



Allowance Allocation – Is There A Preferred Approach?

CCAP Air Quality Dialog

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Presentation Overview

- CO₂ Regulatory Approach & Allocation
- Allocation Methodology Fundamentals
- Auction v. Allocation
 - Societal v. Distributional Impacts
 - Energy Price Impacts
 - Asset Value Impacts
- Revenue Neutral Allocation Approach
- Conclusions and Questions

CO₂ Regulatory Approach

- CO2 Regulatory Approaches can be examined in terms of:
 - Ease of Implementation
 - Upstream, downstream, large emitters
 - Carbon Target Certainty
 - Includes economy-wide v. sector specific, cap vs backstop price
 - Cost Certainty
 - Cap v. backstop price
 - Cost Effectiveness
 - Achieving reasonable level of reductions at reasonable cost. Are the right sectors targeted, offsets allowed?
 - **Distributional Effects**

Allocation Options – Fundamentals

	Input	Output
Historic (Grandfathering)	X	X
Updating	X	X
Auction		X

Allocation Options – Fundamentals

■ Input vs. Output

- Input-based allocation (lb/mmBtu) takes into account the emissions content of the fuel
 - Particularly relevant for CO₂ (coal vs. natural gas), but also NO_x, SO₂ and Hg
- Output-based allocation (lb/MWh) also takes into account the relative efficiency (heat rate) of the unit
 - Potentially broadens the universe of plants receiving an allocation

■ Static vs. Updating vs. Auction

- Static allocation based on historical activity levels -- awards established entities and prejudices new entrants (which would effectively face an auction system)
 - Allowance set-aside for new units can mitigate effective “barrier to entry”
- Updating allocation usually conceived as being based on a rolling average baseline -- allows new players to become established in the allocation system
- Auction treats all players the same – need to purchase to emit, but has proportionately greater impact on existing, higher emitting units

Auction v. Allocation – Societal v. Distributional Impacts

- From **Societal** perspective, auction can be the most economically efficient **if**:
 - The auction revenues are used efficiently.
 - Could be used to lower the cost of a cap & trade policy if auction revenues are used to offset existing taxes on capital and labor – which already discourage economic activity.
- From **Distributional** perspective
 - Auction revenues could be used to offset (compensate) the distributional effects of a CO₂ policy by giving allowances or auction revenues to:
 - Consumers
 - Producers
 - Existing
 - New

Auction v. Allocation – Energy Price Impacts

■ Competitive Market

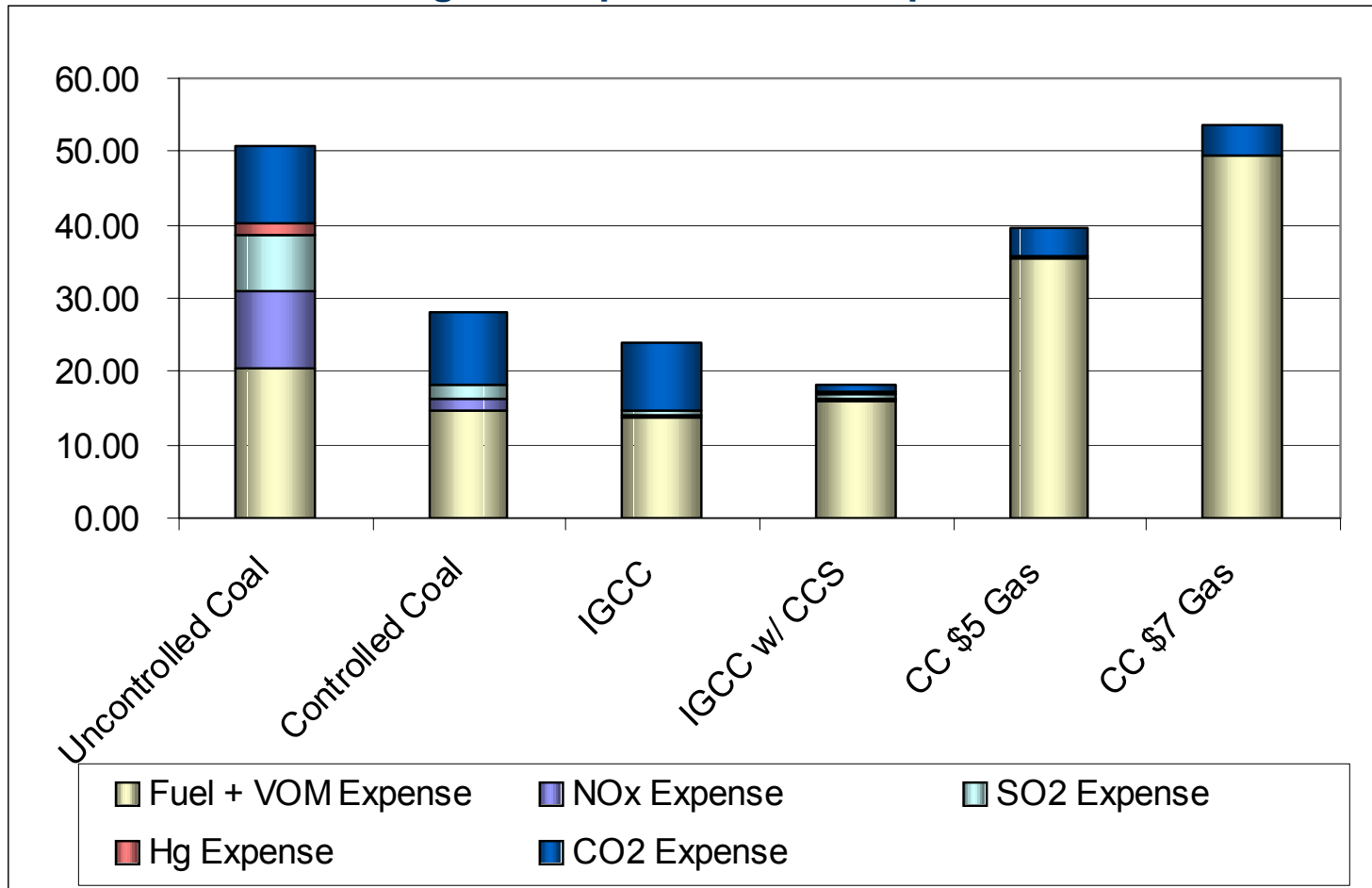
- Auction and grandfathered allocation system have same effect, so long as all allowances make it into the market
- Allowance costs are added to the marginal cost of generation and increase total energy costs – that are passed on to customers
- Updating can have “perverse incentive” effect in that generation today earns future allowances (income).
 - Future earned allowances have effect of subsidizing current marginal cost of generation and therefore energy prices.
 - How this works in actual markets will depend upon how the allowances are allocated (including issues of lag, regulatory certainty) and price certainty associated with the allowances.

■ Regulated Market

- Allowance costs may not be accounted for if they are allocated at no cost (either grandfathered or updating) – zero cost point.
- Moving to an auction system would result in a change to how allowance costs are treated – potentially passed on to customers (similar to fuel charge).

Market Based Air Regulations Fundamentally Change Dispatch Costs

Marginal Dispatch Cost Comparison

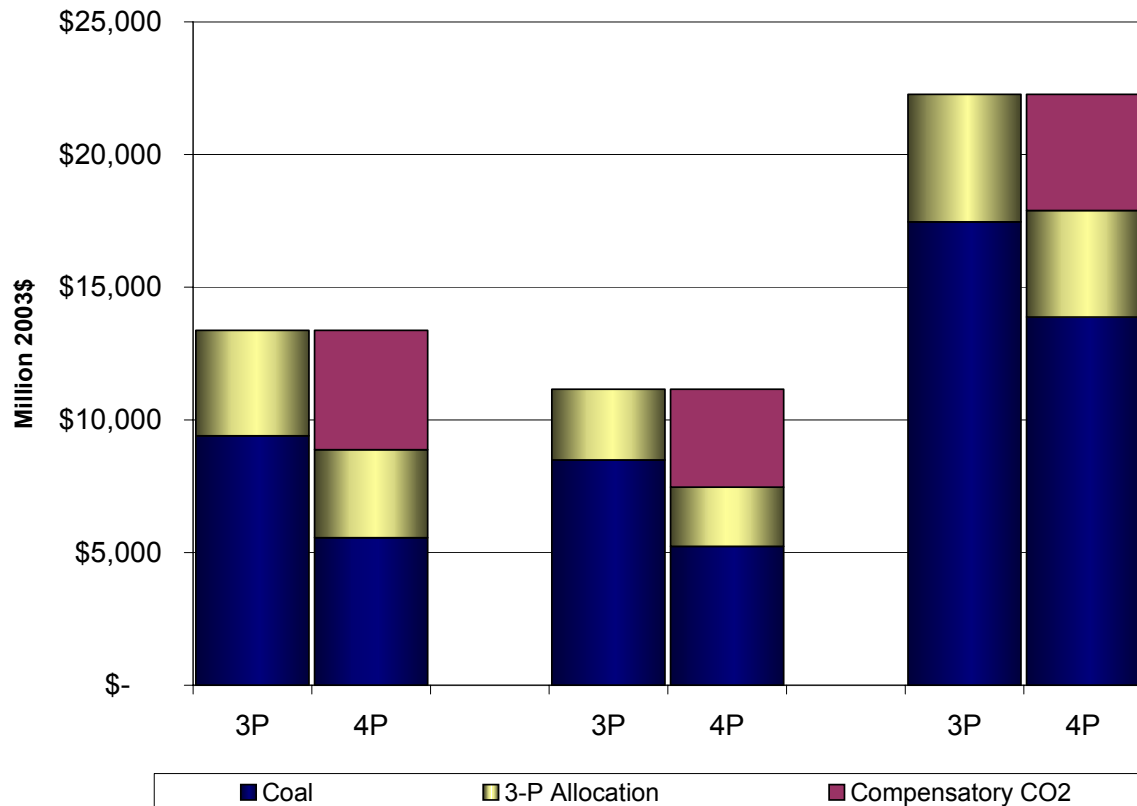


* Allowance prices converted into variable cost of generation. Assumes multi-pollutant policy resulting in \$35,000/ton Hg, \$1,500/ton SO₂, \$3,000 ton/NO_x, and \$10/ton CO₂ allowance prices.

Allocations Greatly Influence a Company's Bottom Line in a Competitive Market

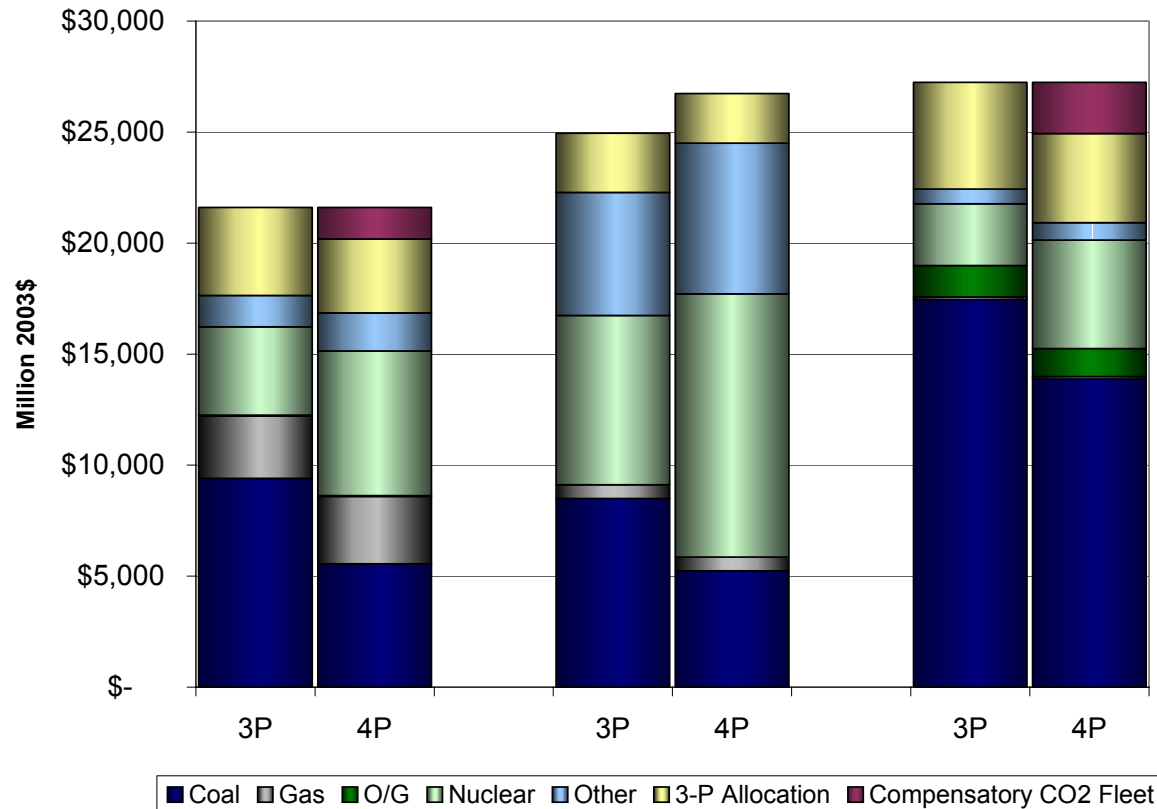
- How allowances are allocated under future environmental regulations greatly influences a company's net position in the allowance market and the value of its generating units
 - Especially prominent for carbon
 - Value of allowance allocation can rival the value of generating assets
- By isolating the value of the allowance book, can start to analyze the impact of different allocation methodologies
 - Input (lb/MMBtu) vs. Output (lb/kWh) based
 - including universe of units that receive an allocation
 - Historic vs. Updating baseline
 - Consider potential of power price impact from allowance earning "subsidy effect"
 - Full vs. Partial allocation & transition to auction
 - Revenue neutral allocation methodologies?

Illustrative Revenue Neutral Allocations



- Looked at 3 companies' fleet of existing coal plants that included a range of units.
- Performed asset valuations under a 3-P Reference Case v. 3-P with CO₂
- Given these particular companies' fleet of coal plants operating in their particular power markets, required between 20-30% of their CO₂ allocation be grandfathered to be revenue neutral.

Illustrative Asset Value Neutral Allocations per Generation Fleet



- Asset valuation on the same 3 companies' total generation fleet:
 - Coal, Nuclear, Gas, O/G Steam, Other
- Performed asset valuations under a 3-P Reference Case v. 3-P with CO₂
- Coal units required approximately 10% of their CO₂ allocation be grandfathered for fleet to be revenue neutral.

Conclusions and Questions

- Allowance allocation is key to the design of air regulatory policies and has significant impact on generation asset values and is inherently a political decision
- The method by which allowances are allocated is a key component in determining whether a generating unit, portfolio of units or electric power company is a winner or loser under CO₂ regulations
- Basic Questions:
 - Should a revenue neutral allocation methodology have a place at the table?
 - What is the universe of units that should be included?
 - What is the right reference case to compare asset values to?
 - Should it be done on a unit-by-unit or capacity type by region basis?
 - Does it send the right price signals?
 - What does this do to the total cap level – under or over allocate?
- Other important issues include:
 - Region in which unit operates, including regulatory structure and taxes
 - Stringency of multipollutant policies
 - Timing and interaction of policies

For More Information

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