

Thinking About Environmental Impacts in Electricity Regulation

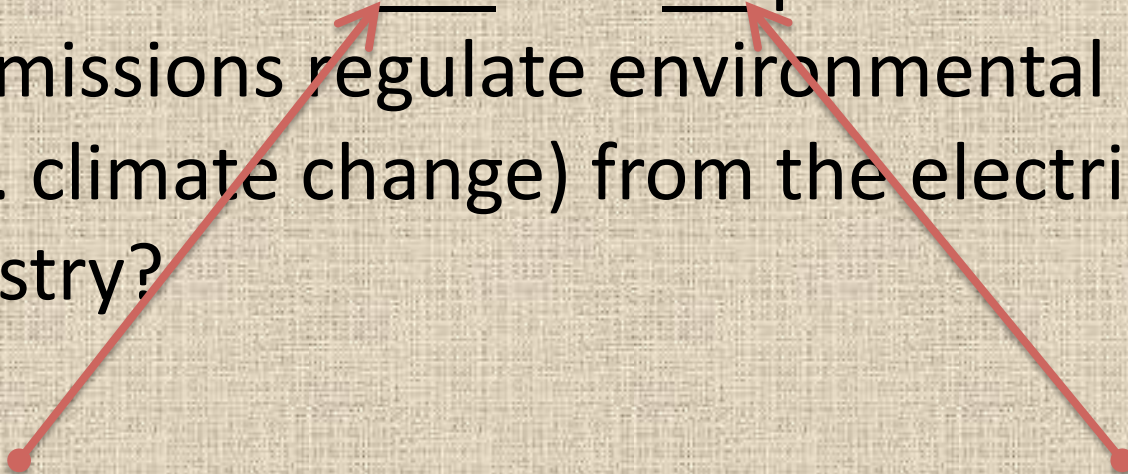
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- To what extent can and do public utility commissions regulate environmental impacts (esp. climate change) from the electricity industry?

Paper 1
(legal analysis)

Paper 2
(case studies)



ELECTRICITY–ENV'T NEXUS

- GHG emissions from electricity generation sector:
 - 35% of U.S. emissions
 - 25% of world emissions
- Value of Damage from CO₂:
 - US DOE: \$21/ton \leftrightarrow UK DOECC: \$83/ton
 - 1000MW Coal Plant (base load) \rightarrow average 18,000 tons/day
 - 18,000 x 21 = \$378,000/day
 - 18,000 x 83 = \$1.5 million/day
- Similar studies for SO₂, NO_x, PM

PUCs control utilities

- Public Utility Commissions have authority over electric utilities'
 1. Rates
 2. Conservation Programs
 3. Energy Procurement
 4. Financing
 5. Merger Decisions
 6. Facility Siting



Can PUCs Regulate Env'tl Impacts?

- METHODS:

- Survey state statutes, PUC decisions, court decisions
→ look for how public interest language is used to decipher legal meaning of “public interest”
- Determine how environmental impacts relate with “public interest”
- Determine significance of this relationship in light of “hard look” doctrine
 - Hard look doctrine: Must consider all material facts and issues in [“public interest”] analysis → or else decision overturned

Can PUCs Regulate Env'tl Impacts?

- Statutory Sampler: PUCs must ensure utilities' actions are...
 - “just and reasonable” (rates)
 - “in the public convenience and necessity” (siting)
 - “consistent with the public interest” (mergers)
 - “in the public interest” (interconnection)
 - an “enhancement of the state’s socioeconomic fabric” (siting)
 - consistent with “any other issue the PUC chooses to consider” (resource planning)

Can PUCs Regulate Env'tl Impacts?

- Years of agency interpretation + litigation =

1. Minimize Costs to Consumers
2. Ensure Nondiscriminatory Service
3. Ensure Adequate Service

****finding based on 25 statutes and 100+ PUC
and court decisions, and utility treatise

Can PUCs Regulate Envntl Impacts?

- What does the environment have to do with the “public interest”?:
 - (1) cost-minimization
 - (2) nondiscrimination
 - (3) service adequacy

Can PUCs Regulate Env'tl Impacts?

- Cannot minimize electricity-related costs without considering environment-related costs of electricity
 - Ex: Kentucky PUC denies utility's proposed purchase of 100 MW of wind power b/c it would cost \$9/MWh *more* than fossil fuel generators → FAILS cost-minimization principle?
 - CO₂: \$32-\$74/MWh (coal) and \$16-\$37/MWh (nat. gas)
 - SO₂, NO_x, & PM: \$32/MWh (coal) and \$1.60/MWh (nat. gas)
(Nat'l Research Council, 2009):

Can PUCs Regulate Env'tl Impacts?

- Cannot remedy electricity-related **discrimination** without considering electricity-related pollution distribution
 - Ex: downwind community endures acid rain and PM, upwind endures none
 - Should prices be same for all? Or does that amount to discrimination?
 - *FPC v. Sierra Pacific Power Co.*: rates to one customer shall not “overburden” another customer

Can PUCs Regulate Env'tl Impacts?

- Cannot ensure **adequate service** without considering feedbacks of environmental impacts
 - E.g. projected **water shortages** (Sovacool & Sovacool, 2009) → power generation accounts for 39% of all freshwater withdrawals (Feeley & Ramezan, 2003)
 - **Reduced thermal efficiencies** → expected to require additional 14-23% capacity to keep pace with demand, relative to a climate no-change scenario (U.S. Climate Science Program, 2008)
 - **Extreme weather**: railroads (2/3 of coal) along river beds; and plants located at 3' or less elevation.

Can PUCs Regulate Envntl Impacts?

- Conclusion: Relationship

Environment + Public Interest =



Can PUCs Regulate Env'tl Impacts?

- Significance of findings: 'hard look' doctrine?
 - Courts can review agency decisions to ensure a **rational** decision-making process

“The function of the court is to assure that the agency has given reasoned consideration to all the material facts and issues. This calls for insistence that the agency articulate with reasonable clarity its reasons for decision, and identify the significance of the crucial facts Its supervisory function calls on the court to intervene . . . if the court becomes aware, especially from a combination of danger signals, that the agency has not really taken a 'hard look' at the salient problems, and has not genuinely engaged in reasoned decision-making”

(Greater Boston Television Corp. v. FCC)



Can PUCs Regulate Env'tl Impacts?

- So can PUCs regulate environmental impacts, including climate change?
 - **YES**, if there is specific statutory direction (“10% of all energy shall be renewable” or “rates must include costs of electricity to the environment”)
 - **MAYBE**, if there is no specific authority, but there are general ‘public interest’ mandates
 - My finding: PUCs must *explicitly* and *meaningfully* consider environmental impacts in the decision-making process
 - Link w/ Paper 2: RI, MA, & PA all have some specific authority (e.g. RPSs, but NO specific GHG rate authority); all have public interest language

Do PUCs Regulate Envntl Impacts?

- If they **can** regulate environmental impacts, when and to what extent **do** PUCs regulate?

Do PUCs Regulate Env'tl Impacts?

- Comparative Qualitative Case Study
 - Cases: most recent electricity rate cases decided by **Pennsylvania, Rhode Island, & Massachusetts**

| Variation Score | CT | DE | ME | MD | MA | NH | NJ | NY | PA | RI | VT |
|-----------------|----|----|----|----|-----------|----|----|----|-----------|-----------|----|
| Law | 3 | 5 | 3 | 5 | 3 | 3 | 1 | 1 | 5 | 5 | 3 |
| Org'n | 3 | 5 | 0 | 2 | 4 | 2 | 1 | 4 | 5 | 3 | 1 |
| Politics | 3 | 1 | 2 | 2 | 5 | 3 | 4 | 0 | 5 | 4 | 1 |
| TOTAL | 9 | 11 | 5 | 9 | <u>12</u> | 8 | 6 | 5 | <u>15</u> | <u>12</u> | 5 |

- **Law**: 7 Statutory features
- **Organization**: Avg. Commissioner Salary
- **Politics**: LCV scores for state Dems multiplied by proportion of seats held by Dems in state legislature

Do PUCs Regulate Env'tl Impacts?

Dependent Variables:

1. **Environmental outcome** of rate decision (power consumption levels; state CO₂ emissions; incentives created)
2. **Environmental analysis** in rate decision

Independent Variables:

1. **Legal Structure**

- Policy Mandates
- Conservation Mandates
- Resource Planning
- State NEPA
- Nondiscretionary Authority (RPS; RGGI; Disclosure Req't)

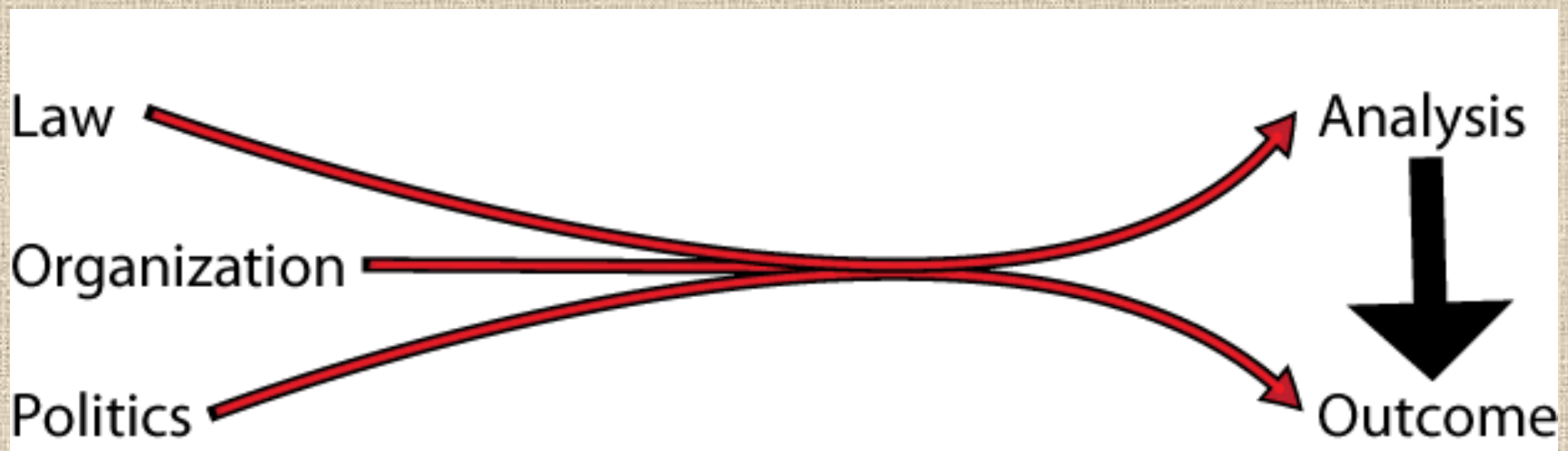
2. **Organizational Structure**

- Professionalization (staff size; budget size; # of industries overseen; educ. & exper.)
- Labor Division
- Coordination Mechanism (how proceedings conducted)

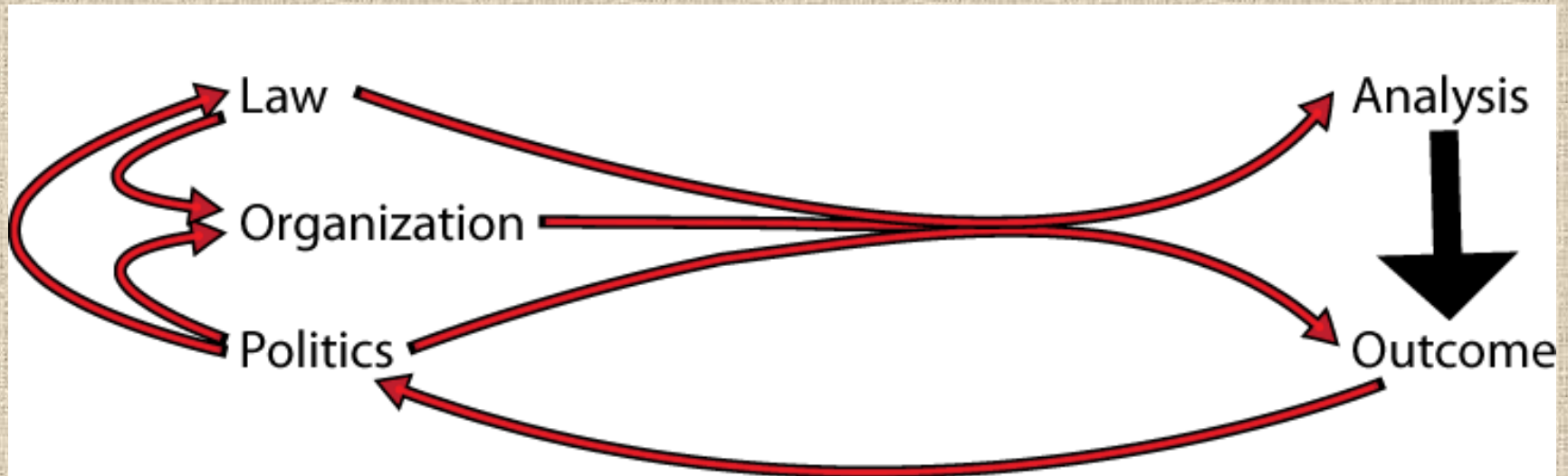
3. **Environmental Politics**

- Interest Group Intervention
- Party Control
- Env'tl Policy Trend (legislative & executive actions)
- Regulatory Resources

Do PUCs Regulate Env'tl Impacts?



Do PUCs Regulate Env'tl Impacts?



Do PUCs Regulate Envntl Impacts?

RESULTS

| ENVTL CHANGES AFTER RATE DECISION | | Penn. | R.I. | Mass. |
|--|-------------|-------|------|-------|
| CO ₂ Emissions Increase from Electricity Sector | | n/a | 4% | 6.1% |
| State Electricity Consumption Increase | Industrial | n/a | -3% | -3.4% |
| | Commercial | n/a | 0.3% | 3.2% |
| | Residential | n/a | 10% | 3.2% |

King & Chatterjee (2003)



Do PUCs Regulate Env'tl Impacts?

RESULTS

| INCENTIVE EFFECTS OF RATE CHANGES | | Penn. | | R.I. | Mass. |
|--|----------------|-----------------------|-----------------------|-------------|------------------|
| | | Wellsboro | Citizens | Narrag. | Nat'l Grid |
| Revenue Decoupling | | N | N | N | Y |
| Bill Increase for 600-kWh Res. Customer | | 26.9% | 37% | 8.1% | -10% |
| Usage-Fee Increase | Residential | 29.7% | 10.1% | 4.3% | 0.3% |
| Fixed Fee Increase | Residential | 10.8% | 60% | 36% | -37% |
| Rate Design Change | Residential | Declining → Flat | Declining → Flat | Flat → Flat | Flat → Inclining |
| | Large Customer | Declining → Declining | Declining → Declining | Flat → Flat | Flat → Flat |

Do PUCs Regulate Env'tl Impacts?

MA > RI > PA

Do PUCs Regulate Env'tl Impacts?

- Question Answered:
 - YES, PUCs regulate GHGs through rates (to different extents) under the following conditions:

| CORRELATIONS w/ GHG REG'N | Positive | Negative | Unrelated |
|------------------------------|---|--|---|
| Law | <ol style="list-style-type: none"> 1. Nondiscretionary envtl protections (Sautter, 2010) 2. State NEPA statute (Sautter & Twaite, 2009; Sautter, 2010) | | <ol style="list-style-type: none"> 1. Policy mandate in enabling statute (Sautter & Switzer, 2008; Sautter, 2010) 2. Resource planning mandate (Sautter, 2010) 3. Conservation mandate |
| Org'n | <ol style="list-style-type: none"> 1. Scientific educ. & experience 2. Agency Transparency (Berry, 1984) 3. # of staff / docket size ratio | <ol style="list-style-type: none"> 1. Commissioner salary (Berry, 1984) 2. # of industries regulated | <ol style="list-style-type: none"> 1. Complexity of labor division 2. Budget size (Berry, 1984) 3. Hearing proxy (Berry, 1984) 4. Yrs of PUC exper. |
| Politics | <ol style="list-style-type: none"> 1. Dem legis. Control (Ardoin & Grady, 2006; Eshbaugh-Soah & Meier, 2008) 2. Dem appt. + more unilateral (Sautter & Sautter, 2010; Hays, 1992) 3. Policy trend toward envtl protection (Chubb, 1983) 4. Environmental interest group intervention (Gormley, 1983; Berry, 1984) 5. Industrial interest group intervention (Berry, 1984; Teske, 2004) | <ol style="list-style-type: none"> 1. Regulatory resources (Berry, 1979; Gormley, 1983) | <ol style="list-style-type: none"> 1. Ratepayer advocate intervention |
| Analysis | <ol style="list-style-type: none"> 1. Length of decision 2. Length of discussion of envtl issues | | |

Further Research

- Confirm ***Causal*** Relationships: statistical analysis of variables

THE END