



# Thoughts on Regulating CO<sub>2</sub> from Existing Sources Under Clear Air Act

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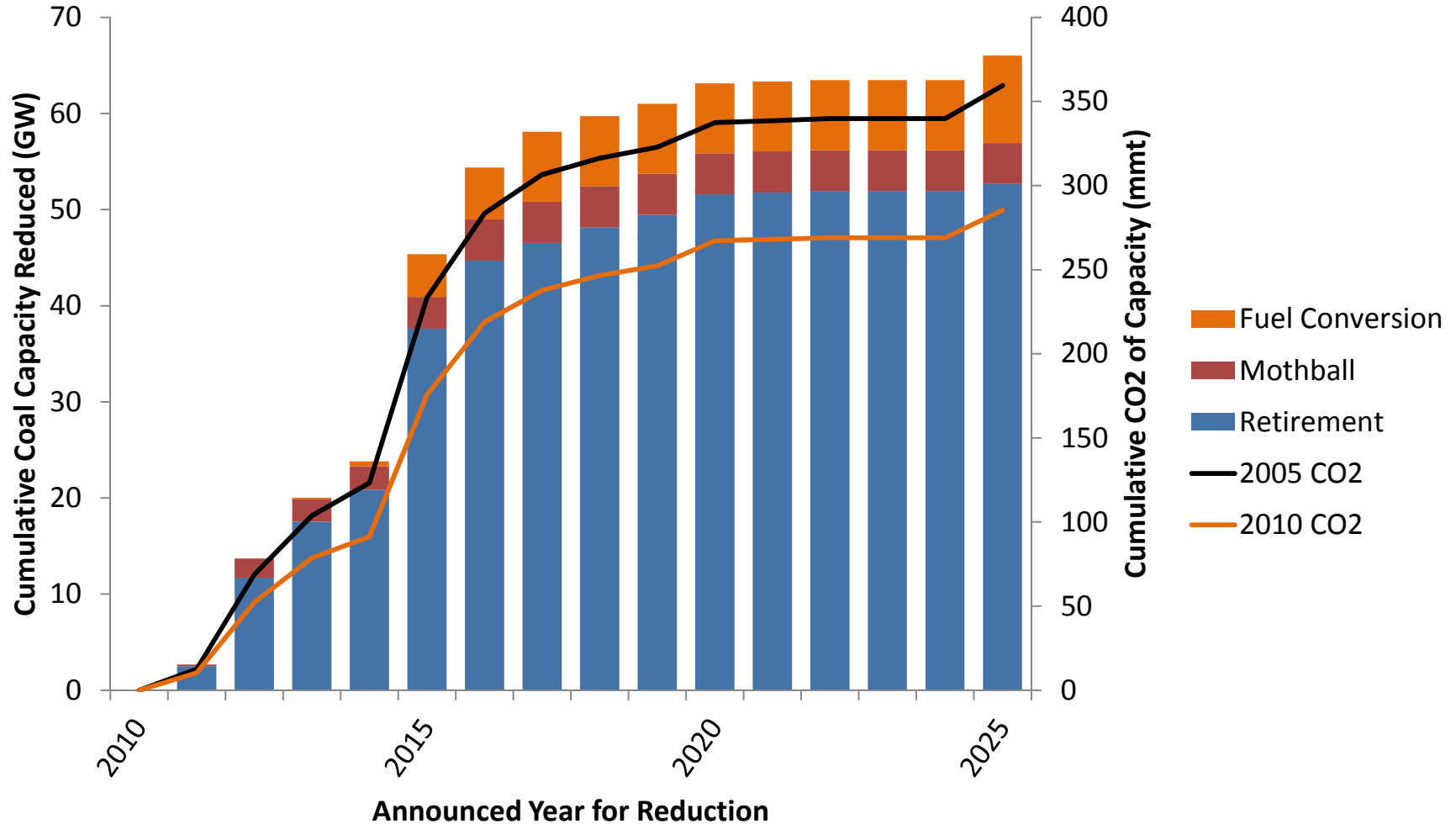
NYISO Environmental Advisory Committee Meeting

Albany, NY

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# Announced Coal Capacity Reductions and Their Associated 2005 and 2010 CO<sub>2</sub> Emissions

Cumulative Announced Reductions of Coal Capacity Since 2010



# Language of Clean Air Act Imposes Limits

- Section 111(d) seldom used
  - Applies to what's not regulated elsewhere
  - Some confusion as Senate-House conference differences not reconciled in CAA Amendment
- Language seeks “system of control that has been adequately demonstrated”
- EPA can include costs, useful lives, other impacts
- Regulation through State Implementation Plans
  - EPA sets standards
  - States implement
  - EPA accepts or rejects

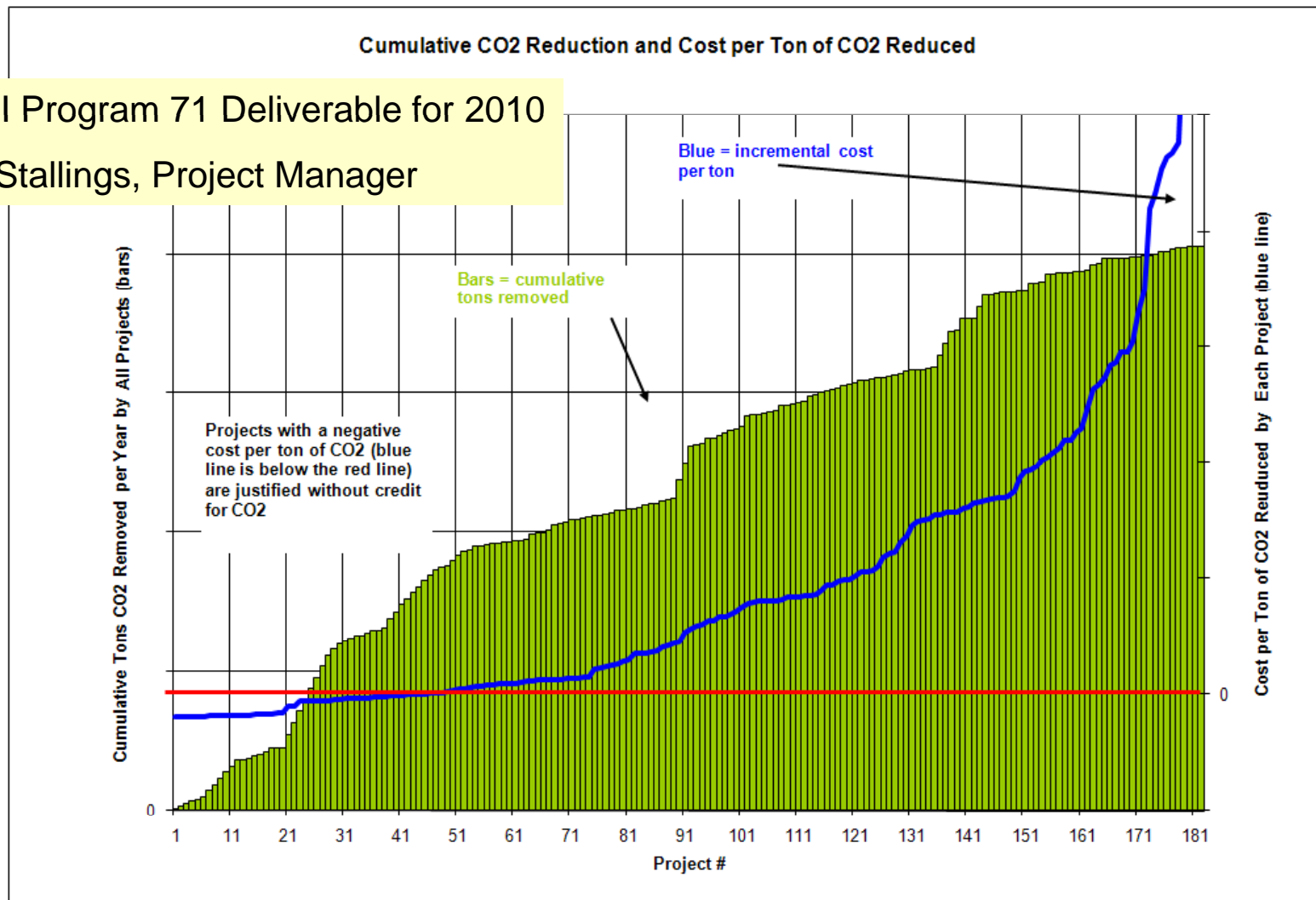
# Initially EPA Seemed Interested in Basing ESPS Regulations on Heat Rates

- EPA interest in regulation based on unit efficiency
  - Public comments by EPA staff
  - EPA sponsorship of RFF and Sargent & Lundy studies
  - Consistent with setting standards at unit level?
- Different approaches to analyzing heat rate improvements
  - Statistical (RFF)
  - Bottom up engineering case studies (Sargent & Lundy)
  - Company fleet CO<sub>2</sub> case study (EPRI Program 71)
- Best analysis indicates will be difficult to secure more improvements beyond 2-3% without great expense

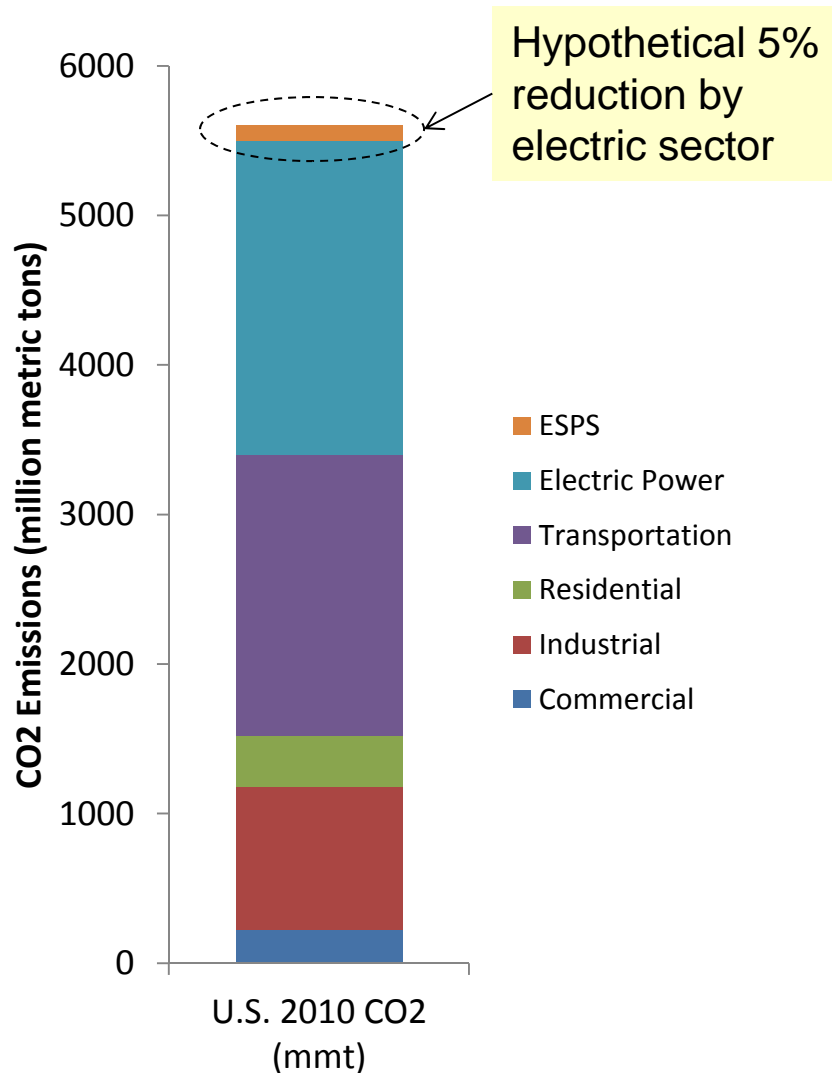
# EPRI Case Study Focused on Cost of CO<sub>2</sub> Reductions Through Heat Rate Improvements

EPRI Program 71 Deliverable for 2010

Jeff Stallings, Project Manager



# Heat Rate-Based Regulations Unlikely to Yield Reductions Worth the Regulatory Effort



- 5% efficiency improvement target been suggested as goal (RFF)
- Few generating units able to improve heat rates beyond 2-3%
- Any Federal-State regulatory program under Section 111(d) likely to be administratively complex, expensive, and broadly litigated
- All this for 2% of national CO<sub>2</sub> emissions?
- Current expectation is EPA will seek flexible (trading) mechanism with potential for greater reductions

# Flexible Programs Allow EPA to Regulate Units but Allow Compliance Elsewhere

- Flexible policy designs offer opportunities to lower cost
- Challenge showing enforceable links to regulated units
- Many choices in program design and stringency
  - Mass-based (trade tons) most familiar
  - Performance-based (emission rates) may be easier to link to regulated units
- Many other choices and tradeoffs, e.g., stringency, baseline periods, credit for early action will determine:
  - Emission reductions
  - Who/where emissions reduced
  - Who pays and how much

# What Might a Tradable Emission Rate Standard Look Like?

- Set emission rate target in average CO<sub>2</sub>/MWh per year
- If unit is under, creates credits, if over, requires credits
  - Example for standard of 2,000 lb/MWh
    - if unit's CO<sub>2</sub> rate is 1,900 lb/MWh, then unit creates 100 lb of credits for each MWh of operation
    - If unit's CO<sub>2</sub> rate is 2,200 lb/MWh, then unit will need 200 lb of credits per MWh of output
  - In many respects this is like getting a free allocation of 2,000 lb per MWh
    - but, only get credits if you run (this is an intensity target)



## Example - continued

- At end of year submit statement (and lb credits) showing annual MWh and annual CO<sub>2</sub> lb (from CEMs)
- Formal registry/clearinghouse supports trading, participants can contribute credits as year progresses

# Initial insights on Tradable Performance Standards for CO2 Emission Rates

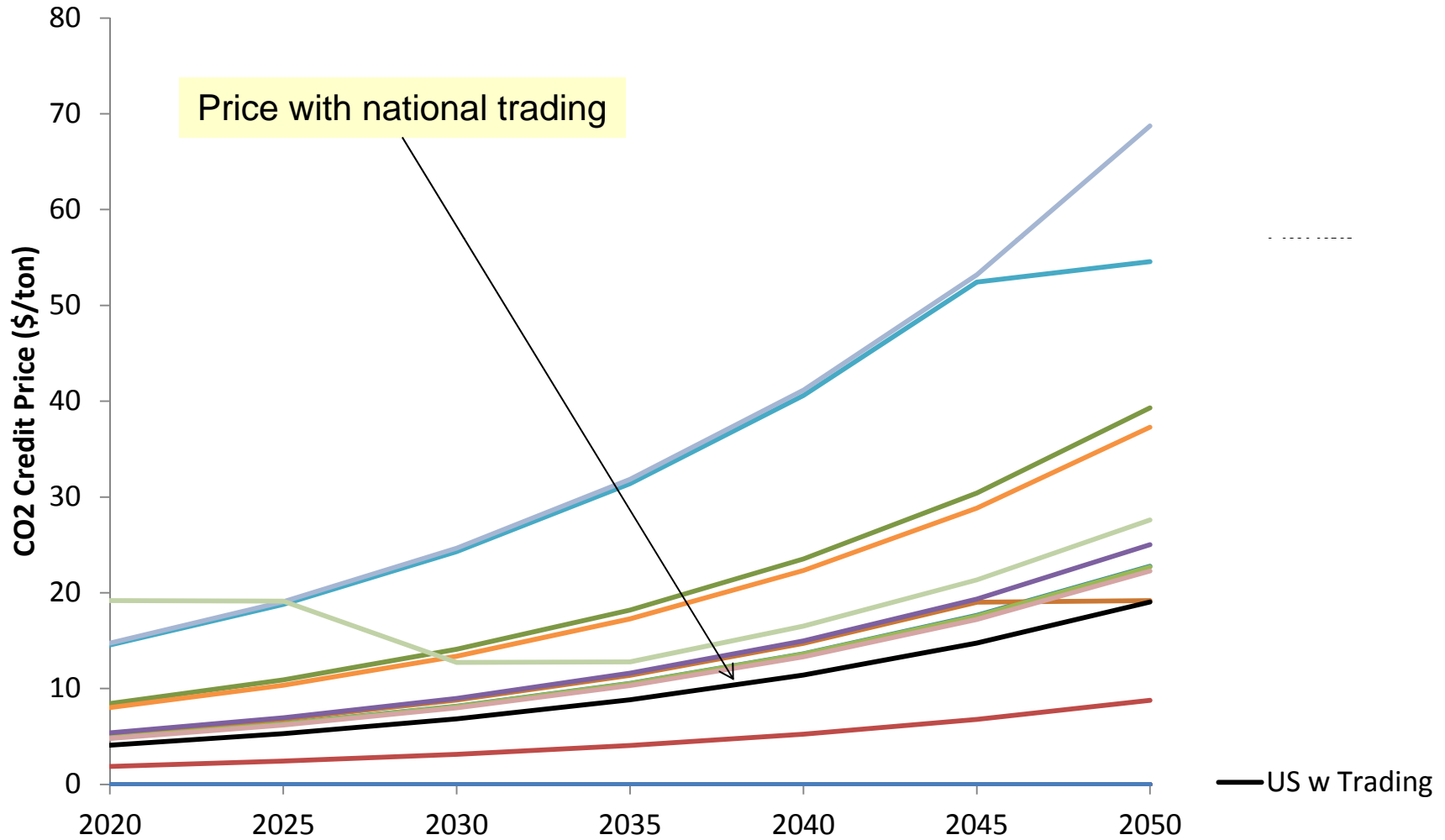
- Trading tons but metric for compliance is MWh
- Need units below standard to create credits for units above standard
  - Incentive to run low-intensity units more, high units less
  - Positions (cumulative balances) evolve over year (with possible end-of-year dramatics?)
  - If ratchet down standard may get non-linear response that could blow up the market
- May need an “escape valve” to prevent market meltdown
- Impact on dispatch, interstate power flows, emission flows, etc., could be much more complicated than tons-based trading

# State's Option to Trade Lowers Overall Costs But May Benefit Some More Than Others

- Key decision is whether you want your state to be trading with other states or bottle in the market
- How you feel about it may depend on:
  - Is state expected import or export credits
  - Is state power exporter or importer?
  - Are you a power seller or buyer?
  - If you are a power exporter, when do you want your state to be trading tons with counter party states?
- EPRI is prototyping analysis tools to help companies understand the tradeoffs for these and other design decisions

# Credit Prices When Each Region Meets Policy Goal on Its Own

4% Fossil Credit Prices w No Trading





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