

HIGH ELECTRIC DEMAND DAYS

Upgrading Emission Inventories and
Modeling

Robert G. Sliwinski, P.E.

NYSDEC

OVERVIEW

- ▣ OTC High Electric Demand Day (HEDD) Initiative
- ▣ Update on NYSDEC's Actions to Reduce NO_x 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

State	NO _x (tons per day)	Percent Reduction from HEDD Units
CT	11.7	25%
DE	7.3	20%
MD	23.5	32%
NJ	19.8	28%
NY	50.8	27%
PA	21.8	32%
Total	134.9	

What is NY doing to meet its HEDD commitment?

- ▣ Revisions to NO_x 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

What is NY doing to meet its HEDD commitment?

- 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

Emissions Inventory Conference

November 2008

- ▣ Stakeholders: Power producers, NYISO, EPA, environmental groups, EPA, DEC....

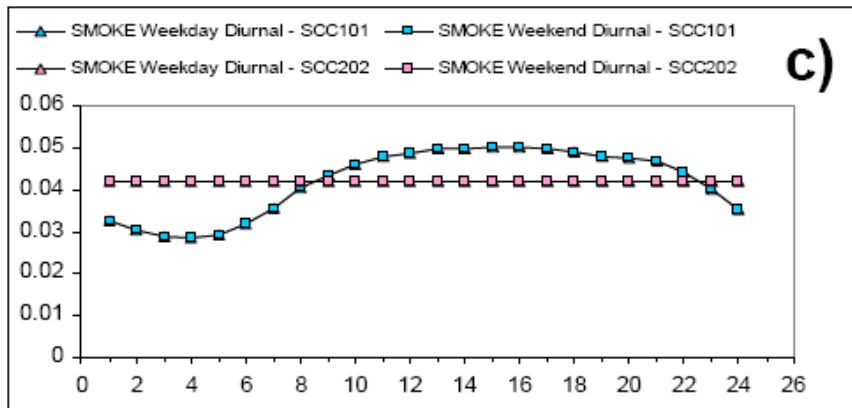
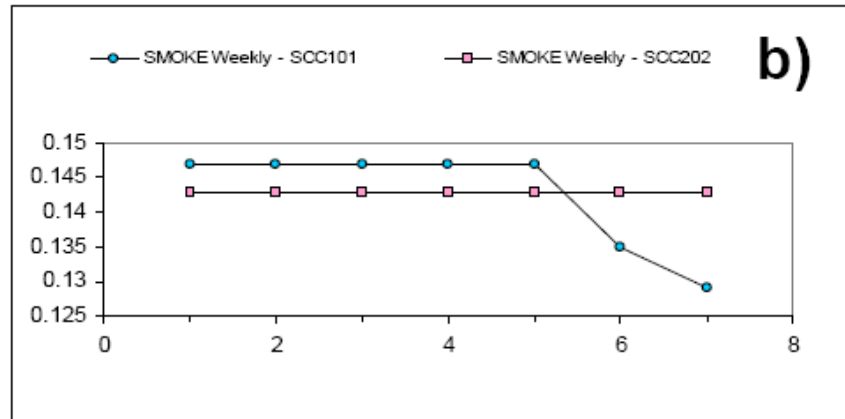
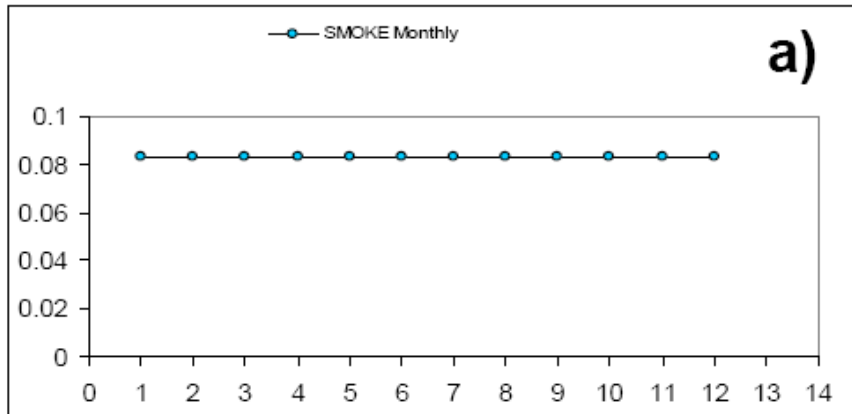
- ▣ Two Issues Discussed regarding HEDD Emissions:
 - 1. Need for reliable methodologies for determining HEDD emissions.

 - 2. Need to develop techniques for estimating future year emission inventories for planning and modeling.

Quantifying NO_x Emissions on HEDD

- ▣ 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.

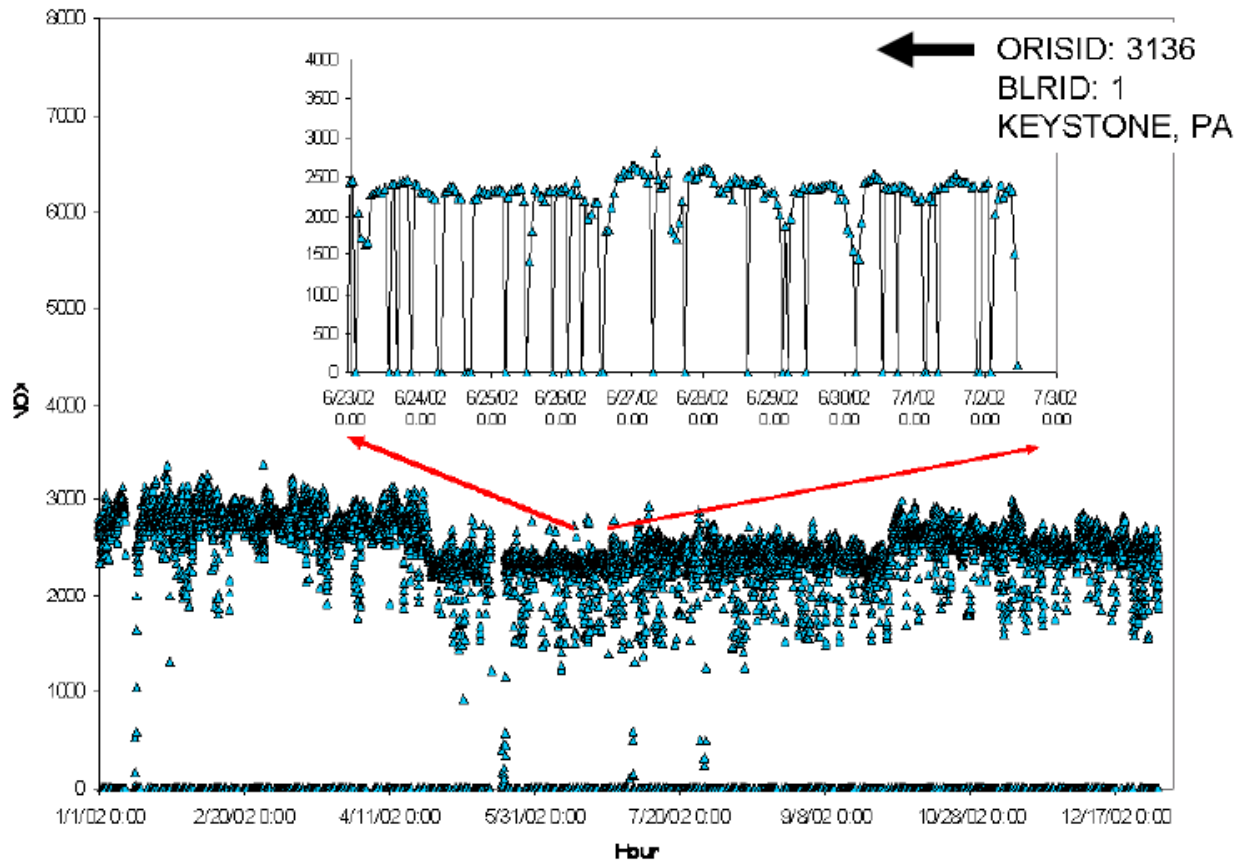
Current Modeling Practice



Default Temporal Profiles for Electric Generating Units Used in SMOKE

- a) monthly profile
- b) weekly profile
- c) diurnal profile

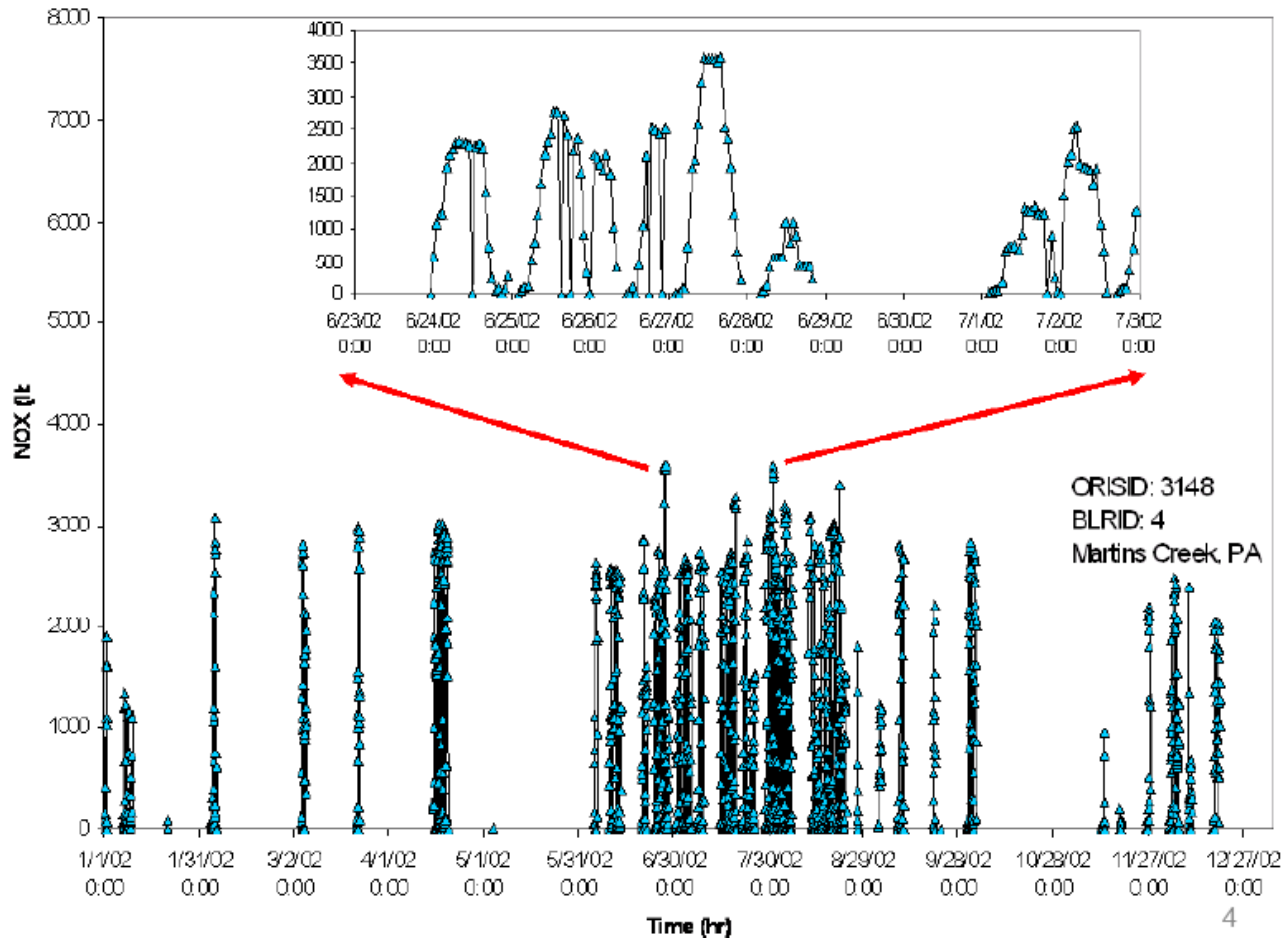
Actual Operational Profiles



**Operation Profile
for a
Continuously
Operated Unit.
This unit
operated 97% of
the time in 2002.**

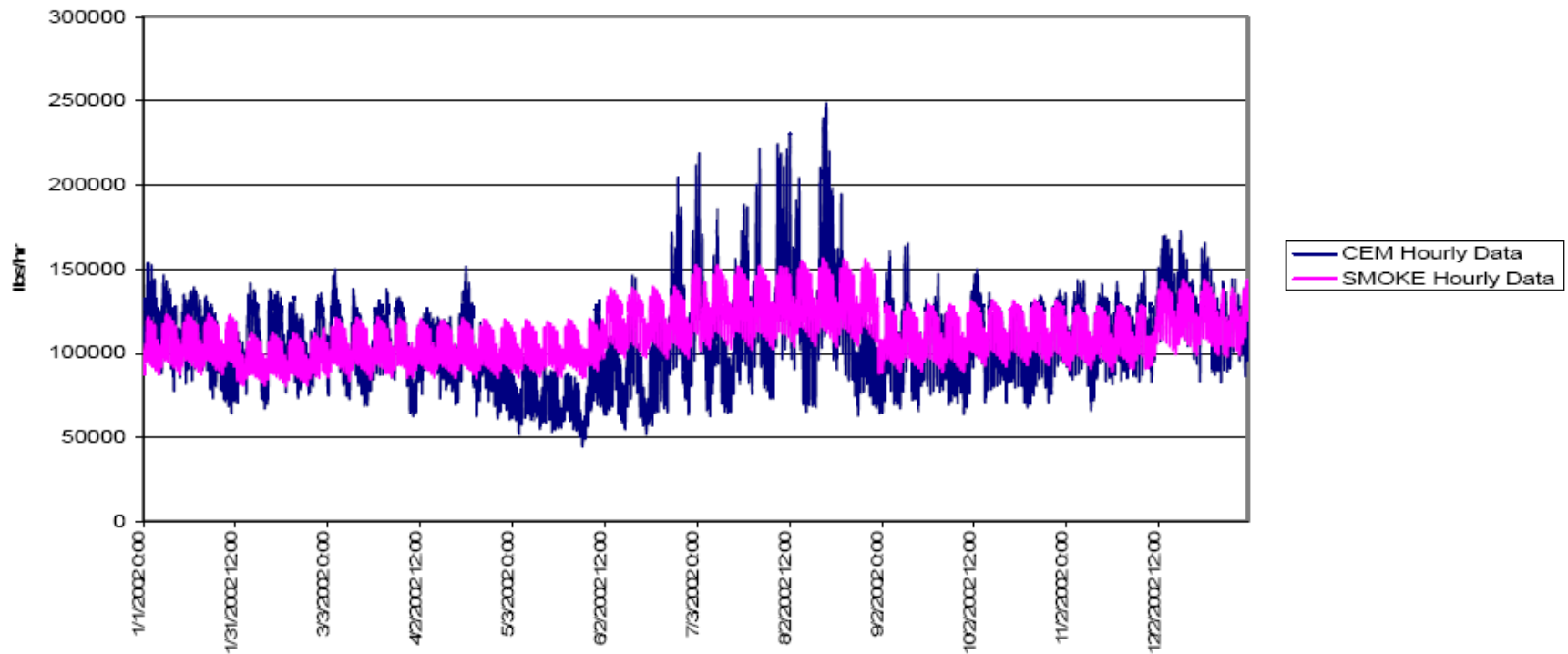
Actual Operational Profiles (continued)

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



2002 SIP Modeling Platform

2002 Hourly NO_x 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

Current Modeling Study

- ▣ 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.