HIGH ELECTRIC DEMAND DAYS

Upgrading Emission Inventories and Modeling
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NYSDEC
OVERVIEW

- OTC High Electric Demand Day (HEDD) Initiative
- Update on NYSDEC’s Actions to Reduce NOx Emissions on HEDD
- Accounting for HEDD Emissions in Air Quality Models
Ozone Transport Commission
HEDD Initiative

- Established a list of HEDD units in a 6 state area (MD, DE, PA, NJ, NY, CT)
- Established an emission reduction goal
  - Looked at the emission difference between a Typical Summer Day (June 4, 2005) and a High Electric Demand Day (July 26, 2005)
  - Units Included in the Analysis
    - Combustion Turbines – Included all units
    - Non-Base Load Boilers
    - List adjusted by states
- Applied an emission reduction level to Uncontrolled Units
## State Reduction Responsibility

<table>
<thead>
<tr>
<th>State</th>
<th>NOx (tons per day)</th>
<th>Percent Reduction from HEDD Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>11.7</td>
<td>25%</td>
</tr>
<tr>
<td>DE</td>
<td>7.3</td>
<td>20%</td>
</tr>
<tr>
<td>MD</td>
<td>23.5</td>
<td>32%</td>
</tr>
<tr>
<td>NJ</td>
<td>19.8</td>
<td>28%</td>
</tr>
<tr>
<td>NY</td>
<td>50.8</td>
<td>27%</td>
</tr>
<tr>
<td>PA</td>
<td>21.8</td>
<td>32%</td>
</tr>
<tr>
<td>Total</td>
<td>134.9</td>
<td></td>
</tr>
</tbody>
</table>
What is NY doing to meet its HEDD commitment?

- Revisions to NOx RACT rule (Subpart 227-2)
  - Turbines and Load-following Boilers
  - Under Review by Governor’s Office of Regulatory Reform

- Distributed Generation Rule (Part 222)
  - New rule – still under development
  - Existing DG – sources not covered by Subpart 227-2
  - New DG – ALL new DG not otherwise subject to NSR
Energy Efficiency Portfolio Standard (aka 15 x 15 Initiative)
- Initial Order by the Public Service Commission: 6/23/08
  - Covers period through 2011
- Second Phase of Working Groups: July – November 2008
  - Additional PSC Orders have been issued: workforce training, natural gas efficiency, etc.

Environmental Justice Study
- Spin-off from EEPS Working Group VIII
- Evaluated Potential for Demand Response to Offset Generation from Peaking Turbines
- Report submitted to PSC on May 27, 2009

Demand Response Initiative (Zone J – Con Ed)
- Expand DR in NYC – PSC Order Expected 10/15/09
  - Reduce System Peak – 100 hours/year of peak demand
    - Reduce energy and capacity payments
    - Reduce emissions from peaking turbines located near potential EJ communities
Stakeholders: Power producers, NYISO, EPA, environmental groups, EPA, DEC....

Two Issues Discussed regarding HEDD Emissions:

1. Need for reliable methodologies for determining HEDD emissions.

2. Need to develop techniques for estimating future year emission inventories for planning and modeling.
Ozone Season Day (OSD) = “Typical Summer Day”

High Electric Demand Days
- Occur several days after the start of a heat wave
- High relative humidity
- Electrical demand for air conditioning

Peaking turbines not included in the predictive electricity generation models.

Demand response engines not considered in the emissions estimates for an OSD.
Current Modeling Practice

Default Temporal Profiles for Electric Generating Units Used in SMOKE
a) monthly profile
b) weekly profile
c) diurnal profile
Actual Operational Profiles

Operation Profile for a Continuously Operated Unit. This unit operated 97% of the time in 2002.
Actual Operational Profiles (continued)

Operation Profile for an Occasionally (Peaking) Operated Unit. This unit operated 25% of the time in 2002.
2002 SIP Modeling Platform

2002 Hourly NOx Emissions in the MANE-VU Region from CEM Data and SMOKE-Processed Point Source Files (Adjusted to Remove the Effect of non-CEM-matched Point Sources)

State specific temporal profiles based on 2002 CEM data, developed by VISTAS
Work being conducted by NJDEP.

Modeling:
- Base year: 2005
  - Meteorology
  - CAMD Data
  - National Emissions Inventory Data

Results Due: December 31, 2009
Next Steps

- Four Recommended HEDD Simulations
  - Run #1 - 2007 base case using CAMD hourly data rather than SMOKE profiles to allocate annual emissions.
  - Run #2 - 2007 base case using SMOKE profiles to allocate annual emissions.
  - Run #3 - Run #1 with all major HEDD units turned off.
  - Run #4 – Run #3 with displaced capacity redistributed.