Climate Regulation in the United States

Karen Palmer
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Five years ago next Thursday, Waxman Markey passed in the US House of Representatives.

History was almost made.

Then...

- The Senate failed to consider the proposal.
- Cap and trade was declared dead in the press.

Meanwhile, US climate policy proceeded to unfold in other venues and in other forms.
Policy making at many levels of government

- Local governments
  - Climate Action Plans
  - Climate and Energy Efficiency challenges
- State governments
  - RPS, EERS, Low carbon fuel standards
  - State (CA) and regional (RGGI) cap and trade
- Federal government
  - Focus on the Clean Air Act
GHG Regulation under the Clean Air Act

2001  President Bush decision not to regulate power plant CO$_2$ emissions

2007  *Mass v. EPA* – Supreme Court affirms EPA authority to regulate under Clean Air Act

2009  *Endangerment* and *Cause or Contribute* Findings

2010  Settlement Agreement Between State Petitioners, Environmental Petitioners, and EPA

2011  (I) Mobile source standards -- 5%/yr improvement to 35.5 mpg fleet avg. in 2016; 54.5 mpg by 2025

2011  (II) Construction permitting -- implementation by the states

2014  (III) Stationary sources -- performance standards for new and existing (proposed) electricity generators
Why Regulate the Power Sector through the Clean Air Act?

President Obama, State of the Union Address, February 12, 2013:

But for the sake of our children and our future, we must do more to combat climate change....I urge this Congress to get together, pursue a bipartisan, market-based solution to climate change, like the one John McCain and Joe Lieberman worked on together a few years ago. But if Congress won’t act soon to protect future generations, I will. I will direct my Cabinet to come up with executive actions we can take, now and in the future, to reduce pollution, prepare our communities for the consequences of climate change, and speed the transition to more sustainable sources of energy.
Background: Clean Air Act Section 111

Section 111 of the CAA establishes the process by which EPA is to develop standards of performance for stationary sources of air pollution

- **Section 111(b)** addresses new, modified and reconstructed sources
  - Section 111(b) establishes a national new source standard

- **Section 111(d)** addresses existing sources
  - Required once EPA has adopted a 111(b) standard for a source category
  - 111(d) regulation has two parts:
    1. Establishing emission standards using the Best System of Emissions Reductions (BSER) that has been “adequately demonstrated.”
    2. Approving & monitoring state compliance plans for achieving the standards.

- **Important features:**
  - BSER targets are developed at the state level
  - States develop compliance plans, subject to EPA approval and monitoring
  - The rule outlines various acceptable compliance plans (State Plans), including the possibility of states working together in regional plans
  - **BSER and State Plans are logically distinct**, and State Plans need not use BSER methods.
### BSER: Building Block Technologies Translated to State Goals

<table>
<thead>
<tr>
<th>Technology/Building Block</th>
<th>Proposed Option 1</th>
<th>Alternative Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Heat rate improvement (Avg. Reduction for Coal)</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>2. Dispatch to existing and under-construction NGCC</td>
<td>Utilization of NGCC up to 70% capacity factor</td>
<td>Utilization of NGCC up to 65% capacity factor</td>
</tr>
<tr>
<td>3. Dispatch to new clean electric generation</td>
<td>Includes new nuclear generation under construction, moderate deployment of new renewable generation, and continued use of existing nuclear generation</td>
<td></td>
</tr>
<tr>
<td>4. Demand-side Energy Efficiency (% reduction in demand from BAU MWh sales)</td>
<td>3.0% / 10.7% (2020 / 2030)</td>
<td>2.4% / 5.2% (2020 / 2025)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goal</th>
<th>Proposed Option 1</th>
<th>Proposed Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average nationwide goal for covered sources (lbs/MWh)</td>
<td>25% to 30% below 2005 levels</td>
<td>20% to 25% below 2005 levels</td>
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</tbody>
</table>

The BSER is applied to state-specific data (e.g., existing generation mix) to set state-specific emission rate goals.

*Slide adapted from Council of Economic Advisor’s slide deck*
<table>
<thead>
<tr>
<th>State</th>
<th>Interim Goal (2020-2029)</th>
<th>Final Goal (2030 - )</th>
<th>State</th>
<th>Interim Goal (2020-2029)</th>
<th>Final Goal (2030 - )</th>
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<tbody>
<tr>
<td>Alabama</td>
<td>1,147</td>
<td>1,059</td>
<td>Montana</td>
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<td>1,771</td>
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<td>Nebraska</td>
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<td>910</td>
<td>New Hampshire</td>
<td>546</td>
<td>486</td>
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<td>California</td>
<td>556</td>
<td>537</td>
<td>New Jersey</td>
<td>647</td>
<td>531</td>
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<td>Colorado</td>
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<td>Connecticut</td>
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<td>635</td>
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<td>Delaware</td>
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<td>1,077</td>
<td>992</td>
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<td>Florida</td>
<td>794</td>
<td>740</td>
<td>North Dakota</td>
<td>1,817</td>
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<td>Georgia</td>
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<tr>
<td>Kansas</td>
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<td>South Dakota</td>
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<td>Kentucky</td>
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<td>Texas</td>
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<tr>
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<td>Virginia</td>
<td>884</td>
<td>810</td>
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<td>Michigan</td>
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<td>Minnesota</td>
<td>911</td>
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<td>Wisconsin</td>
<td>1,281</td>
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<td>Mississippi</td>
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<td>Missouri</td>
<td>1,621</td>
<td>1,544</td>
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</table>
Formulating State Plans for Compliance

- Policy is implemented by the States
  - State plans due to EPA by 2016 (1 yr. extension allowed)
  - Compliance period begins in 2020

- Multiple pathways for States
  - Rate-based or mass-based standard
  - Trading is possible but up to states
  - Must show equivalence to BSER

- States encouraged to work together
  - Multi-state budget programs allowed
  - Two-year deadline extension for multi-state plan
Anticipated Outcomes of EPA’s Proposed Rules

EPA’s internal analysis finds the following:

- Power sector CO₂ emissions fall 25-30% below 2005 levels in 2025 – a reduction of 18-25% relative to business-as-usual baseline.
- Monetized benefits (3% discount) of B$35 - 58 in 2020 & B$58 - 93 in 2030
- Total Compliance costs are $6-9 billion; average costs of $11-20 per ton CO₂

RFF Analysis of rate-based standards (prior to release of proposal)

- Can be used to achieve substantial emissions reductions
- Can be relatively cost-effective
- Can have a small effect on electricity price (less than 2% in 2020)

But states are allowed to use different approaches to achieve EPA’s state-level CO₂ emissions rate targets. What happens then?
A Single National Rate-Based Policy versus 4 Regional Policies

One Region (TPS policy)
Emissions Reductions = 400 mty in 2020

Four Regions (3 capped regions and one large TPS policy region)
Emissions Reductions = 352 mty in 2020

- Output subsidy in TPS region attracts investment & generation driving up emissions
- Greater electricity transmission from TPS to budget regions
- Emissions in budget regions are capped; generation falls and emissions intensity up

Cost-effective design may require coordination.
Consequences of mass-based trading-region aggregation with mixed policies

- Average (weighted) allowance price falls
- Social cost of policy falls
- Coal & total generation rises in upper Midwest, falls in averaging regions (Ohio Valley)
  - Trading is relevant in electricity and compliance market
  - Allowance price decline makes emissions cheaper in upper Midwest
  - More generation in upper Midwest
  - SO$_2$ emissions increase, shift to upper Midwest

Electricity price, sharing of costs between producers and consumers varies by region depending on market structure
Concluding Observations

- EPA’s Clean Power Plan proposal defines state by state standards, requires state-level compliance plans but allows great flexibility in regulatory approaches.

- A tradable emissions rate approach will limit electricity price impacts but budgets are possible and existing regional/state cap and trade will be accommodated.

- Regional coordination in compliance market can lower overall social costs.

- Regional differences in generation mix can emerge from varying extent of coordination.

- “Other environmental outcomes (SO₂)” can be affected.
To learn more

1. Read numerous blog posts on the RFF blog (common-resources.org).


3. Take a deep dive into the details of the proposed rule on the epa.gov website.

Thank you!