Output-based Allocation Methodology under CT’s NOx Budget Programs & CHP Set-Aside under CT’s RGGI Rule

Chris Nelson, CT DEP
Overview for EPA Clean DG Policy and CHP Webinar Series
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Through the years...

- Use of output-based allocation methodologies in CT’s NOx Budget Programs (NBPs) has evolved over time and continues to evolve
  - 1999-2002: No output data used
  - 2003-2008: Updating output (MWh) data used for older electricity generating units (EGUs)
  - 2009-2011: Updating output (MWh) data used for both older & newer EGUs, but applied differently
  - 2012-?: Updating output (MWh) data used for both older & newer EGUs and applied in a consistent manner
Cogens & Industrials: Allocations based on heat input for that ozone season (OS).

New EGUs and other new units (any unit that commenced operation after 1990): Allocations based on heat input for that OS.

Baseline EGUs: Remainder pool of allowances prorated to baseline EGUs based on 1990 OS heat input.

New source set-aside: No specific set-aside account established.
Cogens, Industrials and other new units (commenced operation after 1990 and operated in two previous ozone seasons): Allocations based on avg heat input for two previous OS.

New source set-aside: Allocations based on # of operating hours in current OS.

Baseline EGUs: Remainder pool of allowances (including leftovers from new source set-aside) prorated to baseline EGUs based on avg MWh output from two previous OS.
NBP (CAIR years) 2009-2011

- Cogens & Industrials: Allocations based on avg heat input from 2005/2006 OS.
- New source set-aside: Allocations based on # of operating hours in that current OS.
- EE/RE set-aside: Allowances allocated to qualifying EE/RE projects.
- Phase I EGUs: 1.2 lb/MWh x avg MWh output from 2005/2006 OS.
- Phase II EGUs: Remainder pool of allowances prorated to newer EGUs based on avg MWh output from 2005/2006 OS.
- Unallocated allowances from set-asides accounts: Prorated to both Phase I and Phase II EGUs based on avg MWh output from 2005/2006 OS.
NBP (CAIR years) 2012-?

- Cogens & Industrials: Allocations based on avg heat input from 5th/6th previous OS (e.g., 2006/2007 for 2012 allowances).

- New source set-aside: Allocations based on # of operating hours in the previous OS.

- EE/RE set-aside: Allowances allocated to qualifying EE/RE projects

- Phase I & Phase II EGUs: Remainder pool of allowances prorated to all EGUs based on avg MWh output from 5th/6th previous OS.

- Unallocated allowances from set-asides accounts: Prorated to both Phase I and Phase II EGUs based on avg MWh output from 5th/6th previous OS.
## Effective NOx Allocation Rate to Baseline EGUs

<table>
<thead>
<tr>
<th>Year</th>
<th>OS NOx Tons Emitted</th>
<th># Allowances Received</th>
<th>OS Generation in previous 2 years (MWhs)</th>
<th>Effective Allocation Rate (lb/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>1552</td>
<td>3712</td>
<td>2,651,448</td>
<td>2.800</td>
</tr>
<tr>
<td>2004</td>
<td>1562</td>
<td>3752</td>
<td>1,867,275</td>
<td>4.019</td>
</tr>
<tr>
<td>2005</td>
<td>2430</td>
<td>3838</td>
<td>1,660,528</td>
<td>4.623</td>
</tr>
<tr>
<td>2006</td>
<td>1893</td>
<td>3862</td>
<td>2,097,620</td>
<td>3.682</td>
</tr>
<tr>
<td>2007</td>
<td>1544</td>
<td>3829</td>
<td>2,319,671</td>
<td>3.301</td>
</tr>
<tr>
<td>2008</td>
<td>1204</td>
<td>3824</td>
<td>1,892,217</td>
<td>4.042</td>
</tr>
</tbody>
</table>

- Average NOx emission rate for 2003-2007 for Baseline EGUs was 1.862 lb/MWh
# NOx Allocation Methodology Comparison

<table>
<thead>
<tr>
<th></th>
<th>Cogen / Industrial Units</th>
<th>Baseline (Phase I) EGUs</th>
<th>New (Phase II) EGUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone Season Emissions (tons)</td>
<td>445</td>
<td>1,561.7</td>
<td>177.1</td>
</tr>
<tr>
<td>Ozone Season Generation (MWhs)</td>
<td>N/A</td>
<td>1,655,899</td>
<td>4,352,224</td>
</tr>
<tr>
<td>Average NOx Emission Rate (lb/MWh)</td>
<td>N/A</td>
<td>1.886 lb/MWh</td>
<td>0.081 lb/MWh</td>
</tr>
<tr>
<td>2003-2008 Methodology</td>
<td>437 allowances</td>
<td>2,268 allowances</td>
<td>187 allowances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.739 lb/MWh</td>
<td>0.086 lb/MWh</td>
</tr>
<tr>
<td>2009-2011 Methodology</td>
<td>437 allowances</td>
<td>1,240 allowances</td>
<td>1,215 allowances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5 lb/MWh</td>
<td>0.558 lb/MWh</td>
</tr>
<tr>
<td>2012-? Methodology</td>
<td>437 allowances</td>
<td>675 allowances</td>
<td>1,780 allowances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.817 lb/MWh</td>
<td>0.817 lb/MWh</td>
</tr>
</tbody>
</table>

- Analysis based primarily on 2004 ozone season data.
CO2 Allocations under RGGI

- The Regional Greenhouse Gas Initiative (RGGI) is a cap & trade program for large, fossil fuel-fired EGUs
- CT originally considered output-based methodology similar to NBP (CAIR – Phase 2)
  - Looked at gathering useful thermal data to include cogens in output-based approach, but good data was difficult to find
- Ultimately evolved to a methodology under which a majority of allowances were to be auctioned
Distribution of CT’s RGGI CO$_2$ Allowances

Under 22a-200c, CT distributes allowances as follows:

- 77% (minimum) of allowances offered for sale at auction, with proceeds supporting clean energy and energy efficiency
- 23% of allowances set aside to support CT energy policies
  - CHP Long-term Power Purchase Agreement (13% offered for sale at a fixed price)
  - Combined heat and power (CHP) useful thermal output (up to 5%)
  - Customer-side distributed resources (up to 3.5%)
  - Voluntary clean energy purchase (1.5%)
CT RGGI units that produce useful thermal output in addition to electricity can apply for free allowances from CT set-aside account.

Additional support for CHP units of all sizes may come from RGGI auction revenue directed to CT clean energy and energy efficiency funds (92.5% of total auction revenue).
Emissions Performance Standards (EPS) in CT

- CT DEP drafted an output-based EPS regulation (based on a NESCAUM model rule from Dec 1999)
  - Included output-based (lb/MWh) standards for NOx, SO2, CO2, Hg
- CT rule is on hold
  - Statutory triggers have kept regulation from being implemented
Questions?

Chris Nelson
CT DEP
860-424-3454
chris.nelson@ct.gov