

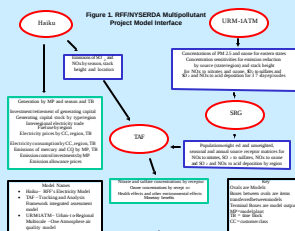
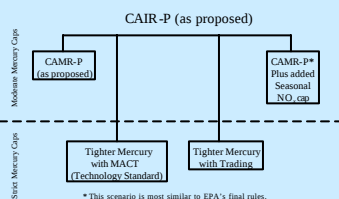
Reducing Emissions from the Electricity Sector: Costs and Benefits Nationwide and in the Empire State

By Karen Palmer, Dallas Burtraw, and Jhih-Shyang Shih

Multipollutant Policy History and Acronyms

- Federal legislation is stalled.
- At least 8 states, including New York, have multipollutant policies.
- EPA recently finalized two new rules:
 - Clean Air Interstate Rule (CAIR) – SO₂ & NO_x in 28 Eastern states
 - Clean Air Mercury Rule (CAMR) – mercury only, national
- Many state officials are eager to see tougher restrictions on mercury emissions and technology based approach is often preferred due to fears about hot spots.
 - Maximum Achievable Control Technology (MACT)

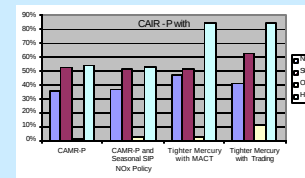
Four Policy Cases Analyzed



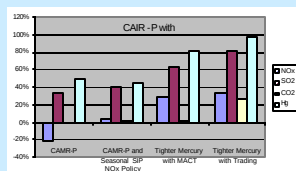
Maintained Assumptions

- Only steam fossil plants install retrofit controls.
- No emissions cap on CO₂.
- Limited restructuring:** Five regions (NY, NE, MAAC, ERCOT, ECAR) with competitive prices and time of day pricing for industrial customers.
- Announced NSR settlements are included as are several state-level multi-pollutant rules. Only partial representation of state-level RPS policies.
- All prices in 1999 real dollars.

National Emission Reductions in 2020

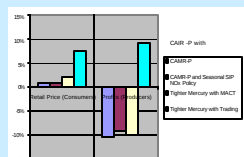


Emission Reductions in New York in 2020



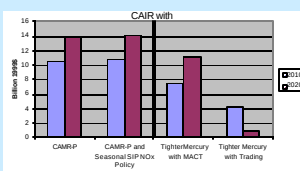
There is greater variation in emissions impacts in New York across policy options.

Price and Profit Effects in 2020



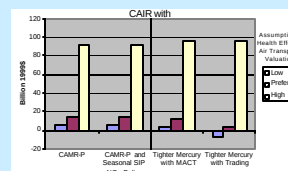
Impact of policies on electricity price is small except with Tighter Mercury with Trading. In that case, electricity price rise is large and producer profits rise.

National Net Benefits by Policy (Benefits minus Costs)



All policies produce positive net benefits in New York and Nation-wide

The Effect of Uncertainties on Net Benefits



Net benefits are positive over a wide range of uncertainties.

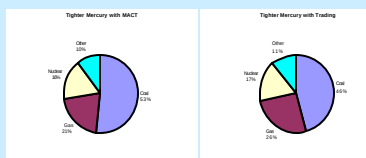
Benefits and Costs Included in Net Benefits Analysis

Benefits		
	Main Analysis	Uncertainty Analysis
Climate Mortality	Yes	Yes
Climate Morbidity	Yes	Yes
Particulate Mortality	Yes	Yes
Particulate Morbidity	Yes	Yes
Visibility	No	Partial
Acid Deposition	No	Partial
Mercury Morbidity	No	Yes
Mercury Mortality	No	Yes
Mercury Ecological	No	Yes
Value of Statistical Life	Lower than EPA	\$1 - \$10 million
Costs		
Electricity Sector	Yes	Yes
Economy-wide	No	No

Evaluation of Final CAIR Rule

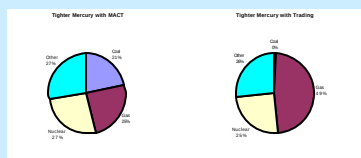
- EPA decision to maintain seasonal NO_x policy in its final CAIR rule improves the net benefits relative to CAIR-P and helps the Northeast.
- However, EPA does not maximize net benefits with final CAIR rule because SO₂ caps could be tighter and provide even higher net benefits.

National Fuel Shares under CAIR-P with Tighter Mercury Caps in 2020



With strict mercury targets, administration goals of promoting market-based policy and preserving a role for coal start to collide.

New York Fuel Shares under CAIR-P with Tighter Mercury Cap in 2020



With strict mercury targets and trading, coal-fired generation virtually disappears in New York by 2020.

Bottom Line

- The reductions in emissions that would be achieved under the EPA final rules or any of the alternatives we investigate offer important economic benefits in excess of costs to the Empire State and to the nation as a whole.

Is CAIR/CAMR the Last Word?

- Economic analysis suggests that the benefits of even further reductions in SO₂ beyond CAIR requirements far exceed the costs.
- Frequent new discoveries about environmental and health effects of mercury are changing the terms of the policy debate.