A Regional Perspective on Utility and Energy Efficiency Policy: Creating Equitable and Sustainable Energy Policies

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The Regulatory Assistance Project

RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP is funded by US DOE & EPA, several foundations, and international agencies. We have worked in 40+ states and 16 nations.

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The Key word this morning is “Momentum.”
Things are happening: RGGI, other State and Regional Programs, and a Federal Climate Program in 2009.
How can Maine government, businesses, and citizens
1. Reduce their risk associated with carbon management, and
2. Be ready to take advantage of this momentum?
Momentum?
Momentum?
Momentum?
Oh, Momentum!
Outline

I. Cap-and-Trade for the Electric Sector:
   The “RGGI” model (Electric Sector), other state and regional initiatives, and a national program (Multi-Sector)

II. Responses to these changes, and implications for development in the energy sector.

III. Conclusions
What is cap-and-trade?

- Establish a **tonnage limit** on an area's emissions (not on each single source)
- Create a **tradable allowance** for each ton under the cap
- Allowances are a **new kind of currency** that emitters subject to the program must acquire
- **Emitters must surrender allowances** that correspond to their emissions in each compliance period
- **Allocation**: the regulator (e.g., EPA or MA DOER) can sell and/or give out allowances
- Existing cap-and-trade programs: Federal Acid Rain and NOx programs, Regional Greenhouse Gas Initiative (RGGI)
The Regional Greenhouse Gas Initiative, RGGI
RGGI Program Components

- Start date of January 1, 2009
- Covers fossil-fired generation ≥ 25 MW
- Three-year compliance periods
- Cap size -- 188,076,976 tons -- based mainly on average 2000-2002 aggregated historical CO₂ emissions
- Two-phase cap: stabilize emissions through 2014 (i.e., compliance periods 1 and 2); reduce 10% by 2018 (end of period 3)
- Comprehensive program review in 2012
Program Components Cont.

- Regional **Allowance Auction**.
- **Consumer/Strategic Benefit Allocation**:
  - Minimum 25% allocation for Consumer Benefit and/or Strategic Energy Purpose, as defined in MOU (e.g., support end-use energy efficiency or promote IGCC).
  - Remaining 75% allocated at discretion of each state.
  - States comprising majority of regional emissions budget have committed to use most of allowance budget to support consumer benefit programs.
- Banking allowed (no limit).
Offsets—project-based reductions:

Types:
- Natural Gas, Oil, Propane End-use Energy Efficiency
- Afforestation
- Landfill Gas Capture & Combustion
- Methane Capture & Combustion from Animal Manure Management Operations
- SF$_6$ Leak Reduction -- Electricity Transmission & Distribution
- International carbon currencies under limited circumstances (CDM)
Cap-and-Trade: The Bottom Line

NOTE: RGGI has taught us that a cap-and-trade program for carbon dioxide – due to certain factors -- needs to be designed differently in certain respects than the EU ETS, and the US Acid Rain and NOx programs.

There are three main ways to reduce CO$_2$ emissions:

- Re-dispatch the existing fleet
- Reduce consumption
- Lower the emission profile of new generation (including repowering)

For each opportunity, ask:

1. How many tons will it avoid?
2. How much will it cost consumers per ton?
3. What tools (including what kind of carbon cap) get the best results on #1 & #2?
The Consumer Allocation

- Allocate up to 100% of initial credits to consumer representatives (eg, distribution utilities, Efficiency Utility)
  - RGGI MOU - state minimum commitment is 25%
  - Most states will be higher – Vermont law is 100%; NY & MA draft rules now at 100%; CT, NJ, MD follow
- Generators need to purchase allowances, recycling the windfall revenue BACK to consumers
- PUCs supervise use of the $$ for benefit of consumers
- Best result: focus these $ on investments that lower carbon (EE &RE)
- Results: lower cost per ton avoided, lighter macro-economic impact >> quicker progress in reducing GHG emissions
Why Have a Consumer Benefit Allocation?

• RGGI program to be implemented in deregulated wholesale electricity market

• Compliance costs of marginal unit incorporated into wholesale market clearing price, regardless of allocation method (i.e., free distribution or auction)

• CO₂ allowances analogous to a marginal O&M cost

• Generators “expend” allowances when generating electricity, resulting in forgone revenue that could be received through sale of allowances (“opportunity cost”)

• As a result, market price of allowances factored into generator bids into the wholesale market
Maine’s allocation of RGGI auction allowances

- 88% of Auction Proceeds Earmarked for Energy Efficiency, unless allowance prices exceed $5. In that case, excess revenue raised must be returned to ratepayers as rebates.

- 10% will go to incentives for combined heat and power (CHP) facilities at integrated manufacturing facilities.

- 2% portion of allowances will go to Voluntary purchase of Renewable Energy Certificates (VREC).
Efficiency programs are more powerful than rate increases

- Economic theory: just raise the price of power
- DSM reality: Programs are needed to surmount market barriers to efficiency
- Utility DSM experience: $ spent through smart programs will deliver 7x to 13x the efficiency savings of $ charged in higher prices
- Key conclusion: Build efficiency support into program architecture.
Efficiency programs can save 7x more carbon per $ than carbon taxes

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**Annual CO₂ Emissions Saved by: Increasing Rates 3%; and Increasing Rates 3% to Fund Energy Efficiency (Ohio Example)**

Assumptions:
- Electricity use increases by 1.7% per year;
- Retail electric sales increase by 3%;
- Price elasticity is -0.25 (-0.75 for a 3% increase), distributed over 5 years;
- Carbon dioxide emissions are 0.915 tons per MWh in Ohio;
- Cost of EE is 3 cents per kWh;
- Average EE measure life is 12 years.

Cumulative CO₂ emissions avoided from raising rates 3% and funding EE, 2006-2026: 1,557 million tons

Cumulative CO₂ emissions avoided from raising rates 3%, 2006-2026: 209 million tons

NE-ISO Average Monthly Price

Delivered Cost of Wholesale Power *
Wholesale Spot Market Price
Efficiency Vermont, Contract Price

Efficiency Savings:
from 1 cent/KWh (Jan 2002), to more than 6 cents/KWh (Jan 2004).
Efficiency is the low-cost “carbon scrubber”

U.S. Mid-Range Abatement Curve – 2030

Source: McKinsey analysis
Note: The McKinsey report only examines a scenario through 2030. NRDC recommends a goal of 80 percent emissions reductions by 2050.
Buildings represent a large fraction of CO2 reduction potential.
Good news: LSE-based EE programs are more powerful than rate increases

- Economic theory: just raise the price of power
- DSM reality: *Programs* are needed to surmount market barriers to efficiency
- Utility DSM experience: $ spent through smart programs will deliver 5x to 13x the efficiency savings of $ charged in higher prices
- Key conclusion: Build efficiency support into cap and trade program architecture.
Other State and regional power sector carbon caps

Midwestern GHG Accord
6 states & 1 province

California & Oregon

Western Climate Initiative – 6 states & 2 provinces

RGGI - now 10 states

Together, their carbon profiles exceed most nations.
1. To moderate generator windfalls and lower the cost-per-ton-avoided: auction allowances or allocate them to distribution utilities (i.e., to power buyers, not sellers).

2. Dedicate auction revenues to investments in end-use efficiency.

3. Focus on “portfolio-up” policies (e.g., RPS & EPS) not “price-down” policies for power sector GHG reduction.

4. Allocate allowances to states on a performance basis to support these policies.
Section I Conclusions: mobilize efficiency

- Cap-and-trade design can tap the carbon value of efficiency.
- A carbon program that directly mobilizes end-use efficiency will cost less and achieve more than one that focuses only on smokestacks.
- Lower cost attainment. Isn’t that the whole point of cap-and-trade in the first place.
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Other things that can be done that are consistent with climate regulation

1. Make Efficiency Profitable for Utilities
2. Integrated Resource Planning or Portfolio Planning
3. Promote Efficient Buildings
5. Watch out for “Risk Shifting”
Make Efficiency Profitable for Utilities

- Utilities have many fixed costs, and rates often exceed marginal production costs:
- Extra sales are profitable to utility
- Needed: rate policies to make efficiency profitable to utilities
- “Decoupling” seeks to break the link between revenues and energy sales.
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At least 28 states have IRP or PM processes in place, with 6 more now under review.
Vermont statute:
A "least cost integrated plan" for a regulated electric or gas utility is a plan for meeting the public's need for energy services, after safety concerns are addressed, at the lowest present value life cycle cost, including environmental and economic costs, through a strategy combining investments and expenditures on energy supply, transmission and distribution capacity, transmission and distribution efficiency, and comprehensive energy efficiency programs.

“Rip Van Winkle” law in many states since 1994
- Time to wake up!

In restructured states, the issue is Default Service (or Standard Offer Service, Basic Service)
- Efficiency down, consumer risk way up! (Maryland, Mass, etc)
- Portfolio Management needed for those providers
- Legislative oversight hearings might be useful here
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Promote Efficient Buildings, and Efficient Public Buildings

- 46 states permit performance contracting in some part of the “public sector” (variously defined)
  - Schools, colleges doing a bit better
  - Most state gov’t buildings still way behind
  - Correctional facilities – the biggest energy users in state government

- Purchasing rules still get in the way:
  - E.g., 3-year maximum contract
  - Taking the energy savings back from the agency’s operating budget
What is needed?

1. Collecting, evaluating energy use data for public facilities – most states do not do this

2. Model agreements, bundling of projects to attract Energy Service Company (ESCO) financing

3. A state government entity to promote performance contracting, help agencies and facility managers (state-level version of Federal Energy Management Program)

   http://www1.eere.energy.gov/femp/
Public Buildings (cont.)

- Example: Iowa Energy Independence Fund
  - Consortium of state agencies issues bonds and supervises EE contracts for individual agencies.

- Another idea: New buildings built with public support should be at least 30% better than code, up to +50% over time
Using tax incentives for building efficiency

- Tax deduction for expenses up to $1.80/sf for EE in commercial buildings.

- Deductions for lighting up to $.60/sf for up to 50% above ASHRAE standards
  - This gives a big boost to lighting switchouts, and could be leveraged by states to accelerate progress.
Challenges and needs in low-income housing

- Low-income housing: often least efficient, older, most in need of retrofit
- But market barriers to efficiency are greatest
- Important target for Environmental Justice advocates
- Federal Weatherization Assistance Program (WAP):
  - Provides about $200 million/year
  - Treats ~ 100,000 units/year
    - Note: metric is # units treated, not amount of fuel saved
  - Unmet need is 20 to 30 million units!
Weatherization benefits

- Weatherization has multiple benefits:
  - Weatherization reduces average heating bills by 31% and energy bills by $358 per year (2007 prices – more in 2008).
  - Lower bad debt write-offs for utilities
  - Lower fuel assistance payments
  - Lower peak loads and utility costs
  - Water and sewer savings
  - Fire safety
  - Health and comfort, indoor air quality
  - Environmental benefits – avoided emissions
  - Local employment, and other benefits

- Full benefits double the value of the program
- Benefit/cost ratio is 3.7 to 1 <ORNL study>
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Regulatory policies to accelerate low-carbon generation

Direct regulatory tools are also needed

- Renewable Portfolio Standards
- Contracting rules & Emission Performance Standards
- Interconnection rules, net metering for DG
- Siting and cost recovery policies to develop and deploy essential new low-carbon generation (esp. carbon capture and sequestration)

Many possibilities lie within the portfolio management functions of electric service providers – and scope of utility regulation.
Renewables Portfolio Standard

- An RPS ensures that a minimum amount of renewable energy is included in the portfolio of an electricity company providing retail service.
- An RPS can be used in a traditionally-regulated or a restructured market.
Benefits of an RPS

- Environmental improvement (e.g., avoided air pollution, global climate change mitigation, waste reduction, habitat preservation, conservation of valuable natural resources).

- Increased diversity and security of energy supply.

- Lower natural gas prices due to displacement of some gas-fired generation or a more efficient use of natural gas due to significantly increased fuel conversion efficiencies.

- Reduced volatility of power prices, if regulatory authorities acknowledge stable or non-existent fuel costs for renewables.

- Local economic development resulting from new jobs, taxes, and revenue associated with new renewable capacity.

- Because it is a market-based program, an RPS also has several operational benefits:
  - Achieves policy objectives with relative efficiency.
  - Spreads compliance costs among all customers.
  - Minimizes the need for ongoing government intervention.
  - Provides a clear and long-term target for renewable energy generation that can increase investors’ and developers’ confidence in the prospects for renewable energy.
RPS and Cap-and-Trade

- An RPS and cap-and-trade program have consistent goals.
- They both promote a cleaner generation profile in the relevant area, e.g., the RGGI Region, or the state that has adopted an RPS.
- RPS and cap-and-trade likely to have slightly different economic effects.
Other things that can be done that are consistent with climate regulation

1. Make Efficiency Profitable for Utilities
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5. Watch out for “Risk Shifting”
Watch out: **Risk-shifting** by utilities is **not risk reduction** for consumers or the environment

- **A “moral hazard”** arises when a decision-maker is insulated from the consequences of his choice because someone else will bear the risk and pay the resulting costs.
  - E.g., recent debate whether to risk creating a moral hazard through government bail out of high-risk mortgage lenders

- Utility regulation offers many arcane methods to hide or shift risks:

- **E.g., Fuel Adjustment Clause:** “The Commission **shall** permit an electric public utility to charge an increment or decrement as a rider to its rates for changes in the cost of fuel and fuel related costs <including>
  - The cost of fuel burned…
  - The cost of emission allowances as used, **including allowances for carbon equivalent greenhouse gas emissions**…”
    --Proposed legislation, from Committee Substitute, S3 (North Carolina) June 2007 (emphasis added)
Utility risk-shifting strategies for high-carbon resources

Many strategies in play today:
  - Free allocation of carbon credits on an historic basis
  - Regulatory pre-approval
  - “Rolling prudence” filings and reviews for high-carbon resources
  - Automatic recovery of environmental compliance costs
  - Automatic recovery of carbon credit costs

Ratepayers should bear these risks only when part of a package after all lower-cost solutions have been exhausted.
Conclusions

- Carbon responsibility, and carbon risk, are real, substantial, and growing.

- **Energy efficiency** is the essential “bridge fuel.”
- Look to **new generation capacity**, and accelerate the transition with explicit policies for low-carbon resources (e.g., RPS).

- **Rediscover, update IRP** and Portfolio Management for Load Serving Entities.
- Regulators should implement **utility-based policies for clean generation** resources
- **Promote a new business model for load-serving utilities.** (Decoupling, performance-based regulation, owned distributed generation, etc.).

- Strengthen **utility-sector energy efficiency** programs, and expand them to **whole buildings/all fuels**.
- Build **delivery systems** that focus on the low-income housing stock.
- **Implement cap-and-trade** to promote investments in EE, esp for low-income housing stock.

- **Risk-shifting** is not a substitute for **risk reduction**
- **Promote** state and national **utility policies** that support these goals (e.g., rate design for EE, make EE profitable, avoid shifting carbon risk to customers, etc.)

- Assist Congress to build efficiency into **federal climate legislation**.
- **Congress should help states** deliver low-carbon resources through portfolio-based policies.
Are You Ready to Catch the Carbon Management Wave?
Questions?

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