

*High Electric Demand Day  
(HEDD) Stakeholder Meeting*

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February 27, 2008



# *Electric Demand Generally Highest During Last Three Years*

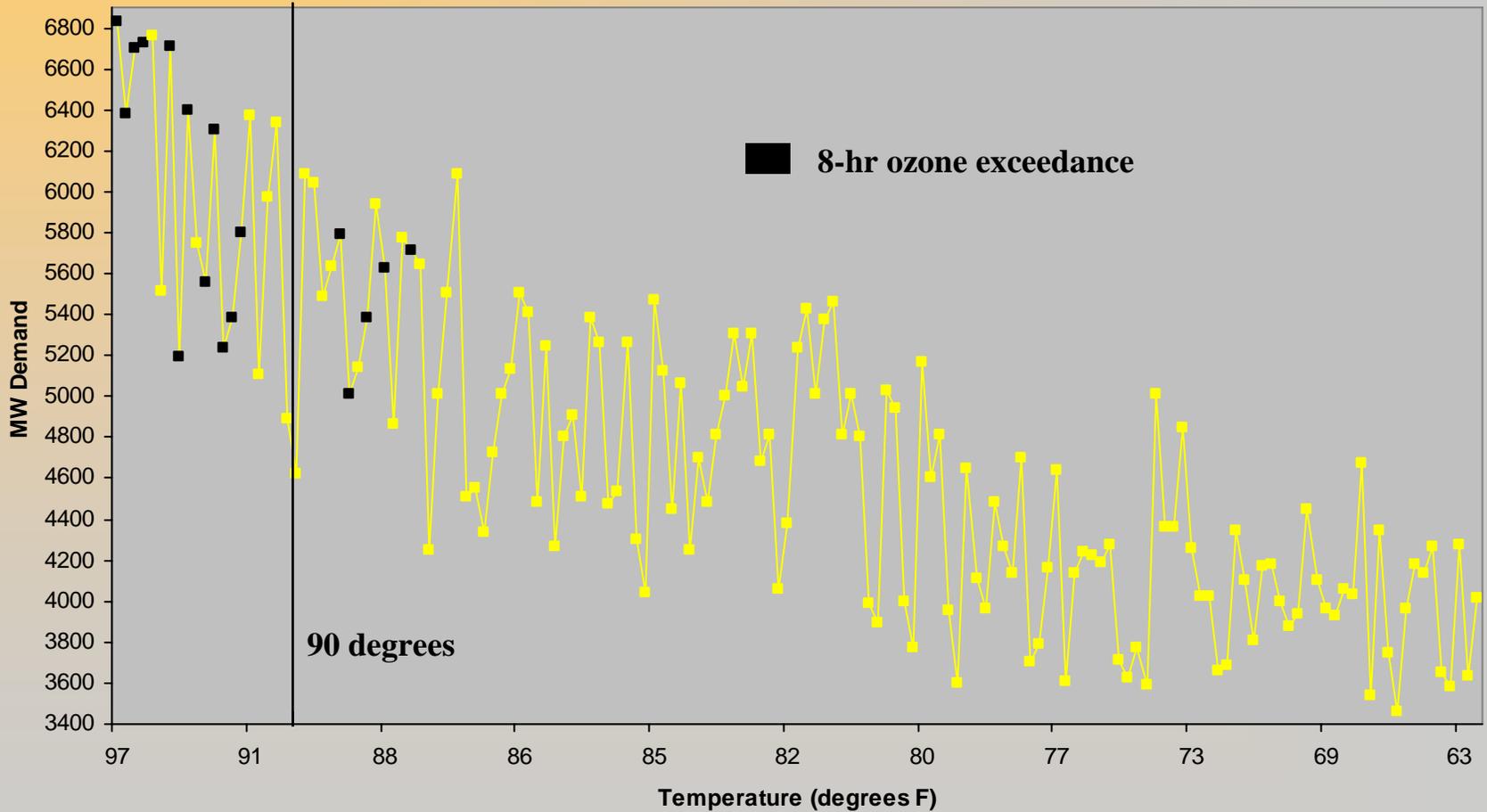


## Top 10 Demand Days

All Demand Days		Weekend Demand Days	
Date	Demand (MW)	Date	Demand (MW)
Aug 2, 2006	28,130	Aug 13, 2005	24,065
Aug 1, 2006	27,467	Aug 14, 2005	22,688
Jul 18, 2006	27,329	Aug 25, 2007	22,518
Aug 3, 2006	27,118	July 29, 2006	22,507
Jul 27, 2005	26,885	Jun 26, 2005	22,393
Jul 19, 2005	26,736	Jul 16, 2006	22,373
Jul 17, 2006	26,721	Aug 4, 2007	22,302
Aug 3, 2007	26,143	Jun 25, 2005	21,945
Jun 27, 2007	26,055	Sept 8, 2007	21,876*
Aug 5, 2005	25,983	Aug 18, 2002	21,452

\*Preliminary data.

# MW Demand as a Function of Temperature (2007 Ozone Season)





# *Dominant HEDD Contribution Varies by Area*

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★ New England – oil-fired load following boilers



★ NJ – combustion turbines

★ NYC – combustion turbines



★ PA – coal-fired load following boilers



# *2007 NBP Source HEDD Contribution Data for Connecticut*

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## ★ **June 26, 27, 28 2007 episode**

-LFBs comprised 43, 72 and 55% of NO<sub>x</sub> emissions, respectively, compared with monthly contribution of 28%.

-ACTs comprised 22, 0 and 0% of NO<sub>x</sub> emissions, respectively, compared with monthly contribution of 4%.

## ★ **July 9, 10 2007 episode**

-LFBs comprised 49 and 53% of NO<sub>x</sub> emissions, respectively, compared with monthly contribution of 24%.

-ACTs comprised 7 and 10.9% of NO<sub>x</sub> emissions, respectively, compared with monthly contribution of 3%.

## ★ **August 2, 3 2007 episode**

-LFBs comprised 47 and 71% of NO<sub>x</sub> emissions, respectively, compared with monthly contribution of 31%.

-ACTs comprised 24 and 0% of NO<sub>x</sub> emissions, respectively, compared with monthly contribution of 6.7%.

**Note:** Each of the above days was over 90 degrees Fahrenheit, was one of the top ten demand days in the 2007 ozone season, and was an 8-hr ozone exceedance.





# *Data Links*

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- ★ Clean Air Markets Division (EPA) – Hourly, Daily, Seasonal NBP unit level emissions

<http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard>



- ★ National Weather Service – 90 degree days

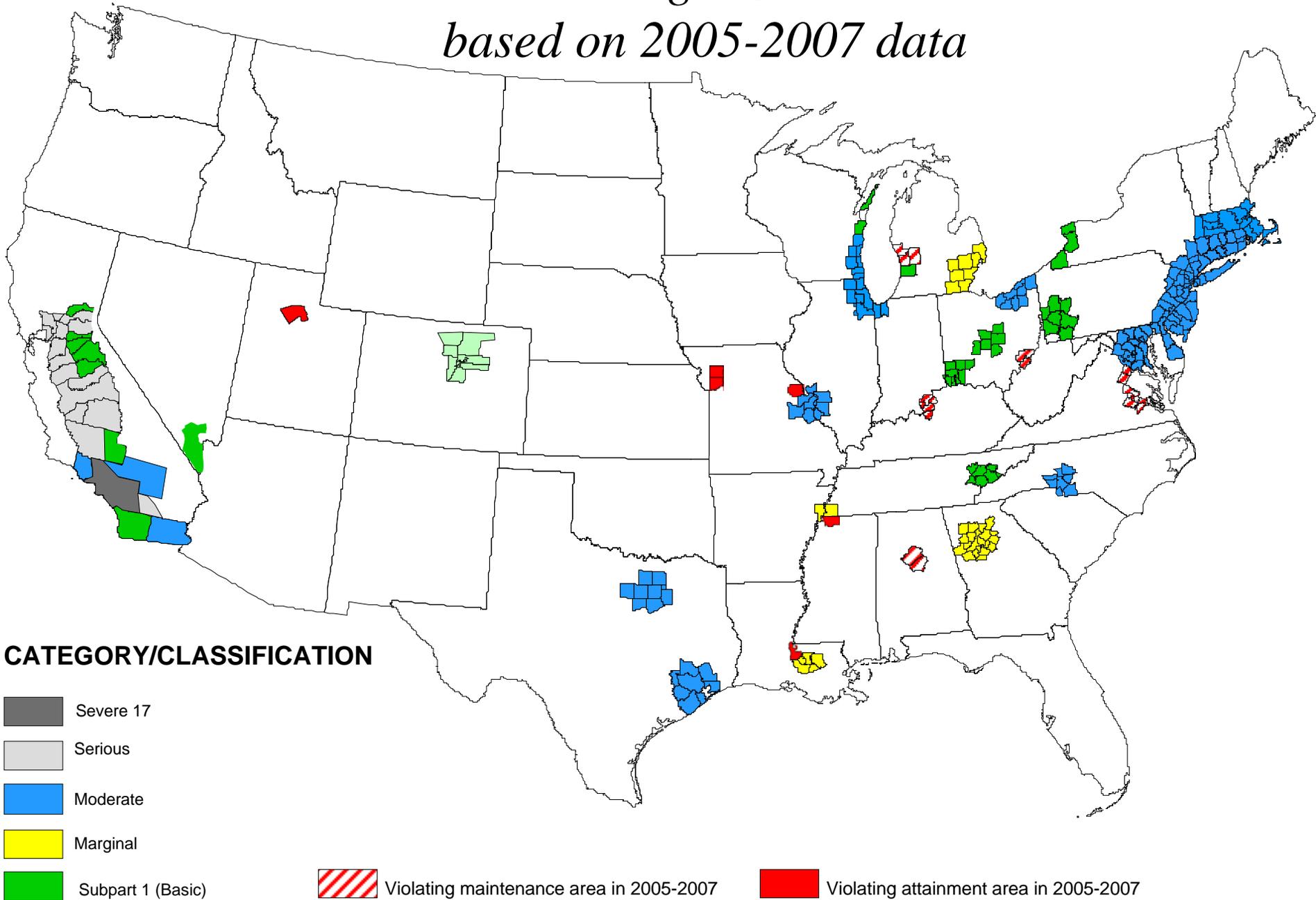
<http://www.weather.gov/climate/index.php?wfo=box>



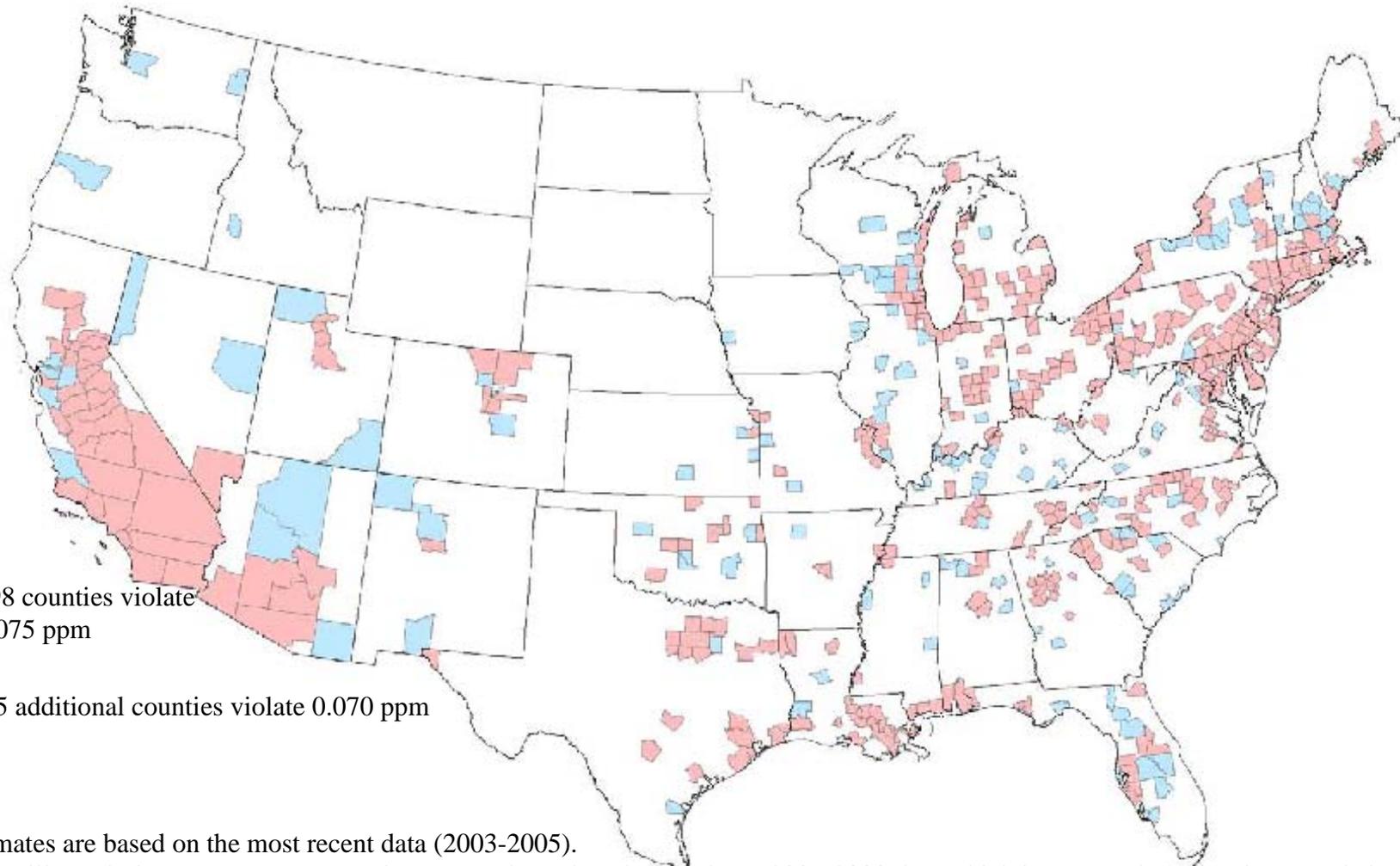
- ★ ISO-New England – Demand days

[http://www.iso-ne.com/markets/hstdata/znl\\_info/daily/index.html](http://www.iso-ne.com/markets/hstdata/znl_info/daily/index.html)

# Areas Violating Ozone Standard based on 2005-2007 data



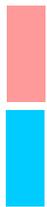
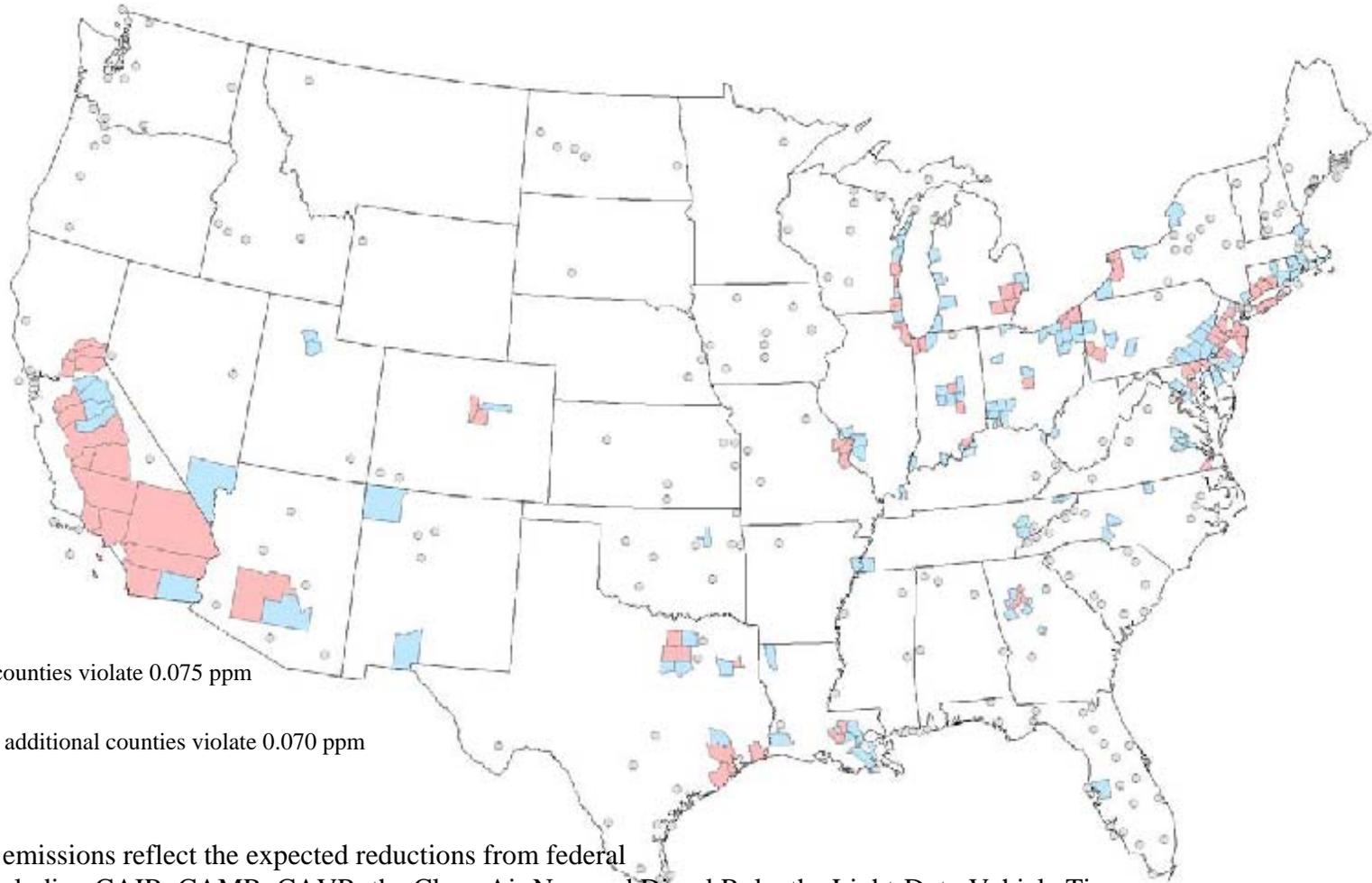
# Counties With Monitors Violating Alternate 8-hour Ozone Standards 0.070 and 0.075 parts per million



## Notes:

- 1) Estimates are based on the most recent data (2003-2005).
- 2) EPA will not designate areas as nonattainment on these data, but likely on 2006-2008 data which is expected to show improved air quality..

# Counties With Monitors Projected to Violate Alternate 8-hour Ozone Standards of 0.070 and 0.075 parts per million in 2020



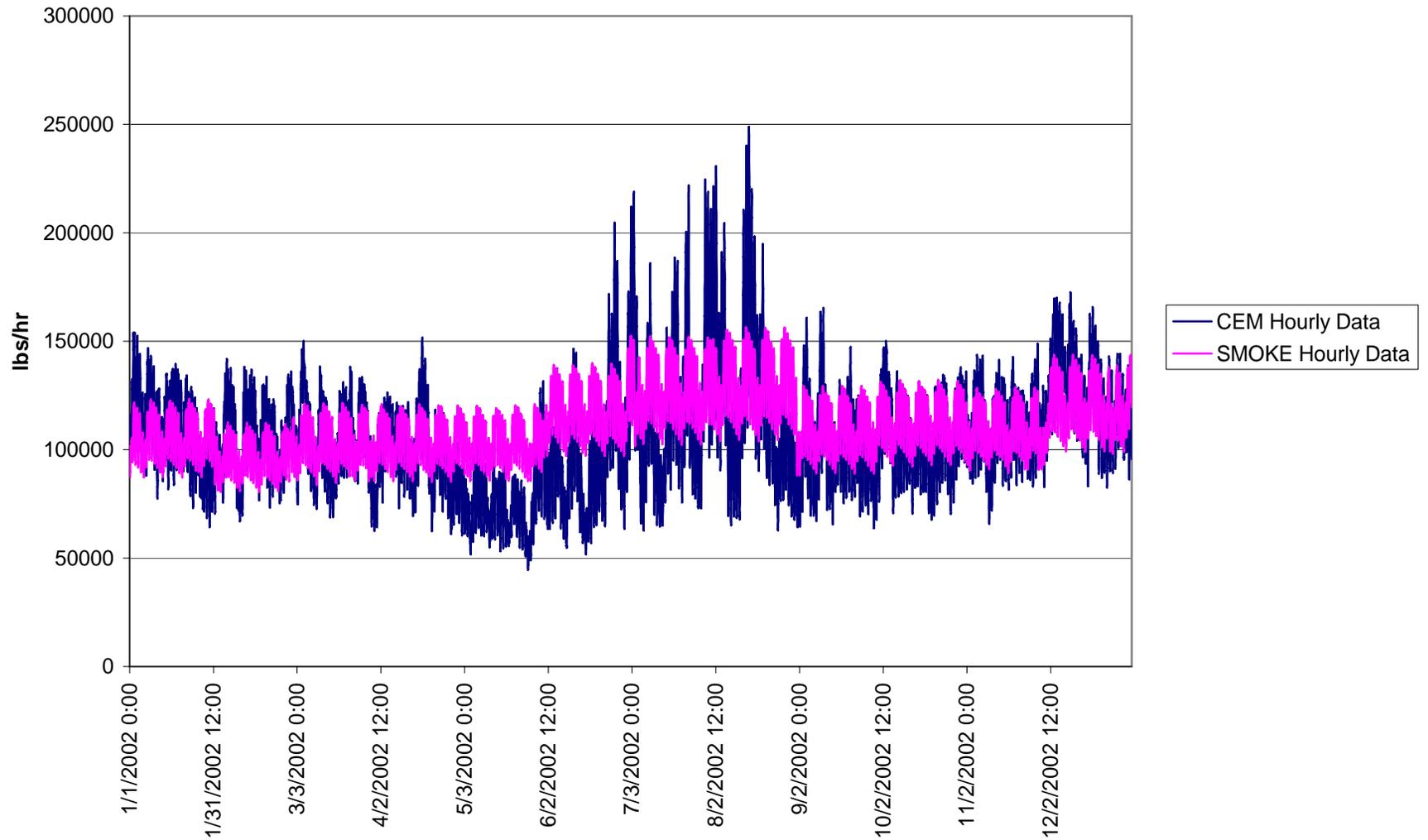
82 counties violate 0.075 ppm

121 additional counties violate 0.070 ppm

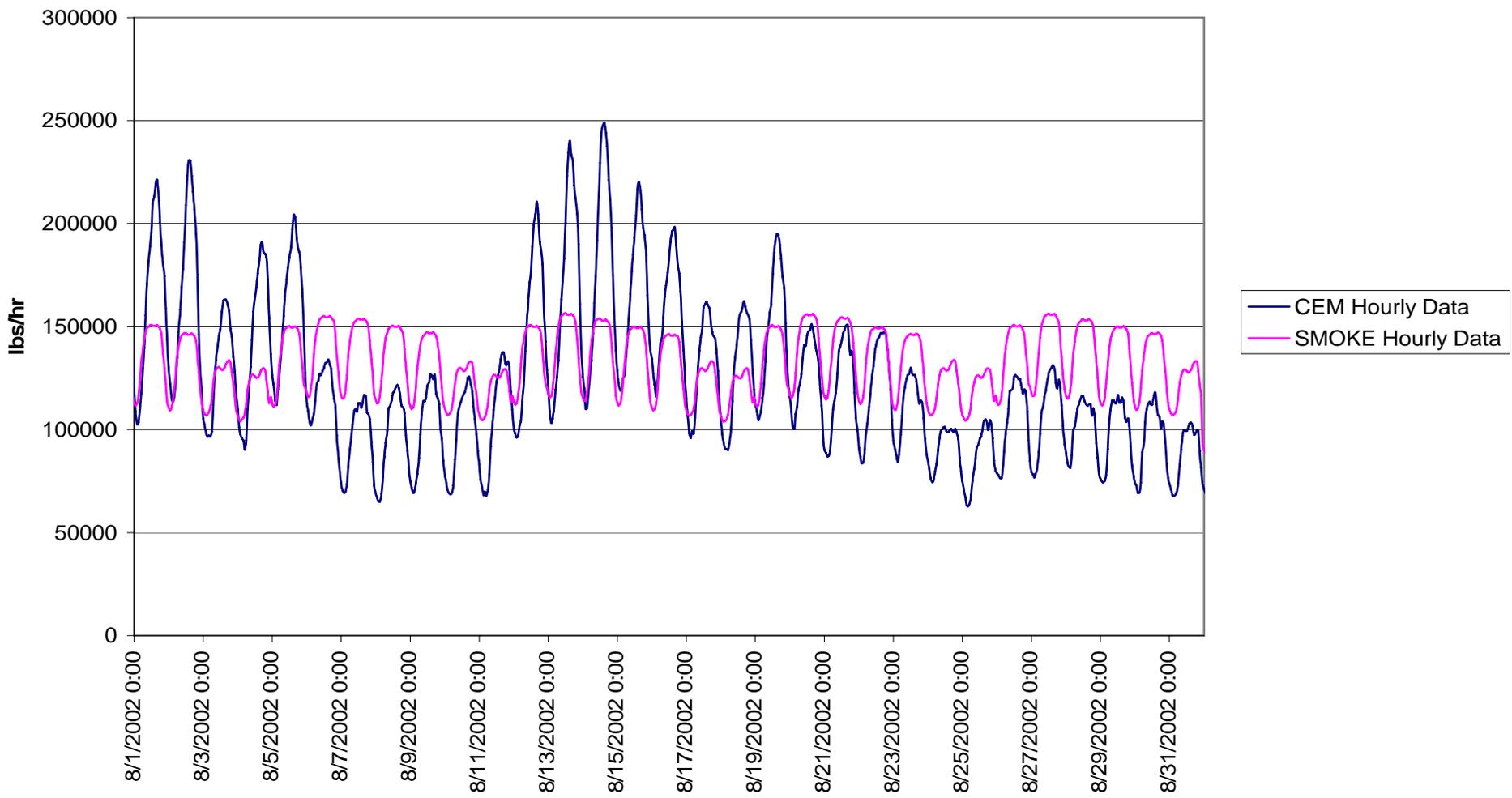
## Notes:

- 1) Modeled emissions reflect the expected reductions from federal Programs including CAIR, CAMR, CAVR, the Clean Air Nonroad Diesel Rule, the Light-Duty Vehicle Tier 2 Rule, the Heavy Duty Diesel Rule, proposed rules for Locomotive and Marine Vessels and for Small Spark-Ignition Engines, and state and Local level mobile and stationary source controls identified for additional reductions in emissions for the purpose of attaining the current PM 2.5 and Ozone standards.
- 2) Controls applied are illustrative. States may choose to apply different control strategies for implementation.

**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)**



**August 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)**





# *OTC HEDD MOU Commitments*



State	NOx (tons per day)	% Reduction from HEDD Units
CT	11.7	25
DE	7.3	20
MD	23.5	32
NJ	19.8	28
NY	50.8	37
PA	21.8	32
Total	134.9	



## *EE Policies*

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- ★ CTDEP is hoping to engage EPA during the next few months in order to better understand and quantify implications of energy efficiency policies.
- ★ Such policies may impact the ultimate HEDD reductions needed.





*In concert with HEDD, what other pollutants should we focus on for co-benefits?*



**SO<sub>2</sub>?**

**NO<sub>x</sub>**

**PM?**

**CO<sub>2</sub>?**



**Hg?**



# *Ozone Transport Region State Multi-Pollutant Programs*

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- ★ MD-Healthy Air Act- NO<sub>x</sub>, SO<sub>2</sub>, Hg – 15 EGUs
- ★ NH – Multiple Pollutant (NO<sub>x</sub>, SO<sub>2</sub>, Hg, CO<sub>2</sub>) Annual Budget Trading and Banking Program – 6 EGUs
- ★ MA – Emissions Standards for Power Plants – NO<sub>x</sub>, SO<sub>2</sub>, Hg, CO<sub>2</sub>, CO, PM<sub>2.5</sub> – EGUs emitting greater than 500 tons of SO<sub>2</sub> and NO<sub>x</sub> during 1997, 1998 or 1999 and meeting other criteria
- ★ DE-EGU Multi-Pollutant Regulation – NO<sub>x</sub>, SO<sub>2</sub> (8 EGUs) and Hg (6 of the 8 EGUs)



# *NO<sub>x</sub> Emission Rates*

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★ 40+ year old load following boiler, uncontrolled (residual oil): 0.28 lb/MMBtu



★ 40+ year old load following boiler with controls (residual oil):

- 0.18 lb/MMBtu (OFA/optimized SNCR)

- 0.05 lb/MMBtu (OFA/SCR)



★ New combined cycle combustion turbine (distillate oil): 0.02-0.03 lb/MMBtu



*2007 Scenario Analysis done by London Economics as part of Phase II RFP for DPUC (for new generation in CT)*

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★ Shows the likelihood of shutdown of 4000-5000 MW worth of boilers > 30 years old in NE region.



★ Connecticut LFBs (Middletown 2, 3, 4, Montville 5, 6, Norwalk 1, 2, New Haven Harbor 1, Bridgeport 2) are equivalent to approximately 2200 MW.





# *Regulatory Structure*

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- ★ It appears that there will be some shutdowns and some energy efficiency.
- ★ However, it appears that there is still the need for a regulatory backstop.
- ★ Controls might not be warranted until energy policies have been implemented and we know what additional reductions are needed.





# *Emerging State Approaches to HEDDs*

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★ Separate regulations targeting:

-Specific EGUs (decreasing rolling 24-hr average NO<sub>x</sub> and SO<sub>2</sub> emission limits for 2009 and 2012, intra-facility averaging allowed but no trading allowed to meet emission limits)

-Stationary combustion turbines (ozone season NO<sub>x</sub> emission limits)

★ Single regulation targeting:

-All HEDD boilers serving EGUs and all HEDD and non-HEDD stationary combustion turbines. 24-hour NO<sub>x</sub> emission limits (2009, 2012, 2015) start as input-based and change to output-based. Some units are required to meet HEDD reduction targets in addition to 24-hr NO<sub>x</sub> emission limits.





# *Specific Input Requested*

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- ★ Given multiple pollutants and energy market changes, are there critical timing issues we should be aware of in establishing shorter term and longer term objectives?
- ★ Should there be one reduction target developed or should there be decreasing reduction targets over time?
- ★ What types of emission units should the program apply to?
- ★ For assuring the HEDD emission reductions occur and are maintained, what limits should be applied?
- ★ Which pollutants should be addressed?
- ★ What is the most cost-effective approach?
- ★ Please e-mail your comments to [wendy.jacobs@po.state.ct.us](mailto:wendy.jacobs@po.state.ct.us)



# *Questions?*

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