The Regional Impacts of a CES

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RFF CLEAN ENERGY STANDARD WORKSHOP
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About the Bipartisan Policy Center

The Bipartisan Policy Center (BPC) is a non-profit organization that was established in 2007 by former Senate Majority Leaders Howard Baker, Tom Daschle, Bob Dole and George Mitchell to develop and promote solutions that can attract public support and political momentum in order to achieve real progress. The BPC acts as an incubator for policy efforts that engage top political figures, advocates, academics and business leaders in the art of principled compromise.
The BPC Energy Project

On April 12th, BPC launched its new Energy Project led by former Senators Trent Lott, Byron Dorgan, former National Security Advisor General Jim Jones (ret.), and former EPA Administrator William Reilly.

Project Goals

• Encourage substantive, bipartisan dialogue among key interest groups and decision makers on national energy goals and strategies;
• Engage and shape near-term (pre-2012 election) energy policy agenda.
• Develop consensus recommendations to guide national energy policy post-2012 elections.
The Administration’s CES Proposal

- Achieve 80% of electricity from “clean” energy by 2035
  - Renewables, nuclear, coal with CCS, and “efficient natural gas”

- Few details, but includes the following goals:
  - Promote efficiency through complementary policies
  - Protect consumers
  - Ensure regional fairness
  - Promote development and deployment of new technologies
Overview of BPC’s CES Analysis

- BPC has conducted analysis of a CES consistent with the President’s proposal, using ICF International’s Integrated Planning Model (IPM®)
  - Assumes eligible resources consistent with existing CES proposals (renewables, nuclear, and coal with CCS), as well as incremental and new natural gas combined cycle generation at 0.5 credit
  - Assumes gradual increase in CES requirement through 2035
  - No alternative compliance payment
  - Efficiency not included as an eligible resource
- Where possible, treatment of existing generation based on earlier CES proposals
- Included a sensitivity case that reflects forthcoming EPA regulations, as well as a low gas price case
**Definition of qualifying resources and treatment of existing generation has distributional implications**

- BPC assumes credits are awarded to technologies as follows:

<table>
<thead>
<tr>
<th>Technology</th>
<th>Treatment Under BPC CES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar, wind, geothermal, dedicated biomass, and other non-hydro renewables</td>
<td>Existing and incremental/new</td>
</tr>
<tr>
<td>Biomass co-firing</td>
<td>Existing and incremental/new</td>
</tr>
<tr>
<td>Hydropower/MSW</td>
<td>Existing excluded from baseline; credit for generation from incremental/new capacity</td>
</tr>
<tr>
<td>Advanced coal with CCS</td>
<td>New or retrofit</td>
</tr>
<tr>
<td>Nuclear</td>
<td>Credit for generation from incremental/new capacity</td>
</tr>
<tr>
<td>Efficient Natural Gas (NGCC)</td>
<td>Credit for incremental generation (above baseline levels) and new capacity</td>
</tr>
</tbody>
</table>
Key National Results
Projected Generation Mix, 2020 and 2030

- Other
- Dedicated Biomass
- Other Renewables
- Wind
- Hydro
- Nuclear
- Other Oil/Gas
- CT
- NGCC
- Coal with CCS
- Biomass Co-firing
- Conventional Coal
Projected CES Credit Price

The graph shows the projected CES credit price from 2013 to 2029. It includes three scenarios:
- CES
- CES_EPA
- CES Low Gas
Regional Impacts
Net Credit Position by Region, 2020

The bar chart illustrates the Net Credit Position by Region for the year 2020. The x-axis represents CES Generation (GWh) in increments of 20,000, ranging from 0 to 200,000. The y-axis shows CES Generation (GWh) ranging from 0 to 200,000. Different regions are indicated by color-coded bars, representing various energy sources such as Biomass, Other Renewable, Wind, Nuclear, NGCC, and Biomass Cofiring. Each bar indicates the CES Requirement for each region. The chart provides a visual representation of the energy generation and credit positions across different regions.
Net Credit Position by Region, 2030

The regional impacts of a CES generation (GWh) by major renewable energy sources, with CES Requirement indicated.
Cumulative Coal Plant Retirements, 2030

- Reference Case
- CES
Cumulative Capacity Additions, 2030

- MW

- Biomass
- Other Renewable
- Wind
- Nuclear
- NGCC
- Coal with CCS
Electricity Price Impacts will Depend on a Number of Factors

- Electricity market structure
  - Cost of service regions: depends on change in production costs and net credit position of the region
  - Competitive regions: depends on impact of clean energy premium relative to change in marginal cost of generation
- Mix of existing generation resources
- Market and physical conditions for further clean energy development
- Note that electricity price impacts under a CES will tend to be equalizing, i.e., smaller changes or decreases in regions with high prices, and larger increases in regions with low prices
## Projected Retail Electricity Price Impacts

<table>
<thead>
<tr>
<th>Region Name</th>
<th>NERC Region</th>
<th>Regulatory Status</th>
<th>Projected Average Rate Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2013 to 2020</td>
</tr>
<tr>
<td>Northeast</td>
<td>NPCC</td>
<td>Mix</td>
<td>-3%</td>
</tr>
<tr>
<td>Mid-Atlantic</td>
<td>RFC in PJM</td>
<td>Mix</td>
<td>7%</td>
</tr>
<tr>
<td>Southeast</td>
<td>SERC (non-Delta)</td>
<td>Regulated</td>
<td>6%</td>
</tr>
<tr>
<td>Florida</td>
<td>Florida</td>
<td>Regulated</td>
<td>1%</td>
</tr>
<tr>
<td>Gulf Coast</td>
<td>SERC Delta</td>
<td>Regulated</td>
<td>7%</td>
</tr>
<tr>
<td>Southern Plains States</td>
<td>SPP</td>
<td>Mix</td>
<td>1%</td>
</tr>
<tr>
<td>Midwest</td>
<td>RFC (non-PJM)</td>
<td>Mix</td>
<td>7%</td>
</tr>
<tr>
<td>Upper Midwest</td>
<td>MRO</td>
<td>Regulated</td>
<td>-6%</td>
</tr>
<tr>
<td>ERCOT</td>
<td>TRE</td>
<td>Competitive</td>
<td>-2%</td>
</tr>
<tr>
<td>WECC</td>
<td>WECC (non-California)</td>
<td>Regulated</td>
<td>1%</td>
</tr>
<tr>
<td>California</td>
<td>California</td>
<td>Regulated</td>
<td>-7%</td>
</tr>
<tr>
<td>Total US</td>
<td>Continental US</td>
<td>Mix</td>
<td>1%</td>
</tr>
</tbody>
</table>
Alternative crediting approaches could reduce regional disparities

- Remove existing renewables from the baseline?
- Vary percentage targets based on current generation mix?
- Credit more existing clean energy generation (i.e., nuclear or NGCC)?
- First two alternatives may be seen as penalizing renewable energy investment; crediting existing nuclear likely to be controversial

Given the CES target proposed by the Administration, difficult to avoid disproportionate impacts on coal-intensive regions

BPC is conducting additional analysis on CES design and implications for regional impacts
Clean Energy Generation Resources by Region, 2009

Source: EIA. Clean energy defined in accordance with President’s proposal, including 0.5 credit for gas.
For more information:
Extra Slides
## Relationship between total clean energy goal and CES Requirement

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Clean Energy Goal</th>
<th>CES Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>45%</td>
<td>11%</td>
</tr>
<tr>
<td>2015</td>
<td>50%</td>
<td>16%</td>
</tr>
<tr>
<td>2020</td>
<td>55%</td>
<td>23%</td>
</tr>
<tr>
<td>2025</td>
<td>60%</td>
<td>29%</td>
</tr>
<tr>
<td>2030</td>
<td>70%</td>
<td>40%</td>
</tr>
<tr>
<td>2035</td>
<td>80%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Overview of Scenarios Analyzed

• **Reference Case 1:** Reference case with most electricity market assumptions based on AEO 2010. Reference Case 1 contains the Clean Air Interstate Rule (CAIR) but does not contain any national level GHG, air toxics, or ash and water regulations. It also contains state renewable portfolio standards and state air quality regulations affecting the power sector.

• **CES:** This scenario contains a CES consistent with the President’s targets, implemented with electricity market conditions as specified under Reference Case 1.

• **CES Low Gas:** This scenario is the same as the CES case, except that the price of natural gas is assumed to be $1.00 per mmBtu lower over the model time horizon than the projected price in that case.

• **Reference Case_EPA:** This case expands Reference Case 1 to capture the potential impacts of forthcoming EPA regulations that will impact the power sector (CATR, MACT, 316(b) coal ash residuals).

• **CES_EPA:** This scenario implements the CES discussed above on top of electricity market conditions as specified in Reference Case_EPA.
Projected CO2 Emissions