



Getting There Together: Multistate Compliance Options for Section 111d

Washington DC

28 July 2014

Flexibility through Trading in 111(d) Implementation

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Overview

- * Very brief history of how we got here
- * Commission interests in cap-and-trade design
- * How 111(d) trading differs from Waxman-Markey
- * Critical questions and unknowns going forward

Brief History

- * Trading has a pretty good track record in air regulation
- * Big advantages are flexibility and lower costs – two sides of the same coin
- * Trading was central to the architecture of
 - * the Kyoto system
 - * Waxman-Markey
 - * Existing state systems

Brief History

- * Waxman – Markey :
 - * NARUC coordinated commission interaction with legislative staff and executive agencies on design issues of interest
 - * Commission interests were fairly well represented in the legislation that passed the Senate– use of allowance value in particular

General Commission Interests in Trading: Price Effects

- * Size of the cap
 - * Relative to covered entities
 - * Path over time
- * Extent of covered entities
 - * Sectoral, economy wide, linked sectoral programs
- * Cost containment provisions
 - * Use of offsets
 - * Risk management (safety valves, off ramps, alternative compliance payments, etc.)

General Commission Interests: Use of Resources

- * Use of allowance value
 - * **Cushion rate increases****
 - * **Invest in energy efficiency****
 - * **Targeted assistance***
 - * General revenue
 - * Rebates to taxpayers

How is 111(d) different (oh so many ways)

- * The trading system is an (anticipated) add-on, not integral to program design
- * States, not the federal government, are individually responsible
 - * Trading will only take place through voluntary choice by states
 - * States can choose to join together with EPA approval of their joint responsibility

GHG limits – and trading -- could be rate-based or mass-based

- * Rates are inherent in the way Section 111 is structured
- * Rates put no overall limit on GHG emissions
- * EPA's inclusion of the possibility of transforming rate-based limits to mass-based limits
 - * Would create a **much** easier route to multi-state trading
 - * More straightforward to value and account for energy efficiency
 - * Significant issues – with lots of money at stake – in calculating mass-based limits

Rate-based trading

- * No hard cap on emissions**
- * Functions as a production subsidy for generation sources below the average
- * *Allowance allocation and use of value will require new models*

Rate-based trading

- * Trading between states that have different rates will be complex – likely require some complex version of exchange rates based on volume – which would be uncertain until final generation numbers were known
- * Meeting GHG goals will argue for some way to prevent arbitrage so that a high rate state cannot increase its share if that also increases emissions
- * Lots of questions that will have to be answered by EPA and very likely the courts

Mass-based Trading

- * Mass-based programs
 - * Hard cap on emissions
 - * Translating rates to quantities requires models and assumptions, and EPA has yet to offer specifics
 - * Choosing a mass-based program entails more risk if electricity demand is high, but offers cost savings if it is low
 - * The mechanics of programs – especially multi-state trading – are much more straightforward with mass-based limits

Mass-based Trading

- * Mass-based programs
 - * Inclusion of key elements of Waxman-Markey are feasible but not straightforward
 - * use of allowance value for commission-directed uses
 - * Offsets and cost containment mechanisms
- * RGGI and California will likely be in the forefront of figuring out how the 111(d) rates are going to translate into quantities

Interaction with 111(b) New Source Standards

- * Pending full clarity and further rules
 - * Mass-based programs likely offer bigger savings from bringing new sources online
 - * Rate-based programs offer more flexibility for states that do not intend to bring significant new capacity online
 - * Any direct connection between 111(b) and 111(d) mass-based programs is technically challenging and legally murky – but there is a strong policy rationale for such a connection

Leakage

- * If implementing these rules causes a significant increase in electricity price
 - * Incentives to switch to small non-utility generation, direct heat and other forms of power could increase
- * Combination of mass-based limits in some states and rate-based systems in others could lead to cross-state effects that increase emissions

Allowance Value

- * This is potentially a huge difference in rate-based and mass-based programs.
- * Under mass-based programs, allowance value should be a direct part of pricing, and the same options – especially for commissions --as in Waxman-Markey are at least theoretically on the table
- * Under rate-based programs, this will be a much more difficult policy design task

Critical Questions/Unknowns for Trading

- * What will constitute acceptable methodology for computing mass-based caps **
- * Is there any scope for EPA move toward and combination of the 111(b) and 111(d) rules to try to limit total emissions?
- * What kinds – if any – trading-specific flexibility and cost-containment tools will be allowable

Critical Questions/Unknowns for Trading

- * What rules will govern inter-state rate-based trading – will it be feasible?
- * Will commissions have access to use allowance value for
 - * Rate cushioning or rebates
 - * End-use efficiency programs

Trading in Perspective

- * Trading works by providing incentives, scorekeeping, and structure for the actual activities that reduce GHG emissions
- * Trading is a complement to end-use reduction, dispatch efficiency, increased generation efficiency, switch to lower-GHG generation, etc. – not a substitute. The activities themselves make the reductions.
- * Putting an explicit or implicit price on GHG emissions is highly desirable – almost necessary –for **efficiently** meeting GHG goals. It is by no means sufficient.

Bottom Line

- * 111(d) and the CAA in general are not great frameworks for controlling GHGs efficiently and flexibly
 - * but EPA has done a pretty good job of trying to allow efficient mechanisms
- * Still a lot of technical, policy, and legal questions to be answered
 - * and this uncertainty in and of itself is an impediment to efficient implementation because it delays response

Bottom Line

- * There is no guarantee that states will choose trading, and no certainty that rate-based trading will prove viable. Tradeoff between
 - * Potential cost-savings and flexibility
 - * Complexity and the political unpopularity of cap-and-trade
- * **If** evolution toward a long-term framework for GHG limits is important
 - * Mass-based trading is the option that will make that evolution the easiest

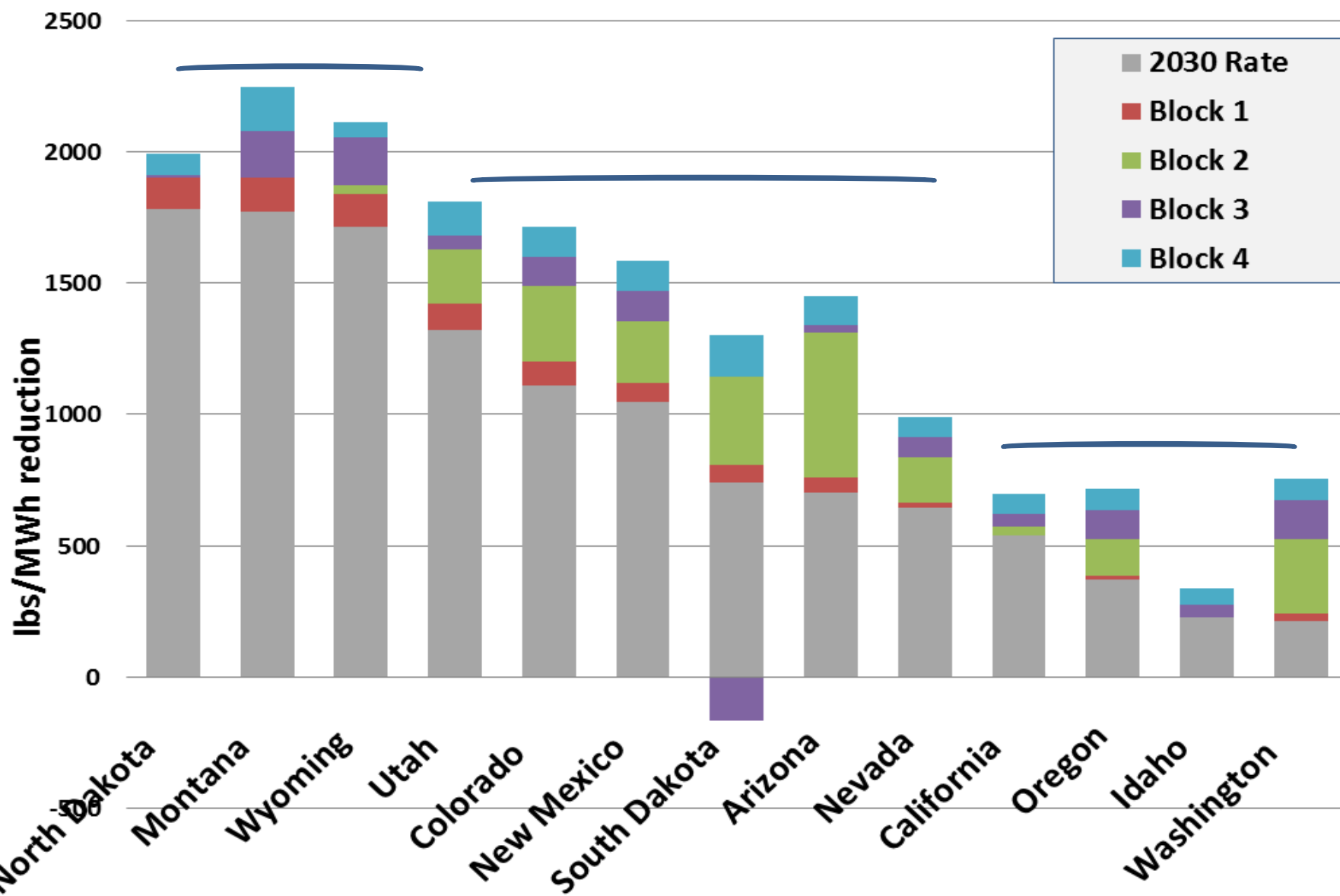


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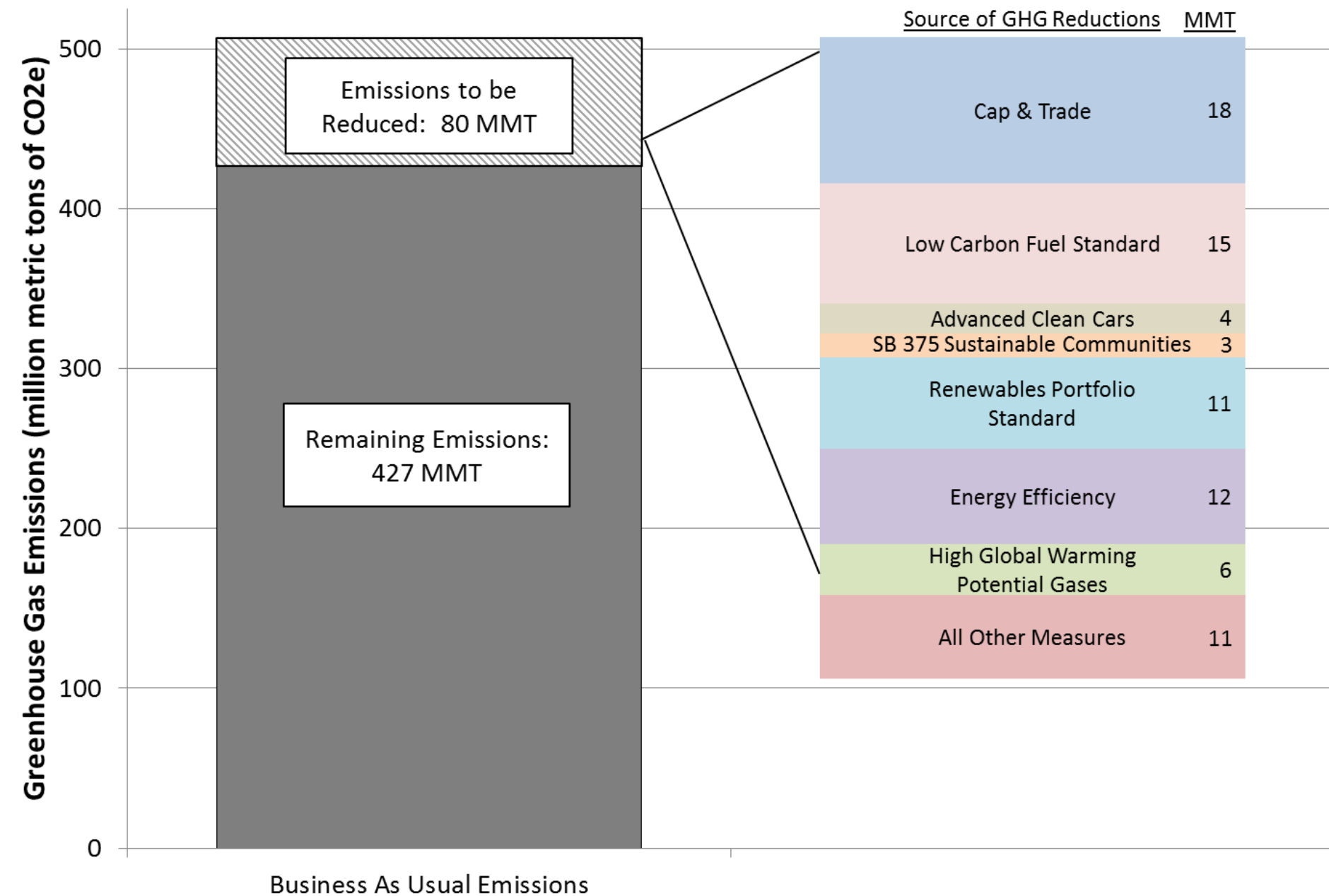
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State 2012 to 2030 Emissions Rates



2020 Greenhouse Gas Emissions and Reductions





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Carbon markets and power markets under the Clean Power Plan

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Outline

- Carbon pricing approaches
 - Cap and trade vs. rate-based standard
- What ISO's do to account for carbon
 - Answer: usually, nothing
 - But complications when state policies differ

Approaches to Carbon Pricing: Cap-and-Trade (“mass based”)

- Limits total CO₂ from covered sector
 - Firms must acquire allowances to offset each ton of CO₂
 - Limits do not vary with conditions (e.g. MWh demand)
- Discovers an implicit price on carbon (allowance price) that firms internalize into supply costs/offers.
 - Also creates allowance revenues for allocation
- Adds to marginal cost of all sources with non-zero carbon intensity
- If marginal resource emits carbon, power prices will go up

Approaches to Carbon Pricing: Intensity (“rate-based”) standards

- Limits emissions *rate* (CO₂/MWh)
 - Rate does not vary with MWh, but total carbon will
$$\frac{\text{CO}_2 \text{ Emissions}}{\text{MWh Generation} + \text{EE MWh saved}}$$
- Discovers a cost to *balancing* emissions down to the rate target
 - Adds to the marginal costs of sources above the target
 - **Reduces** the marginal cost of sources *below* the target
- Price effects will depend upon conditions, but could easily lower electricity market price
- Can be converted into a regional rate But not clear that all states have an incentive to do that

What should ISOs do to reflect carbon pricing?

- Best case: nothing!
 - All states in a market footprint adopt the same approach (mass-based or rate-based)
 - Carbon pricing incentives will be reflected in costs and offers to markets
 - Market power mitigation rules should reflect these costs
 - Environmental dispatch happens organically through adjustments in offer prices by generators
- RTOs can implement environmental dispatch but need a way to allocate responsibilities/costs for reductions across states
 - Carbon markets do that for them
- Major headaches if different approaches taken by states sharing a market
 - California and imported electricity
 - California's proposed EIM

Cal ISO and Carbon Pricing

- California imports a lot of carbon-intensive power
 - Cap-and-trade rules try to “reach” those sources by placing obligations on importers (“first-deliverers”)
 - System is vulnerable to resource
 - (see FERC letter to Mary Nichols)
 - Minimum CAISO changes required
- Newly forming western Energy Imbalance Market places this issue inside the CAISO market pricing platform
 - CAISO will have to determine plants will be “exporting” to California as part of the dispatch

Worst-case (likely?) Scenario:

Cap-and-trade *and* rate-based states

- Carbon prices in the two regimes reflect very different types of costs and provide different incentives for offer prices
 - Imports from rate-based states will lower carbon output in capped states (less local emissions)
 - Coal plants in rate-based states may look cheaper than gas plants in capped states.
- Not yet clear if EPA will allow states to make border adjustments for carbon in imported power as California does today
- ISO's may have to adjust offers from plants depending upon what regime their state has adopted in order to reconcile conflicting incentives
 - “unenvironmental re-dispatch”

Summary

- Cap-and-trade and rate-based standards produce implicit, but different, carbon prices for generators
- If all states sharing a power market adopt the same approach, ISOs don't have to change much at all
 - RTO/ISO led approach conceptually very attractive
 - But ISOs and State boundaries not uniform
- If an ISO market spans states with differing approaches, power prices and carbon goals could easily be distorted
- To reconcile inconsistent carbon prices, ISOs (or someone) would have to penalize rate-based plants and/or subsidize capped plants in the dispatch calculation.

Out of time?

Thank you

Other Issues

- Scope of cap-and-trade
 - Markets (California) that cover many sectors trading with electricity only sectors?
- Implications for directed state policies (RPS)
 - When linked in a single market, additional policies to reduce CO₂ create headroom for other States to increase emissions under the joint cap



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Sailing Uncharted Waters: A PJM Perspective on Regional Compliance Options for Sec. 111d:

**Presentation to NARUC Workshop
July 28, 2014**



Craig Glazer

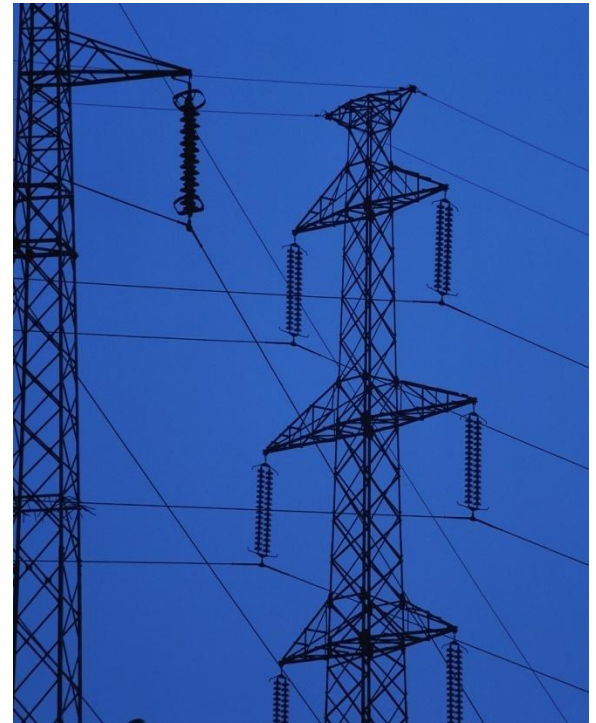
Vice President – Federal Government Policy
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- Review of ISO/RTO Council Proposals
 - Reliability Safety Valve
 - Regional Compliance Measurement
- Dispatch Options
- Issues for Further Consideration



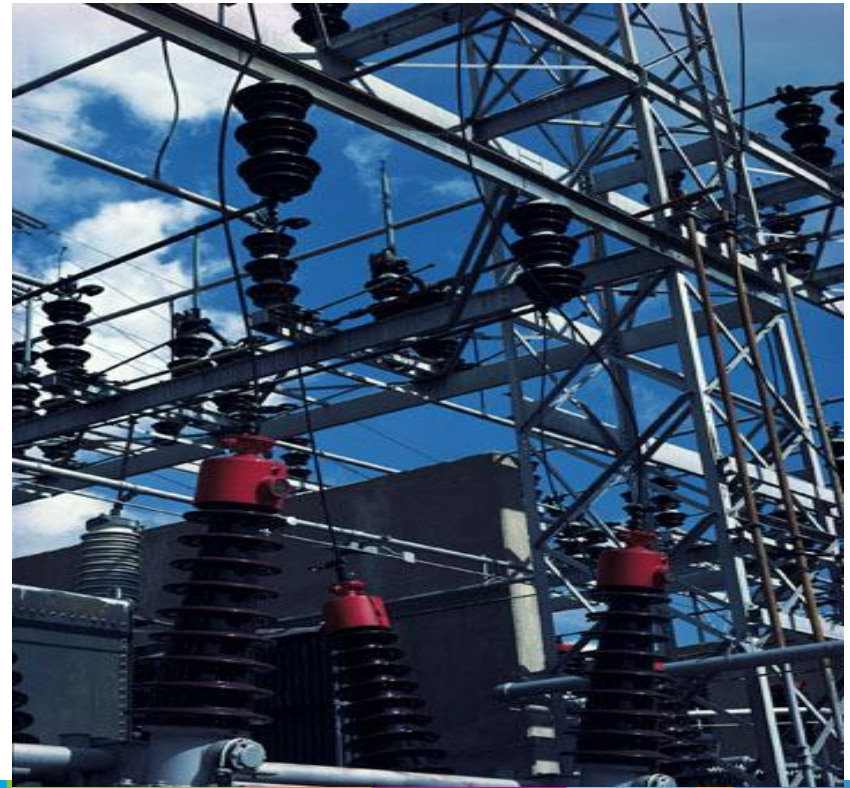


IRC Reliability Safety Valve Proposal



- Similar to the Reliability Safety Valve for MATS
 - Keeps generation resources on-line to maintain reliability until a transmission solution can be implemented to ensure retirements do not jeopardize reliability
- Proposed Reliability Safety Valve for 111(d) has additional features
 - Up front analysis of SIPs to check for possible reliability issues intra-state and inter-state both long-term retirements and short-term operations.
 - On going analysis after implementation as generation resources may retire well after compliance obligations begin depending on flexibility of SIPs...in contrast MATS has a hard deadline for emissions rate compliance
 - Ongoing analysis of retirements same as MATS retirement analysis...standard deactivation analysis
 - Ongoing analysis of commitment and dispatch operations as this could be impacted depending how states implement 111(d)

IRC Regional Measurement Proposal

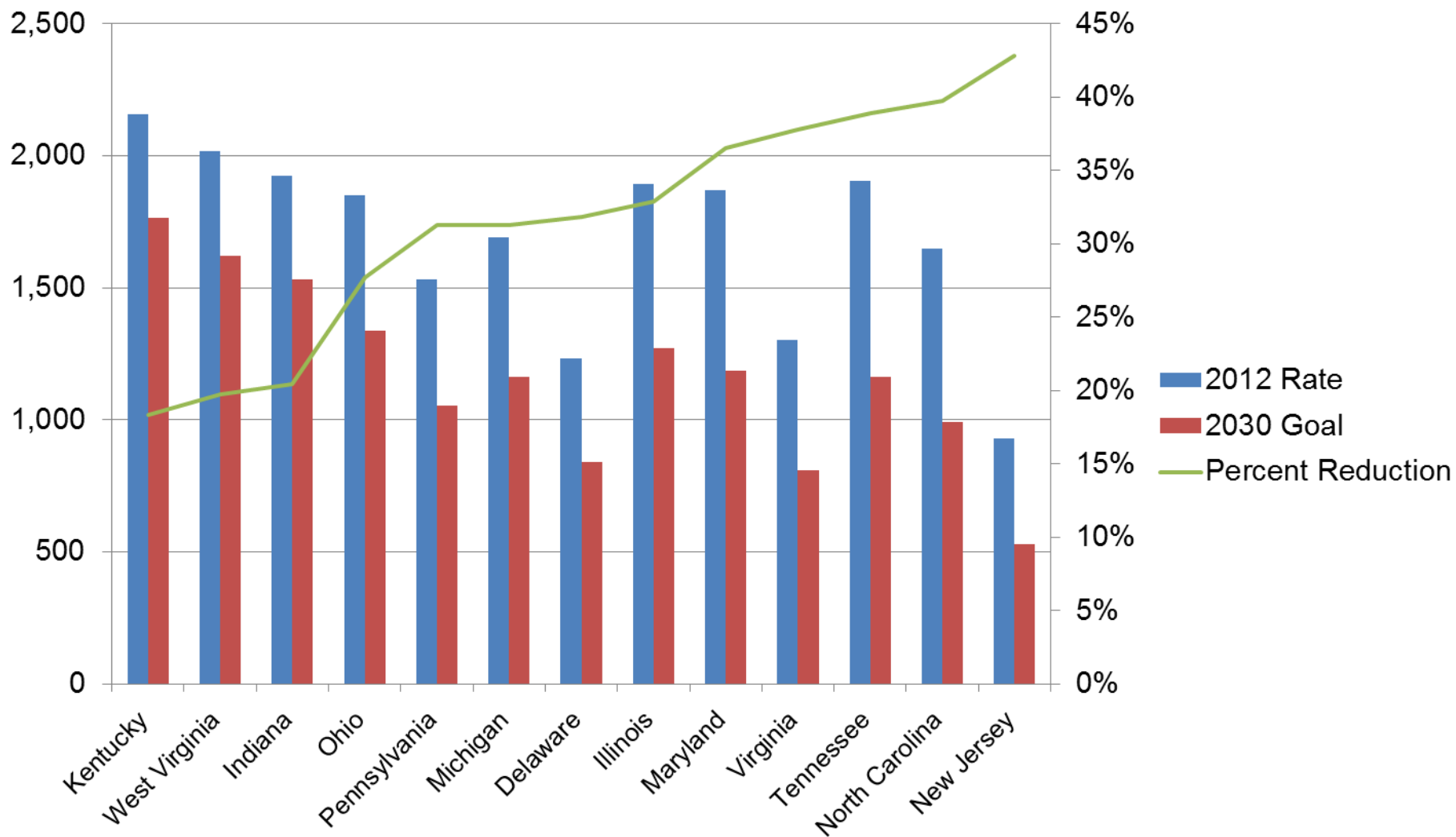


- Provide an option for state-submitted plans to measure compliance on a regional/RTO basis
- Leverages the economies of scope and scale and cost-effectiveness of RTO-wide markets and institutions
 - Cost-effective security constrained economic dispatch across an RTO is already taking place and would make compliance more cost-effective
 - Resource adequacy constructs allow for the cost-effective sharing and transfer of resources across the region
 - Region-wide transmission planning process
 - Market rules already exist in RTO markets to account for the cost of environmental compliance in general

Dispatch Options/Considerations: *The Menu of Choices*

***Disclaimer: Not PJM-endorsed proposals
but merely review of the range of options
in discussion nationally***





- *Regional Measurement*

- Individual state targets remain but modified by measurement in the aggregate on regional basis
 - Emissions rate standard vs. mass-based standard

- *Regional Coordination on Individual Building Block Elements*

Individual state plans and targets but:

- Agreed modifications to regional renewable target
- Agreed modifications to “at risk” nuclear target
- Agreed modifications to energy efficiency or gas capacity factor targets

- *Individual state-directed unit run time limitations*
 - Depending on complexity, could be incorporated building on existing run time limitations
 - Computational complexity/opportunity cost recovery?
 - Due to differing state targets, could lead to dispatch of less efficient units in neighboring states and higher costs
 - Run time limitations would need short-term reliability override
 - Run time limits would drive transmission upgrades with resulting cost allocation challenges

- *Price on CO₂ emissions*

Various flavors:

- Could be regional or on a stand-alone state basis
- Mass-based approaches---allowance allocation
- Requiring fossil units to buy from zero emissions units
- Formalized cap and trade across the state or region

- *Full “Environmental Dispatch”*

- Formal abandonment of economic dispatch
- Pure dispatch based on emissions without respect to price
- Raises significant reliability and economic challenges in short term operations

Other Issues for Consideration:

- Impact of the formula: Measuring BSER by state leads to disproportionate burdens in requiring overall reductions in each state based on its projected BSER achievements
- RPS: Renewable resources purchased from neighboring states do not count in purchasing state
- Nuclear: Impacts of assumed at risk nuclear
- Cost Impact: Dispatch still based on regional marginal costs of compliance (not average cost)

The Task Ahead: Blocking, Tackling & Teamwork!



LET'S TALK...



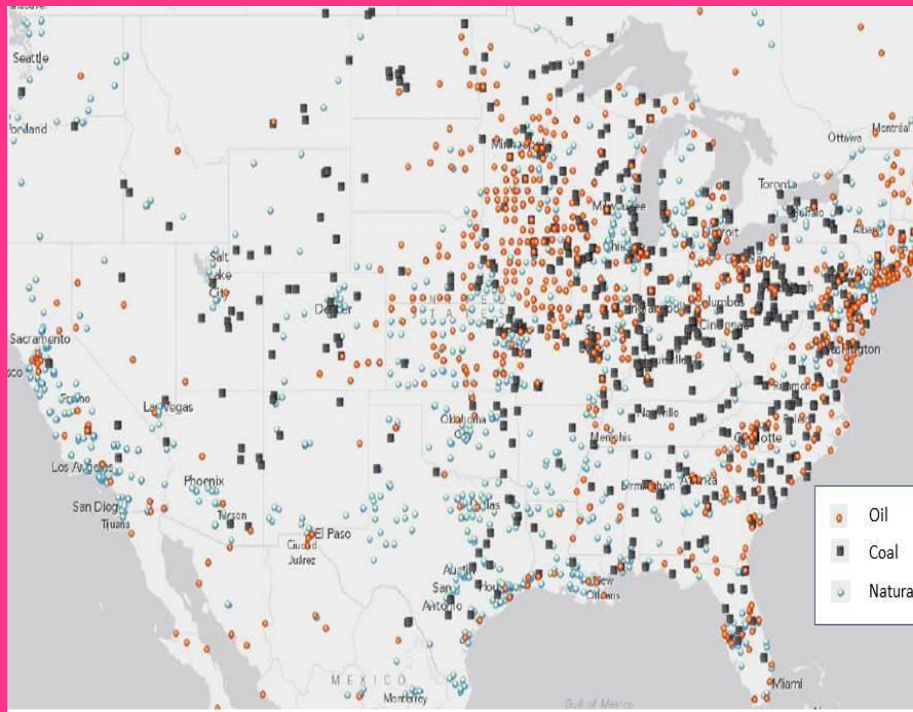
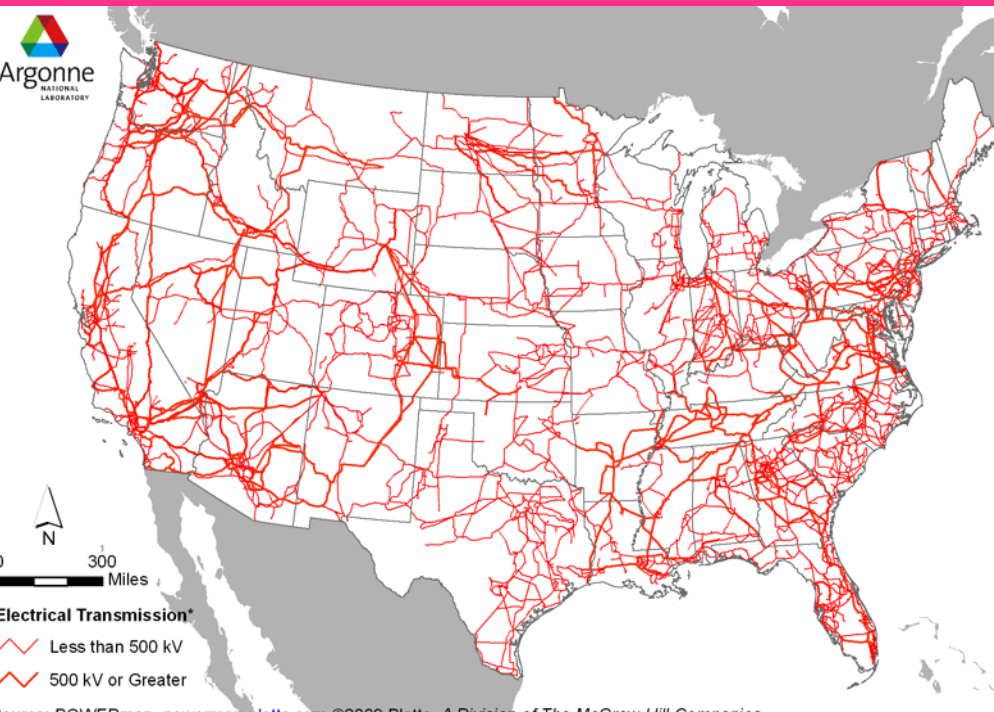
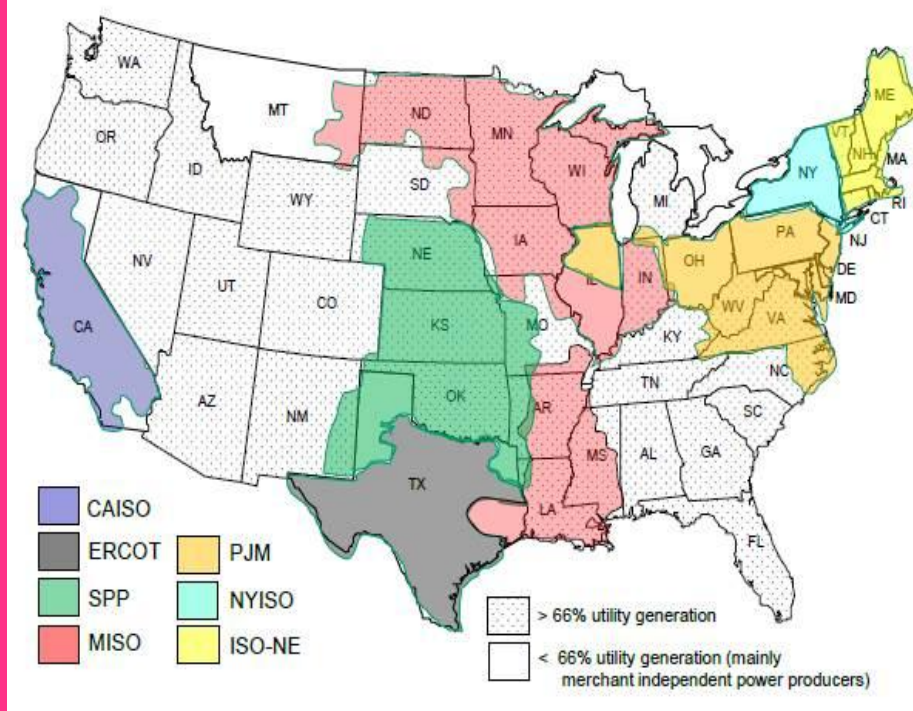
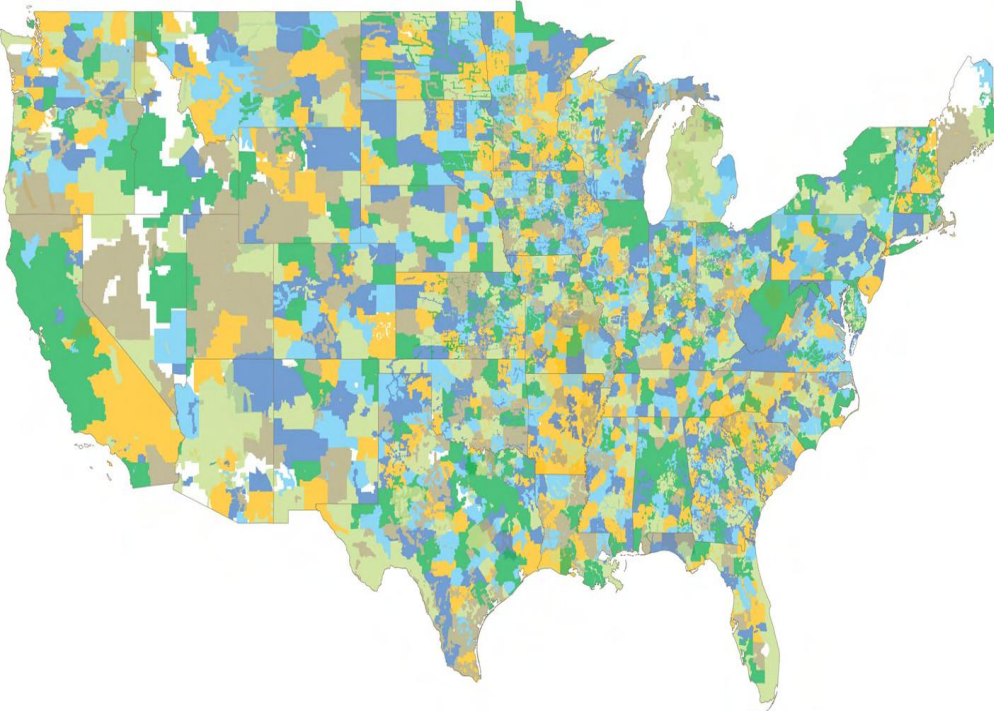
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For plants in each RTO, averaging (and/or trading) across units owned by multiple companies within a common multi-state RTO, enabled through interstate agreements with states in that RTO. In state with units outside of an RTO, averaging (or trading) among those other units but not with units in the RTOs.