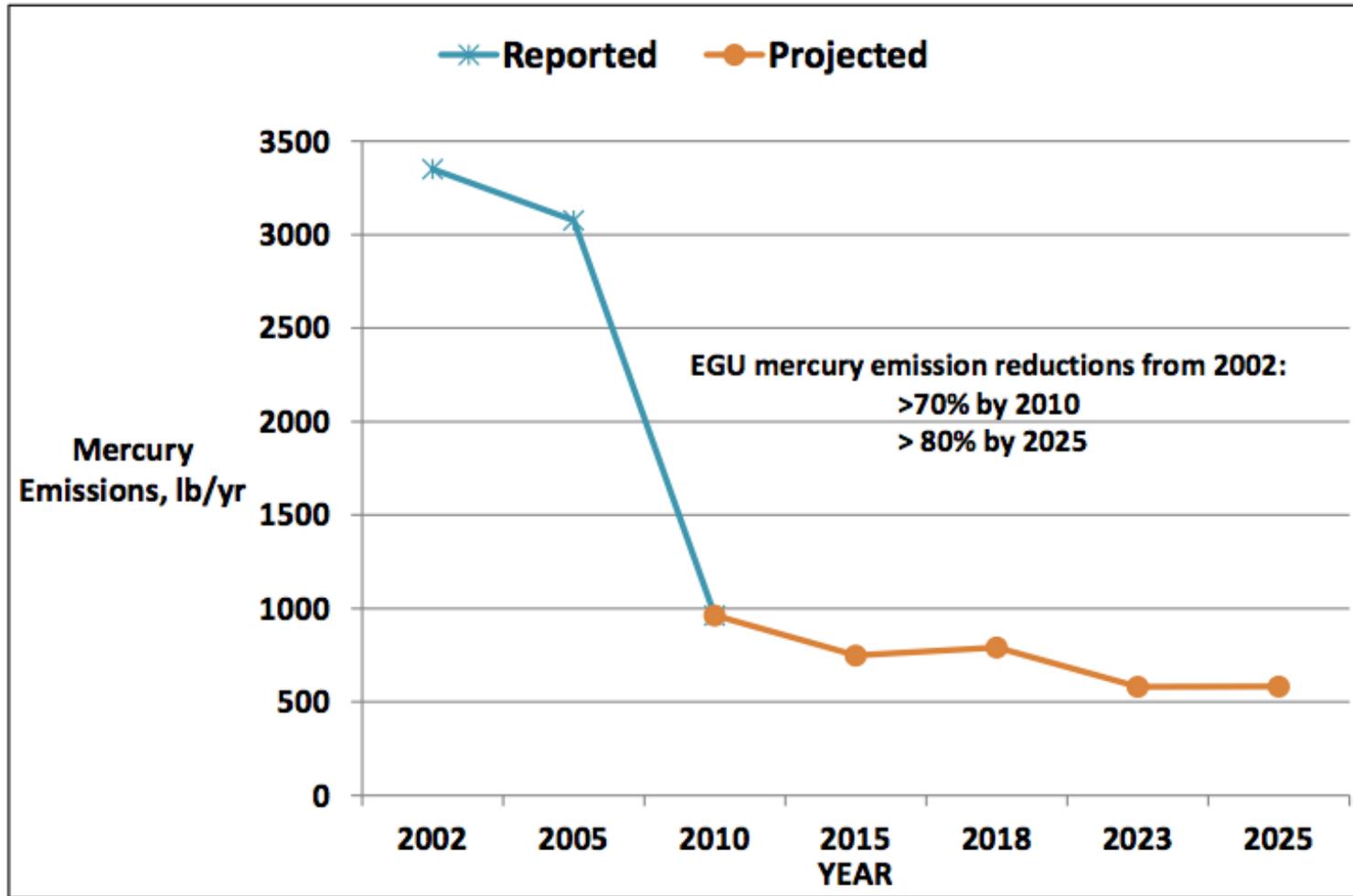
Duke and Progress Energy SO2 Emissions



6/01/2011 Note: Final SO2 reduction goal in Clean Smokestacks Act is 130,000 tons in 2013

NC CSA Mercury Co-Benefits

Figure ES. North Carolina EGU Mercury Emission Trend from 2002-2025



New Hampshire Clean Power Act 2002

- First “4-Pollutant” legislation
 - Capped annual SO₂ at ~80% reduction;
 - Capped annual NO_x at ~80% reduction;
 - Included mercury reductions TBD by DES after testing; SCR for NO_x,
 - Historical cap on CO₂
- Followed by 2006 legislation reducing mercury 80% (and SO₂ > 90%) with wet scrubber
- Essentially MATS- and CSAPR-compliant today

Minnesota Next Generation Energy Initiative 2006

- Calls for reducing GHGs below 2005 levels by:
 - 15% by 2015;
 - 30% by 2025; and
 - 80% by 2050
- Principally targets EE (1.5% per year, decoupling), so NO_x, SO₂, and Hg will also be reduced
- Repeal/reforms attempts made; vetoed in 2011

Minnesota Power Sector Regulations Project



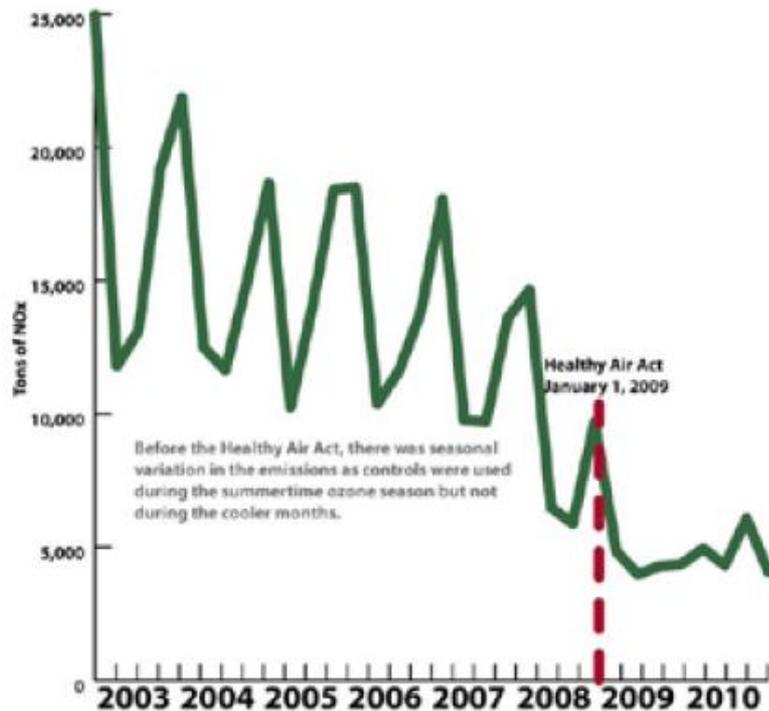
- Collaboration among PUC, PCA, Dept. of Commerce, and EPA
- Develop coordinated, cost effective plan to meet CSAPR, MATS, GHG NSPS, NAAQS, and CCR
- Explore cost reductions through efficiency, renewables, and CHP
- **Examine reliability issues and employment impacts**

Maryland Healthy Air Act 2006

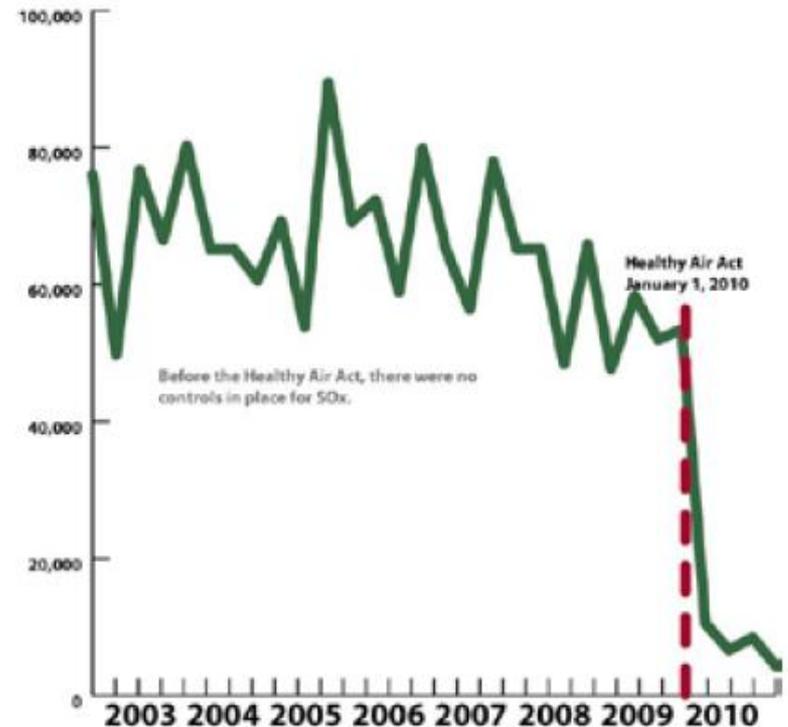
- Developed with the purpose of bringing Maryland into attainment of NAAQS for ozone and fine particulate matter by 2010.
- Compared to 2002 baseline, required:
 - NO_x reductions: 70% in 2009; 75% by 2012
 - SO₂ reductions: 80% in 2010; 85% by 2013
 - Mercury reductions: 80% in 2010; 90% by 2013
- Co-benefit: Reduced nitrogen deposition to the Chesapeake Bay

Maryland Healthy Air Act 2006

NOx Emissions from Power Plants - First Phase



SOx Emissions from Power Plants - First Phase



Maryland Greenhouse Gas Reduction Act (GGRA) 2009

- GGRA requires a plan by December 2012 that:
 - Reduces GHG emissions by 25% in 2020
 - **Has net economic benefit to Maryland**, and
 - **Creates new jobs**
- Current analyses show that economic benefits could be up to \$6.1 billion by 2020
- Current job creation estimates project as many as 36,000 new jobs from implementing the GGRA
- Also, EmPOWER Maryland Energy Efficiency Act of 2008

Florida-Tampa Electric Agreement 2010

- Settlement with EPA and Florida DEP
- \$1.2 billion invested in emissions controls, monitoring, and repowering
- Culbreath Bayside Power Station now emits:
 - 99% less NO_x; 99% less SO₂; ~50% less CO₂; no Hg
- Big Bend Power Station emissions reduced 87% less
- Polk Power Station IGCC uses 15% less fuel, is 12% more efficient
- According to the company, these early activities enable it to comply with MATS

Wisconsin Green Tier Program

- Regulated companies negotiate agreements with the DNR to perform better than regulatory requirements dictate and report on the results
- WI gives them recognition and some compliance flexibility in return
- Key difference: Green Tier is codified in state statutes



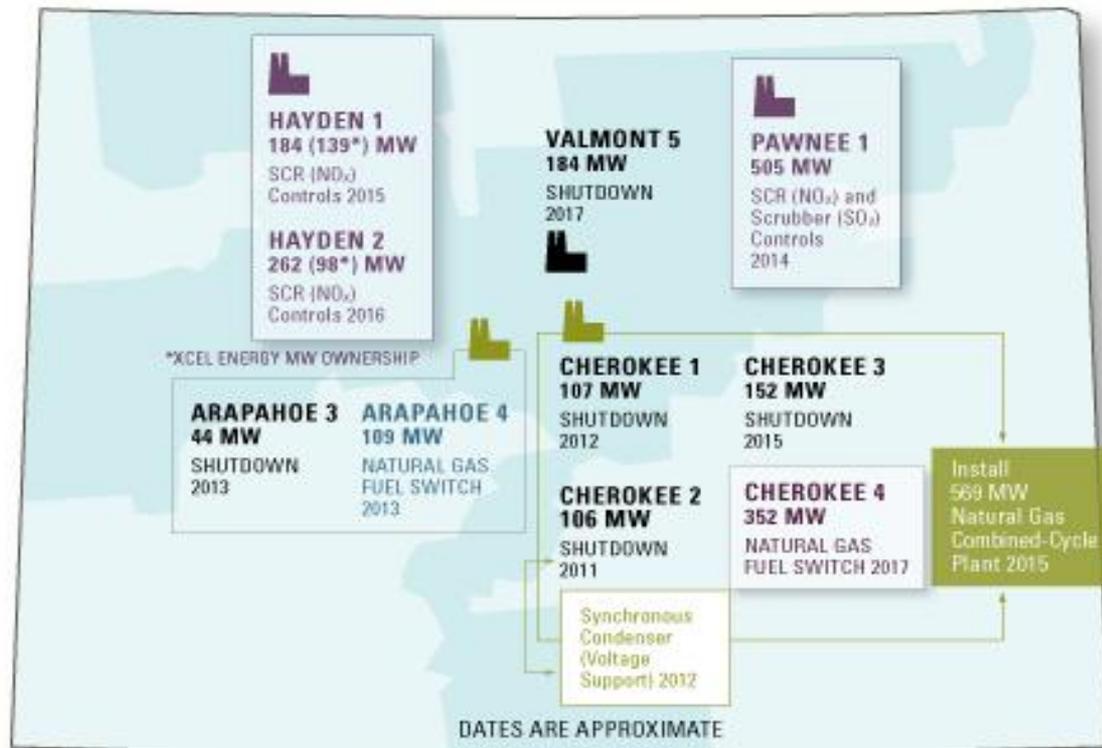
Colorado Clean Air-Clean Jobs Act 2010

- Focused on NO_x reductions from IOUs
- Required utilities to *proactively* develop a plan to reduce emissions *in advance* of final EPA rules
- Required DPHE approval of plans based on expected ability to meet standards
- Required PUC approval of plans based on costs
- Utility assured of cost recovery for approved plan



Colorado – Xcel's Approved Plan

- Approved in <1 year
- Retires 549 MW coal
- New 569 MW gas unit
- Retrofit 951 MW of coal with controls
- Rate impact ~2% per year over next 10 years
- NO_x, SO₂, and Hg reduced 82-86%, CO₂ by 28%



Colorado – Xcel’s Approved Plan

Table E¹⁰⁴

Xcel Energy’s Analysis Framework for Colorado’s Clean Air – Clean Jobs Act

1. Data Collection

- Identify Candidate Coal Units
- Emission Control Options and Costs
- Replacement Capacity Options
- Transmission Reliability Requirements

2. Scenario Development

- Meet NOx Reduction Targets
- Feasibility of Emission Controls
- Replace Retired Coal MW
- Transmission Needs Analysis

3. Dispatch Modeling of Scenarios

- Long-term Capacity Expansion Plan
- Cost of Transmission Fixes
- Coal and Gas Price Forecasts
- Customer Load Forecasts

4. Sensitivity Analysis

- Construction Costs
- Coal and Gas Prices
- Emissions Costs (NOx, SO₂, CO₂)
- Replacement MW for retirements
- Addition of renewable resources

Final Note

- Effectiveness of State-Utility leadership in reducing risks associated with eventual federal environmental regulations is clear
- Can rigorous collaboration and integration between PSC and DNR help drive similar forward-looking policy changes? For example:
 - Valuing externalities?
 - Adopting long-term, predictably more stringent regulations (e.g., linear vs. step function)?
 - Others?

About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raonline.org

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Additional Slides

Something is Working...

