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“Are There Disparate Air Quality Standards and Are They Distorting Electricity Markets?”

Harvard Electricity Policy Group Plenary Session
High ozone in Northeast during periods of strong wind flow from Midwest and Southeast

Transport vectors on highest 20% of ozone days in the Northeast

Transport vectors on lowest 20% of ozone days in the Northeast
There is a wide disparity in emissions between sub-regions.
CO2 emission rates of top 50 generating companies
SO₂ emission rates of top 50 generating companies
NOx emissions of top 50 generating companies
NOx emission rates of top 50 generating companies
Generation of top 50 generating companies
Emissions contribution of utility sources

**NOx**
- Transportation: 43%
- Electric Utilities: 23%
- Industry: 16%
- Commercial: 2%
- Misc.: 1%

**SO₂**
- Transportation: 3%
- Electric Utilities: 66%
- Industry: 29%
- Misc.: 3%

**CO₂**
- Transportation: 39%
- Electric Utilities: 36%
- Industry: 22%
- Misc.: 12%

**Mercury**
- Other combustion: 52%
- Electric Utilities: 21%
- Industry: 23%
- Misc.: 2%

Are There Disparate Air Quality Standards and are they Distorting Electricity Markets?

- Restructuring needs holistic approach
- Competition can and will lower costs, improve service and stimulate innovation
- Disparate environmental standards skew the market and affect public health
- Need to link energy and environmental policy
80% of power plants are located within 200 miles of ozone nonattainment areas
Upper Atmosphere Transport of Ozone and NOx (ozone 80-120 ppb)

Night (1:00-5:00 AM)  
Sea of Ozone Pollution Flows Throughout the Night in Upper Atmosphere

Ground Level Ozone Remains Stable (40-60 ppb)

Upper Atmosphere Transport

Atmospheric Mixing

Early Morning (5:00-8:00 AM)  
Atmospheric Mixing- "Jump Start" to High Smog Days

Ground Level Ozone Increases (60-80 ppb)
Mid-Day
(9:00 AM-4:00 PM)
Local NOx and VOC
Emissions Produce
Additional Ozone
Pollution

Evening
(5:00-9:00 PM)
Ground Level
Transport "Jets"
Deliver Additional
Ozone Pollution from
the Southeast
and Midwest
CO₂ emissions of top 50 generating companies