

Allocation of Emission Allowances: An Economic Perspective

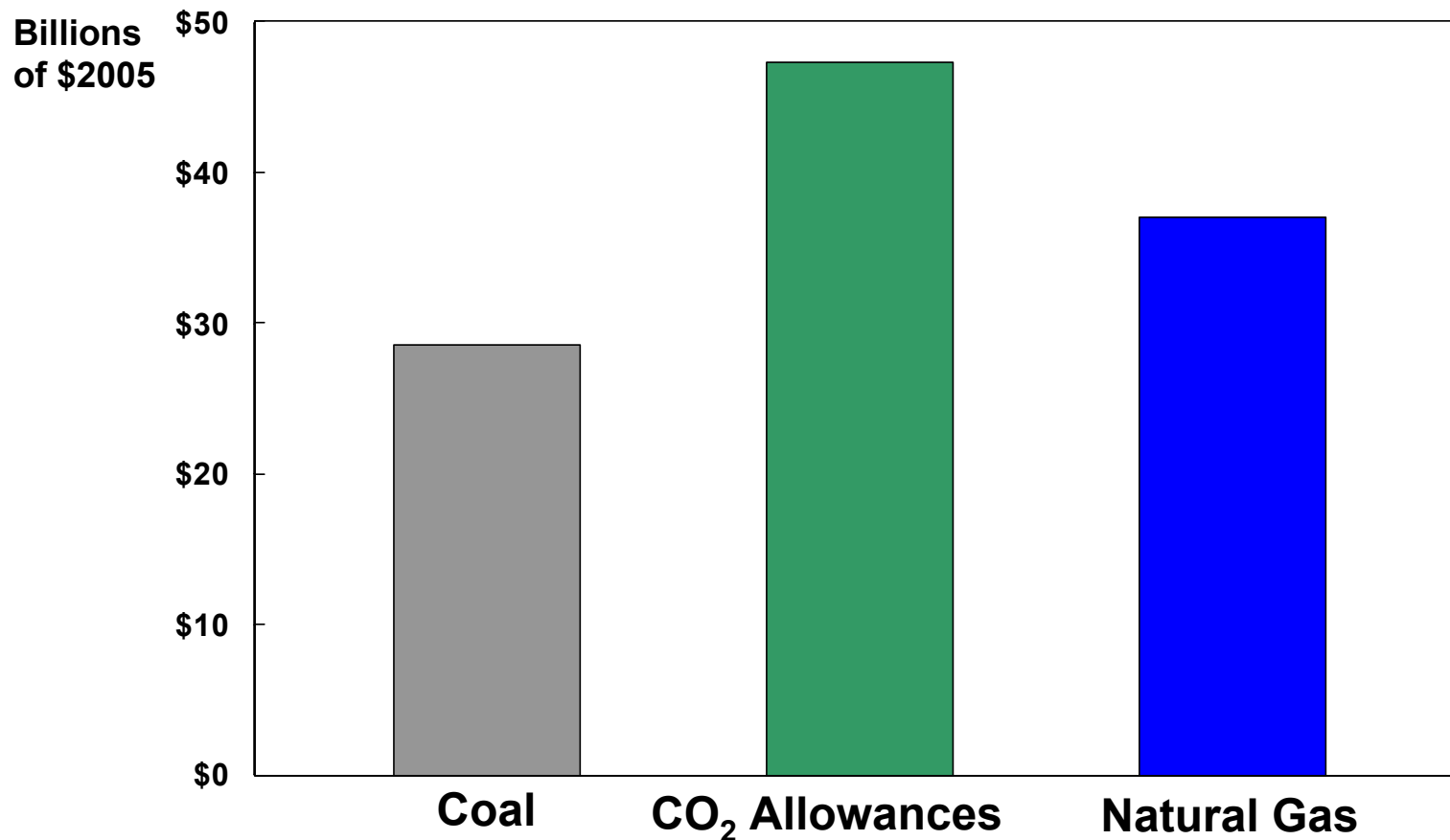
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Value of allowances in a U.S. cap-and-trade system

**EIA Analysis of the Climate Stewardship and Innovation Act (August 2007):
Value of Fuel and Allowances Consumed in the Electricity Sector in 2020**



Overview of allocation decisions

- Key decisions
 - Whether/how much to auction versus freely distribute
 - How to distribute freely allocated allowances
- Allowances can be distributed to any entities, regardless of whether or not they are directly regulated under the cap-and-trade system
- There is no “correct” approach to allocation, the optimal approach depends on what objectives policymakers wish to achieve

Implications of allocation decisions for aggregate costs: The choice between auctioning and free distribution

- Cost-effectiveness arguments offered in favor of auctioning:
 - Creates opportunity for economic gains from “recycling” auction revenue through reductions in existing distortionary taxes
 - Ensures that electricity consumers in regulated regions face full carbon price signal
- Caveats:
 - Gains from revenue recycling depend on regressive tax reform, and the gains from reducing distortionary taxes can be achieved with or without auctioning
 - Regulated utilities could structure rates to ensure that consumers face an efficient price signal with or without auctioning
- Broader lessons:
 - Some uses of the value of allowances create greater economic benefits than others
 - Consideration should be given to how, if at all, allocation decisions affect incentives for particular emission reduction measures

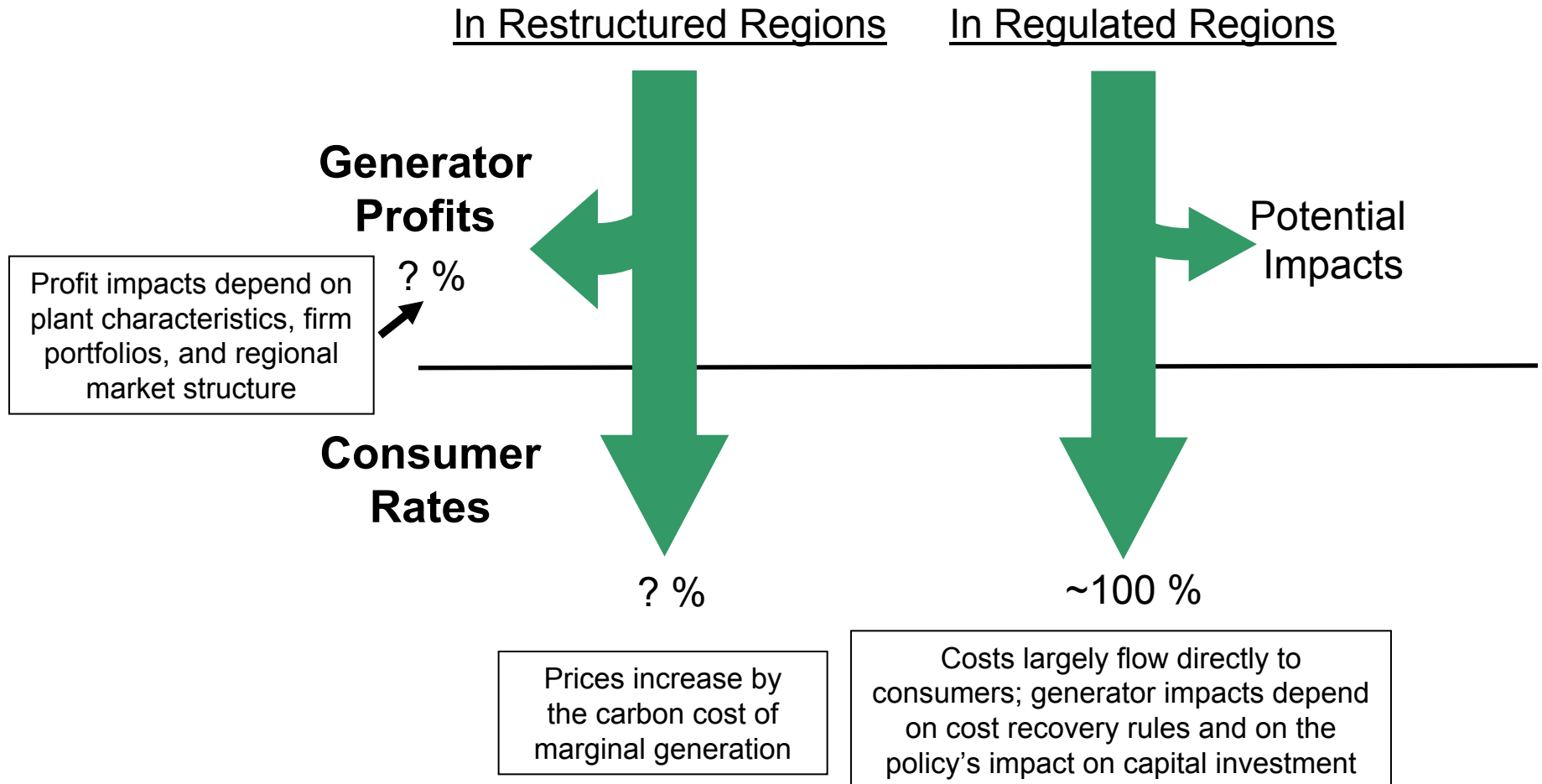
Implications of allocation decisions for aggregate costs: The method of freely allocating allowances

- There is an important difference between allocation methods that fix the distribution of allowances at the outset, and so do not create any incentives...
- And “updating” or conditional allocations that *condition* the distribution of allowances on future operational decisions of allowance recipients
- Incentives created by updating or conditional allocations can be just as (or even more) powerful than the incentives created by the requirement to surrender an allowance for each ton of emissions
- While some of the incentives created by such allocation approaches may be intentional and necessary to achieve desired objectives ...
- Others may be unintentional and can have perverse and costly consequences

Implications of allocation decisions for aggregate costs: The method of freely allocating allowances

- The Lieberman-Warner bill offers an example of a method of allocating allowances in the electricity sector that can have costly consequences
- Shifts in new capacity investments from emitting to non-emitting technologies offer one potentially cost-effective source of emission reductions
- And by placing a cost on emissions, a cap-and-trade system typically creates incentives for new investment to shift toward non-emitting technologies
- But under Section 3902, new fossil fuel power plants will be granted a quantity of allowances in each year that is equal to at least 0.5 tons of CO₂ times their generation (in MWh) in that year
- By contrast, new non-emitting plants will not be awarded allowances
- By awarding allowances to new fossil fuel plants, but not to new non-emitting plants, Section 3902 significantly reduces incentives to shift new investment toward non-emitting generation

Distributional consequences of allocation decisions: Distribution of a cap-and-trade's burdens in the electricity sector



Distributional consequences of allocation decisions: Impacts of a cap-and-trade on generator profitability

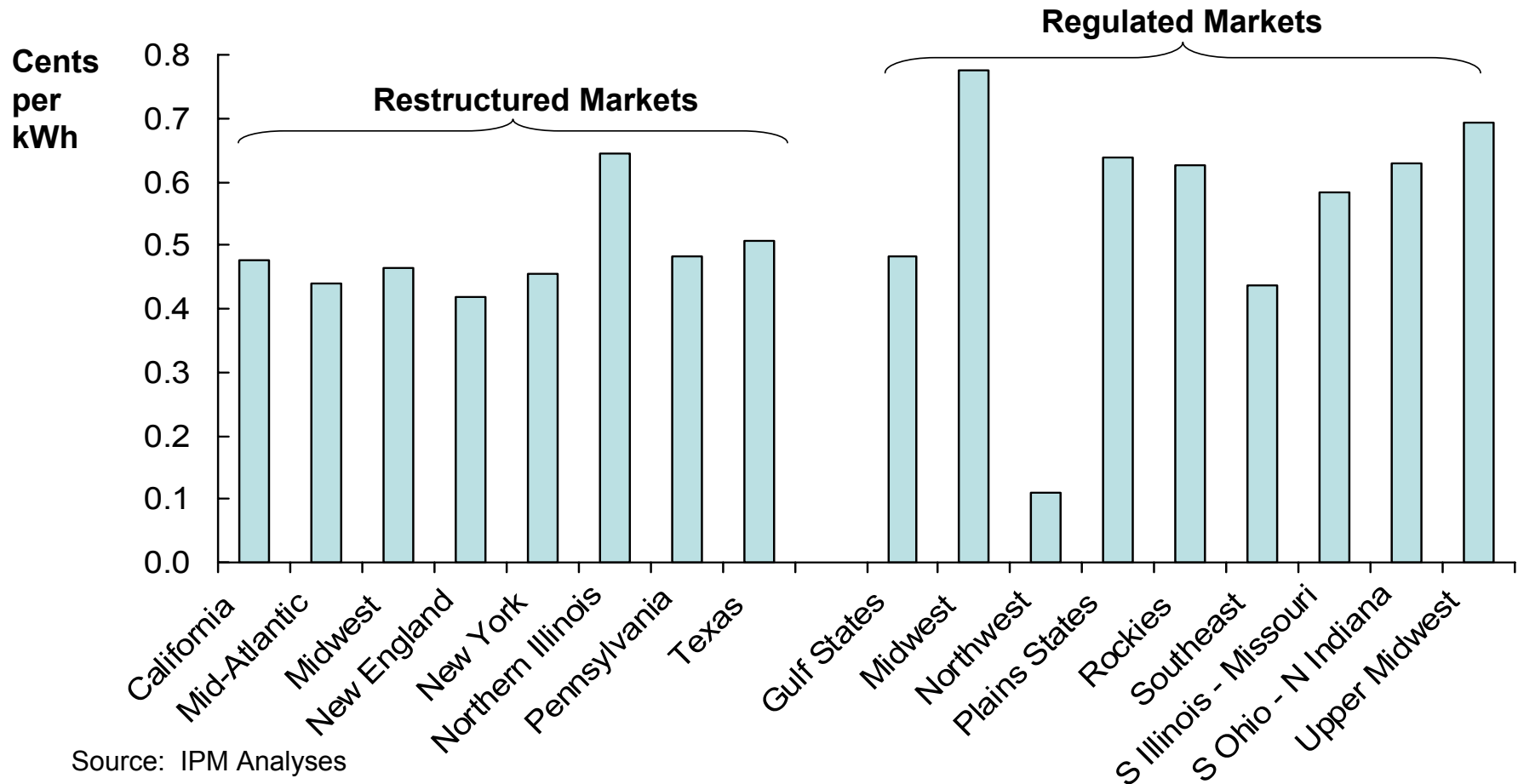
- Despite seemingly definitive statements by some...
- There is significant uncertainty regarding the percent of allowances that would need to be freely distributed to mitigate adverse impacts on generators that face market rates

Distributional consequences of allocation decisions: Impacts of a cap-and-trade on generator profitability (cont.)

- This uncertainty is attributable to several factors:
- It is difficult for models to capture fully the competitive dynamics in electricity markets
- Uncertainty exists regarding how climate policy will affect key determinants of impacts on the profitability of generators
 - Effects on natural gas prices
 - Effects on electricity demand
 - Level of the CO₂ allowance price
- The percent that would need to be freely distributed to avoid adverse impacts on generators also depends on characteristics of the allocation approach
 - Method of allocation (updating versus fixed)
 - Efficiency with which the allocation method targets adversely affected entities
 - Duration of free allocations

Distributional consequences of allocation decisions: Impacts of a cap-and-trade on electricity rates

Electricity Rate Impacts Under a \$7 CO₂ Allowance Price with Full Auctioning



Source: IPM Analyses

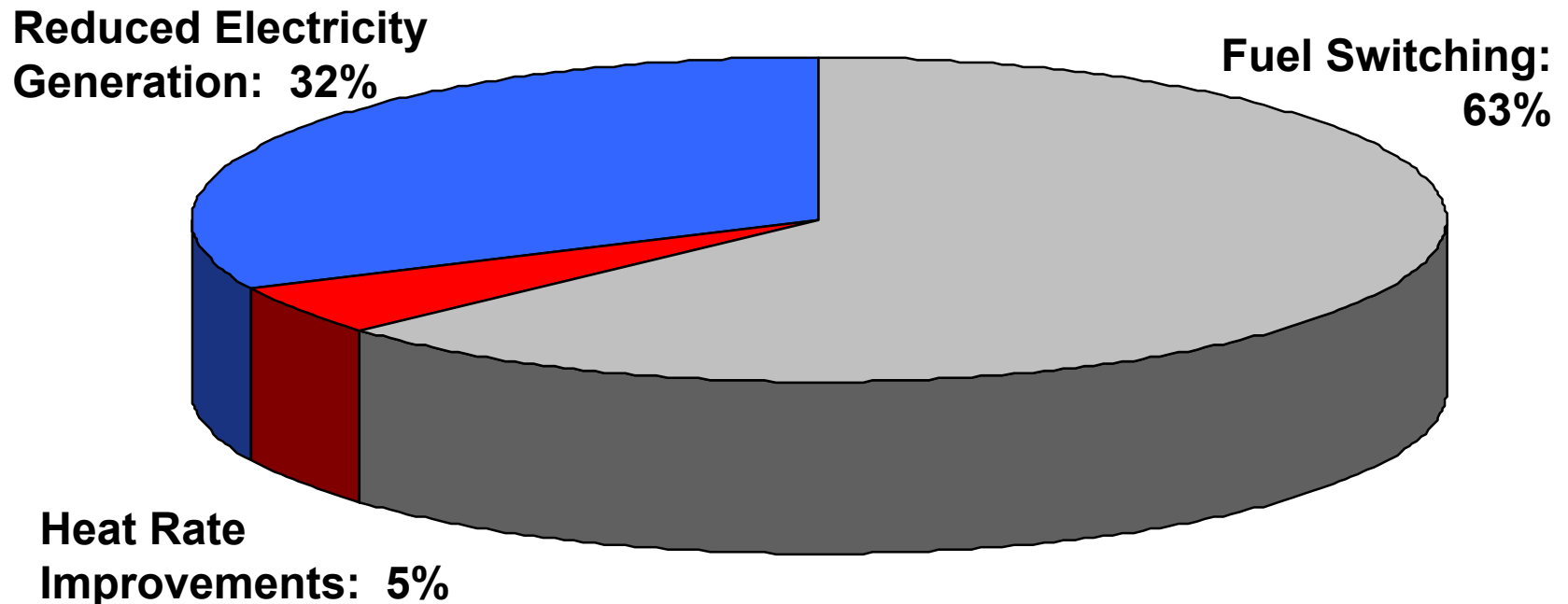
Summary

- The value (or cost) of allowances does not itself contribute to a cap-and-trade's aggregate cost, but that aggregate cost can be affected by how the value of allowances is distributed
- Some uses of this value will have greater economic benefits than others
- The use of allocations to create particular incentives may be intentional and desirable in some cases ...
- In other cases, conditional allocations may unintentionally create perverse and costly incentives

- If one goal of allocations is to mitigate concentrated burdens, it will be challenging to agree on the share of allowances that will be necessary to achieve this goal
- Any such allocations inevitably will need to balance the competing desires of
 - Avoiding under-compensating some
 - And avoiding granting windfalls to others
- But economic analysis can offer valuable insights in designing allocations that better target adversely affected entities

Cost implications of using allowance allocations to mitigate electricity rate impacts

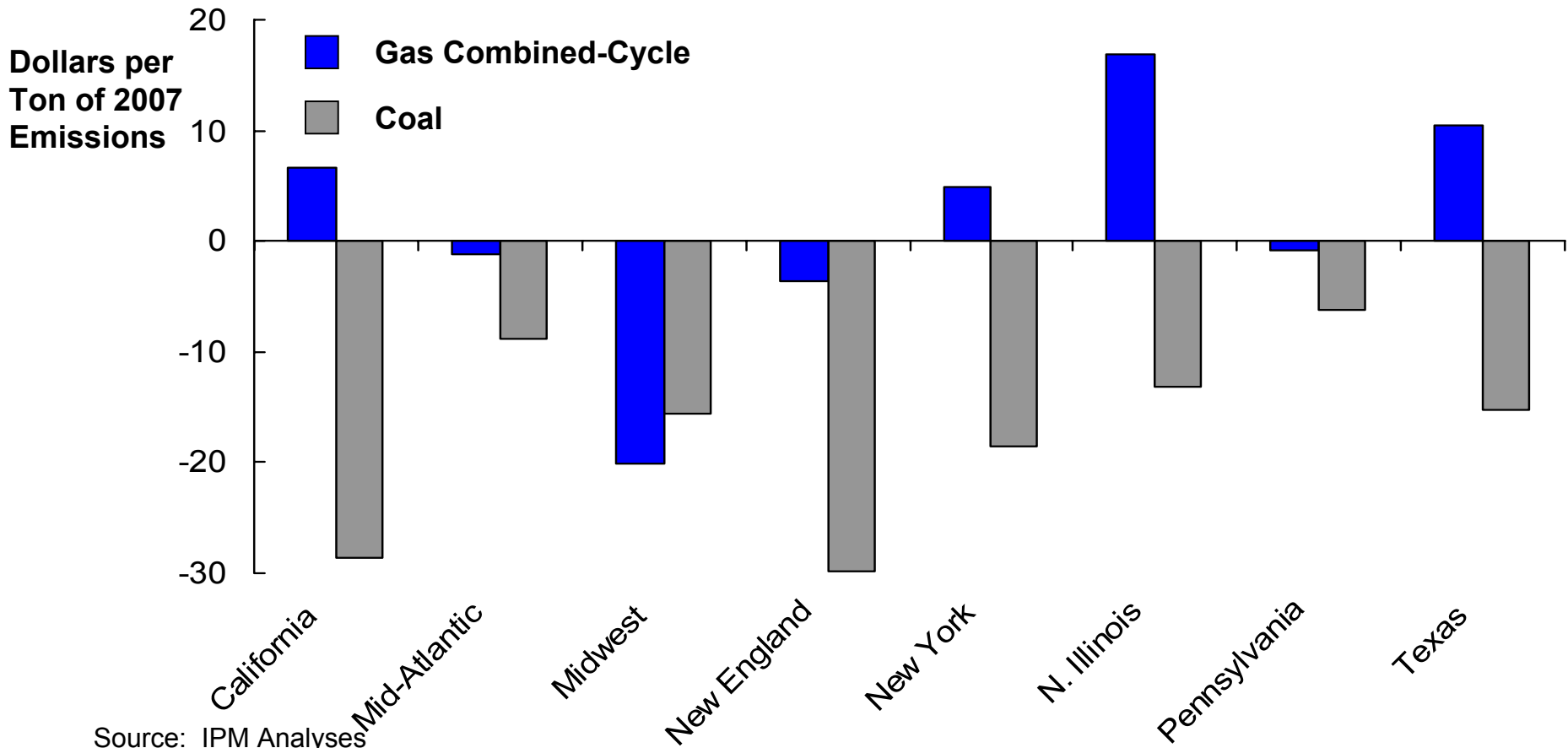
Sources of Electricity Sector Emission Reductions Under a \$7 CO₂ Allowance Price



Source: Burtraw, Dallas, and Karen Palmer. 2007. "Compensation Rules for Climate Policy in the Electricity Sector." Resources for the Future Discussion Paper 07-41.

Relationship between historical emissions and impacts on generator profitability

Average Impacts on the Asset Value of Gas and Coal Power Plants per Ton of 2007 CO₂ Emissions Under a \$7 per Ton Allowance Price



Source: IPM Analyses