

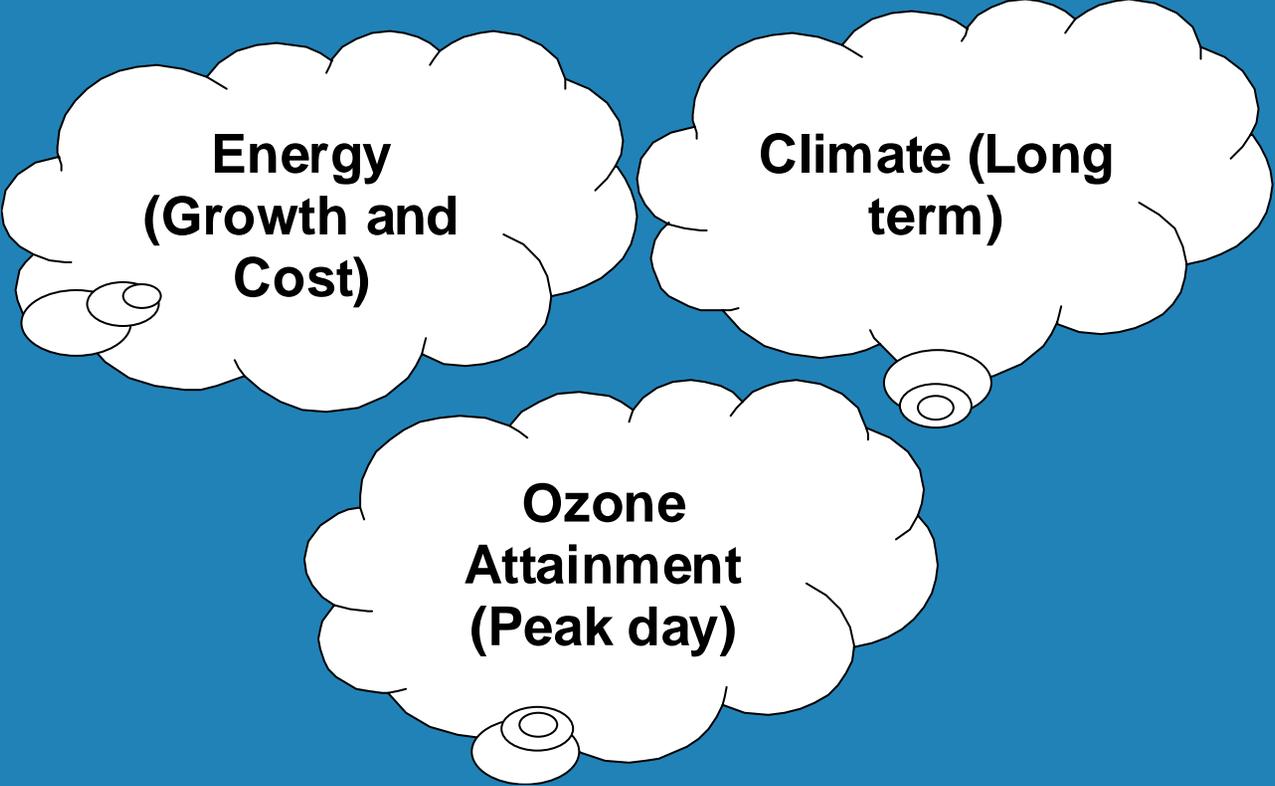


# Implementing High Electric Demand Day (HEDD) Strategy

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January 10, 2008  
SIPRAC Meeting

# Challenges



**Energy  
(Growth and  
Cost)**

**Climate (Long  
term)**

**Ozone  
Attainment  
(Peak day)**



# Peak Day Issue

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- Emissions from electric generating units (EGUs) are higher than average on HEDDs because more, old and dirty units are called to run.



# Ozone Transport Commission (OTC) Commitment

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- OTC recognized HEDD issue and entered into a process to define state strategies.
- March 2, 2007 MOU commits CT to implement HEDD strategy.



# Why CT Committed to HEDD Implementation

- Continue to face unhealthy air quality days.
- Unaccounted emissions have significant impact.
- Need for regional strategy to get effective NO<sub>x</sub> reductions in the I-95 corridor of the Ozone Transport Region.
- Modeling indicates tighter CAIR caps and Midwest power plant reductions alone won't solve our problem.



## Summer 2007 Ozone Levels

- The preliminary highest 4<sup>th</sup> high 8-hr ozone level for 2007 was 0.098 ppm, measured in Chicopee, MA.
- There were 17 8-hr ozone exceedances in CT in 2007 OS.
- CT-NY-NJ ozone non-attainment area may not attain by 2009 despite OTB/OTW strategies.

# OTC 2007 8-hour Ozone Preliminary 4th High

**Legend**

**Ozone Data**

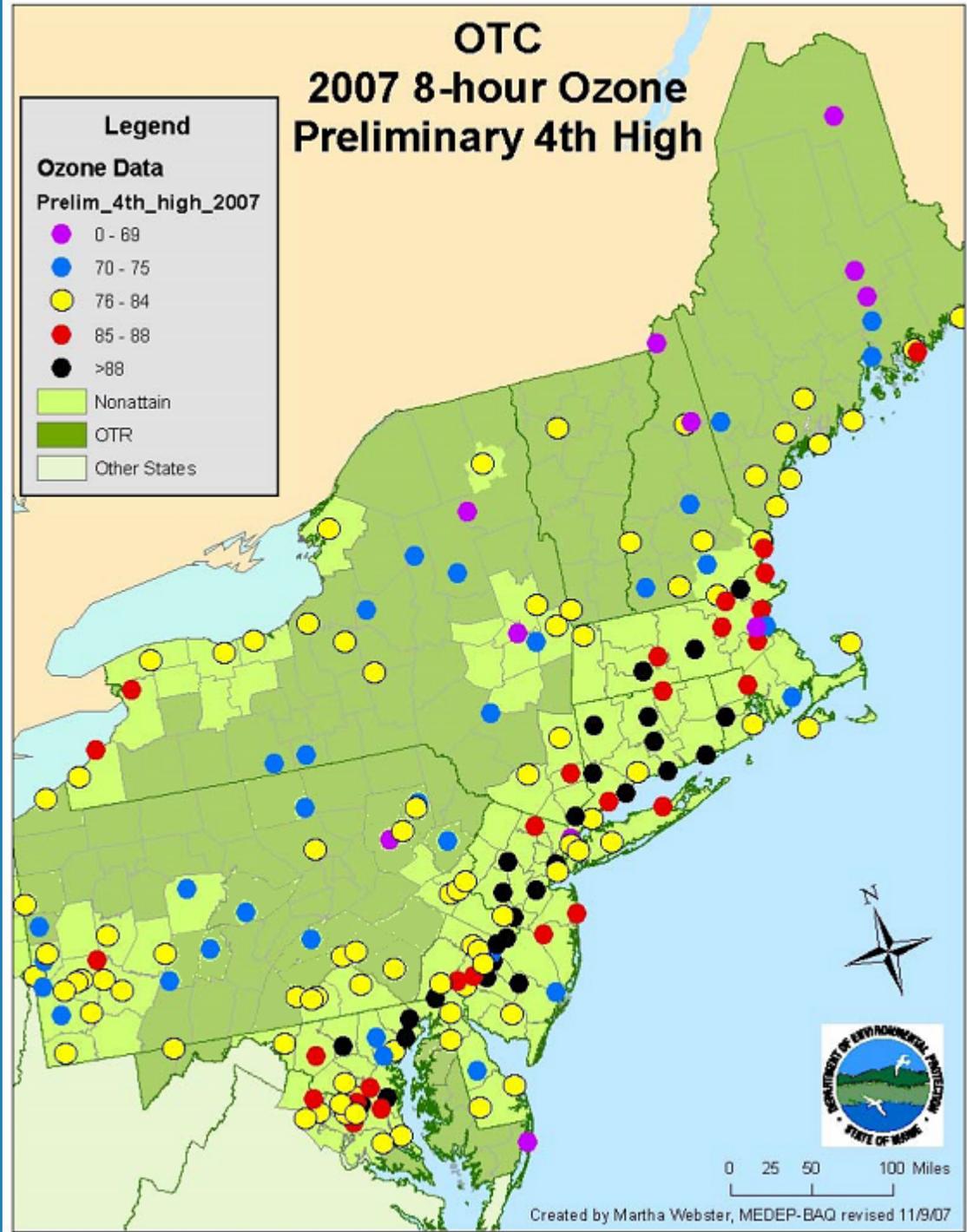
Prelim\_4th\_high\_2007

- 0 - 69
- 70 - 75
- 76 - 84
- 85 - 88
- >88

Nonattain

OTR

Other States

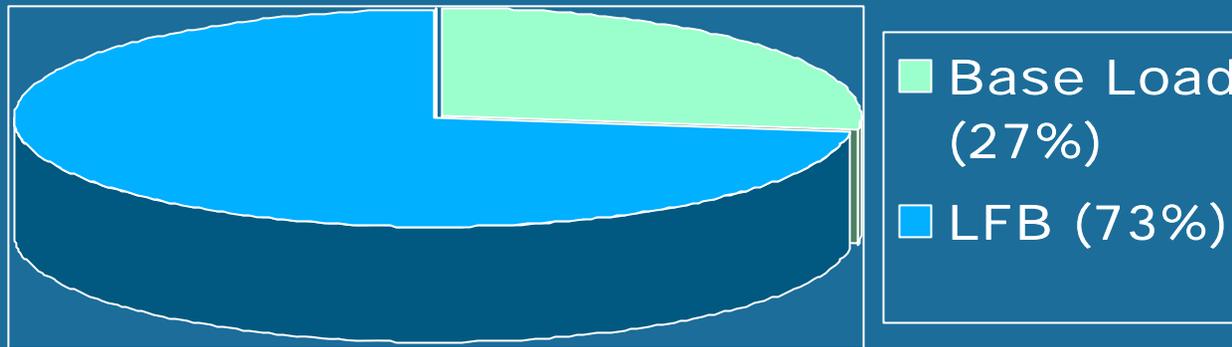


# Example Air quality needed for Design Value attainment in 2009

<u>Site Location</u>	4th High 8 - Hour Average								2007-2009 DV
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>Prelim. 2007</u>	2008	2009	
Middletown, CT	102	92	82	96	89	93	85	76	84
White Plains, NY	102	91	78	95	83	94	84	76	84

The 4<sup>th</sup> highest 8-hr ozone average needs to be dramatically lower in the near future in order to meet attainment by 2009.

# LOAD FOLLOWING BOILERS CONTRIBUTE MOST TO HEDD EMISSIONS IN CT (6/27/07)

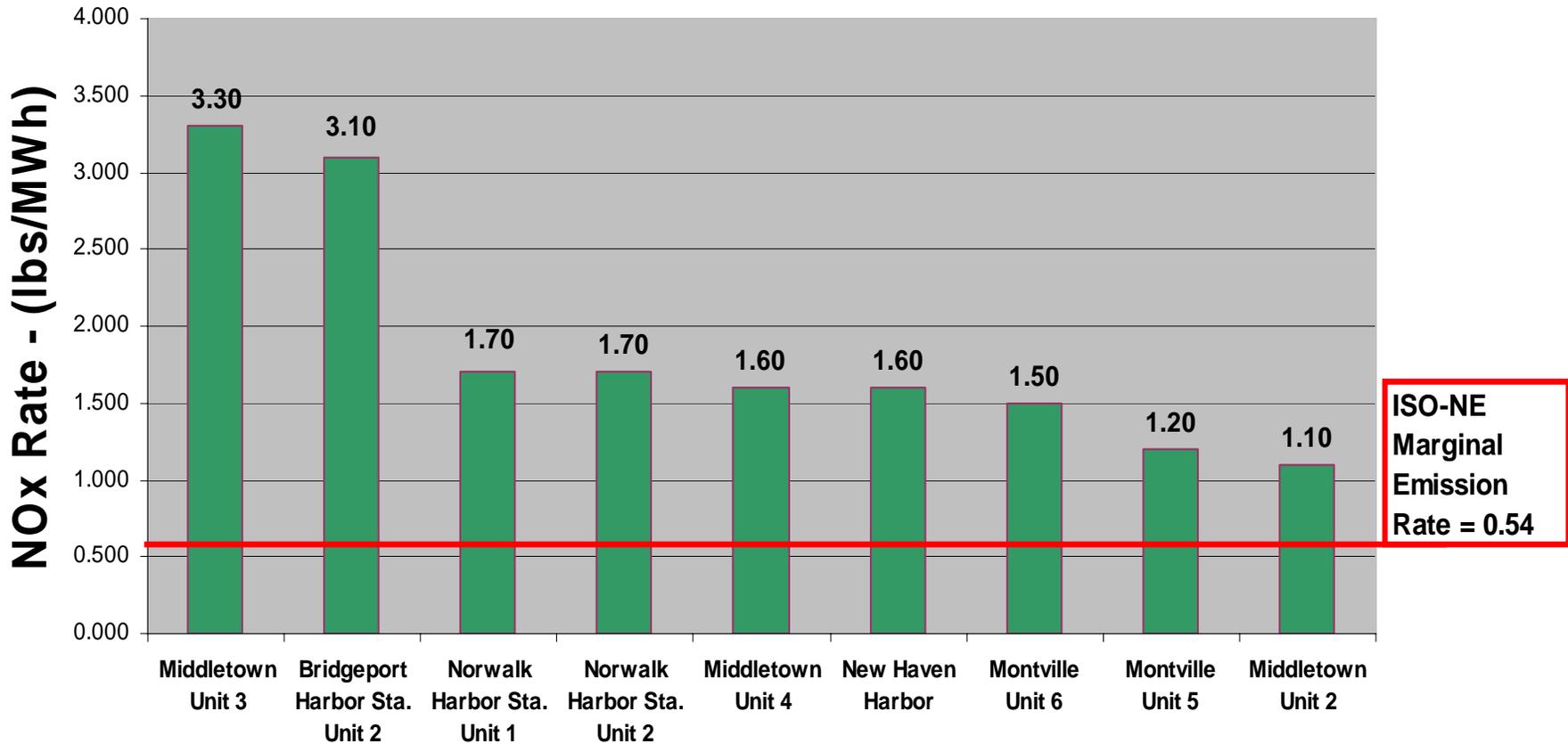


NOTE: NO AERO-DERIVATIVE COMBUSTION  
TURBINES RAN ON THIS DATE

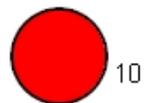
**Base Load** includes: AES, Bridgeport Energy, PSEG Bridgeport 3, Algonquin, Lake Road, Milford Power

**Load Following Boilers (LFB)** includes: PSEG Bridgeport 2 and New Haven Harbor, NRG Middletown 2, 3, 4, Montville 5, 6, and Norwalk Harbor 1, 2

# NOx RATES for LOAD FOLLOWING EGUs IN CONNECTICUT



Peak Day (tons per day)



## Maximum NO<sub>x</sub> Emissions (TPD) from Load Following Boilers on HEDDs \*

Middletown Power (20.6 tpd)

Unit 2 (2.5) 117 MW

Unit 3 (9.4) 236 MW

Unit 4 (9.0) 400 MW

Norwalk Power (7.2 tpd)

Unit 1 (3.6) 172 MW

Unit 2 (3.6) 172 MW

Montville Power (7.9 tpd)

Unit 5 (1.2) 81 MW

Unit 6 (6.7) 410 MW

PSEG Power New Haven Unit 1 (8.2 tpd)

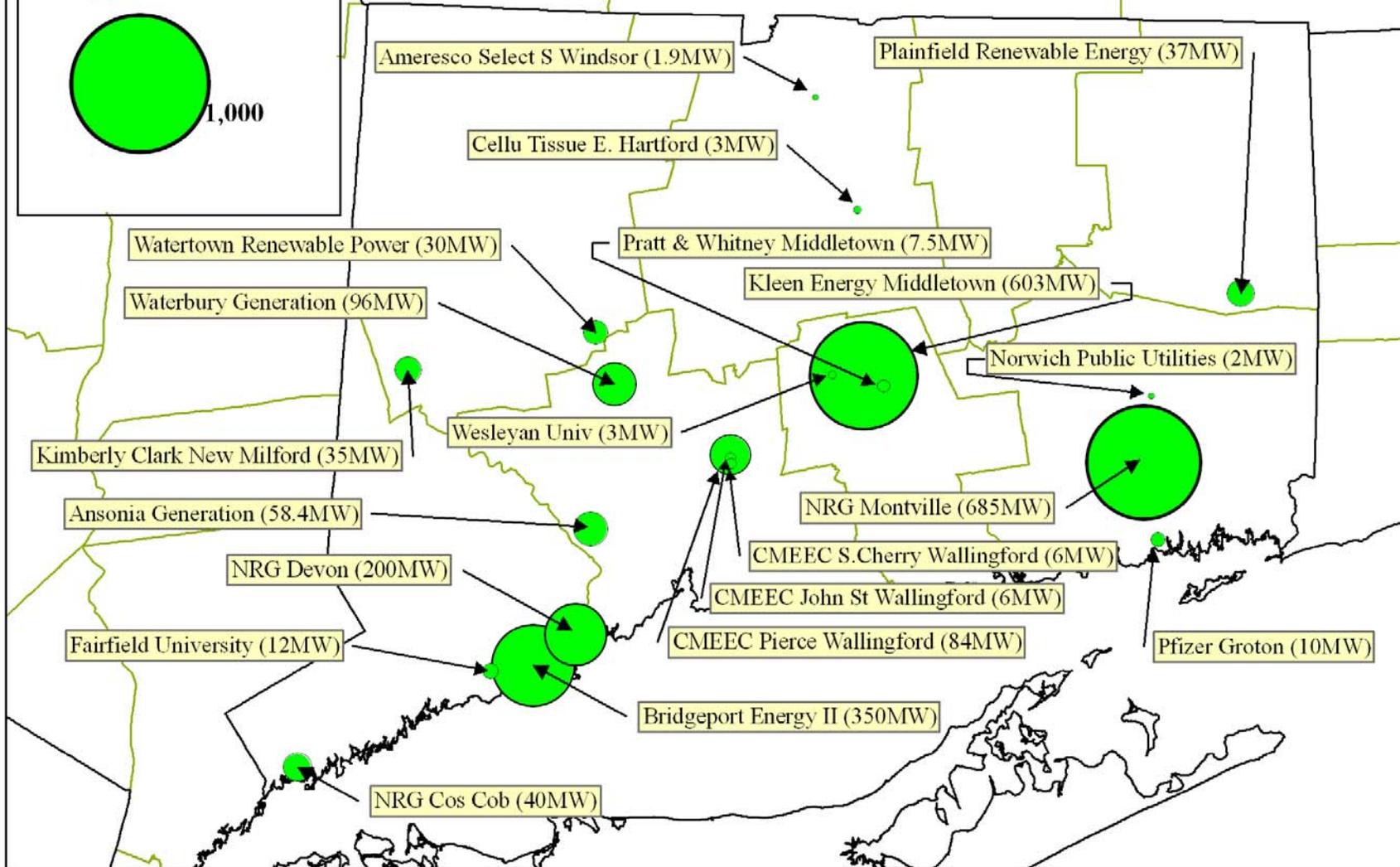
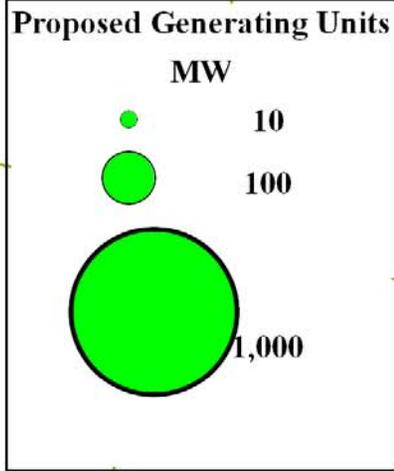
465 MW

PSEG Power Bridgeport Unit 2 (6.6 tpd)

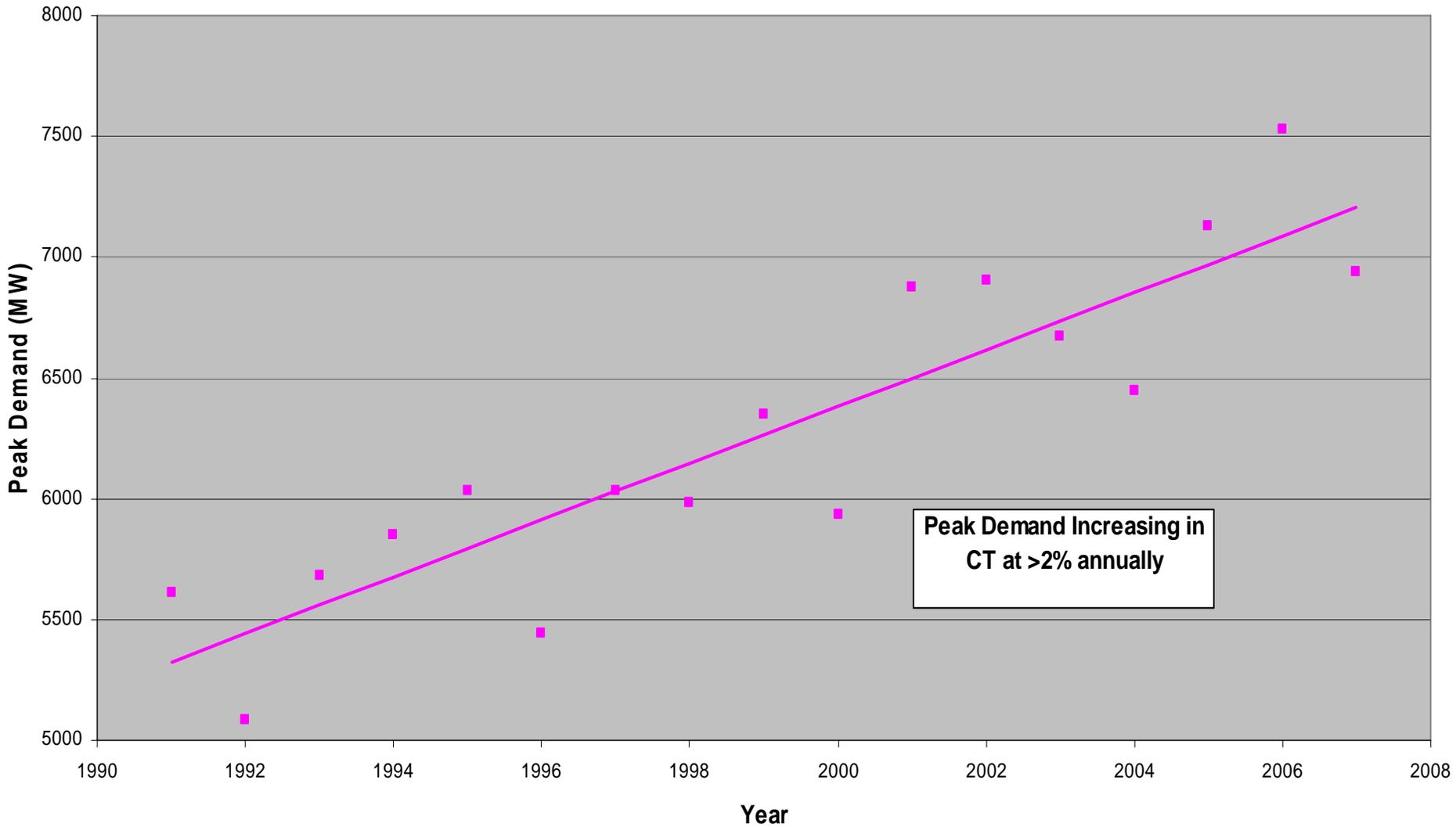
170 MW

\* Assumes actual NO<sub>x</sub> rate for 24 hours

# Proposed Electric Generating Units in CT that could Supply Peak Power Demand



# CONNECTICUT PEAK ELECTRIC DEMAND





# Energy Policies Being Implemented

- Public Act 07-242 and Integrated Resource Plan process
- Connecticut's Energy Vision (Governor Rell's Plan for a cleaner, greener Connecticut, 2006)
  - 20% reduction in electric-peak consumption by 2020
  - 20% of all energy used and sold in Connecticut will come from clean or renewable resources by 2020
- Connecticut Energy Advisory Board Energy Plan, 2006
  - Promote Energy Efficiency and Conservation
  - Promote Distributed Generation and Combined Heat & Power



# Reliability Considerations

- Regional Greenhouse Gas Initiative (RGGI) - climate will impact utility/energy planning.
- Proposed new generation in CT
  - 42.9 MW natural gas
  - 67.5 MW biomass
  - 74.4 MW oil
  - 2097 MW gas/oil
- Utility/energy planners not sure how HEDD units will be utilized going forward through the post-FCM time period.
- DPUC docket 07-06-62 – Report to General Assembly on Electric Reliability due in Feb. 2008.



# RGGI

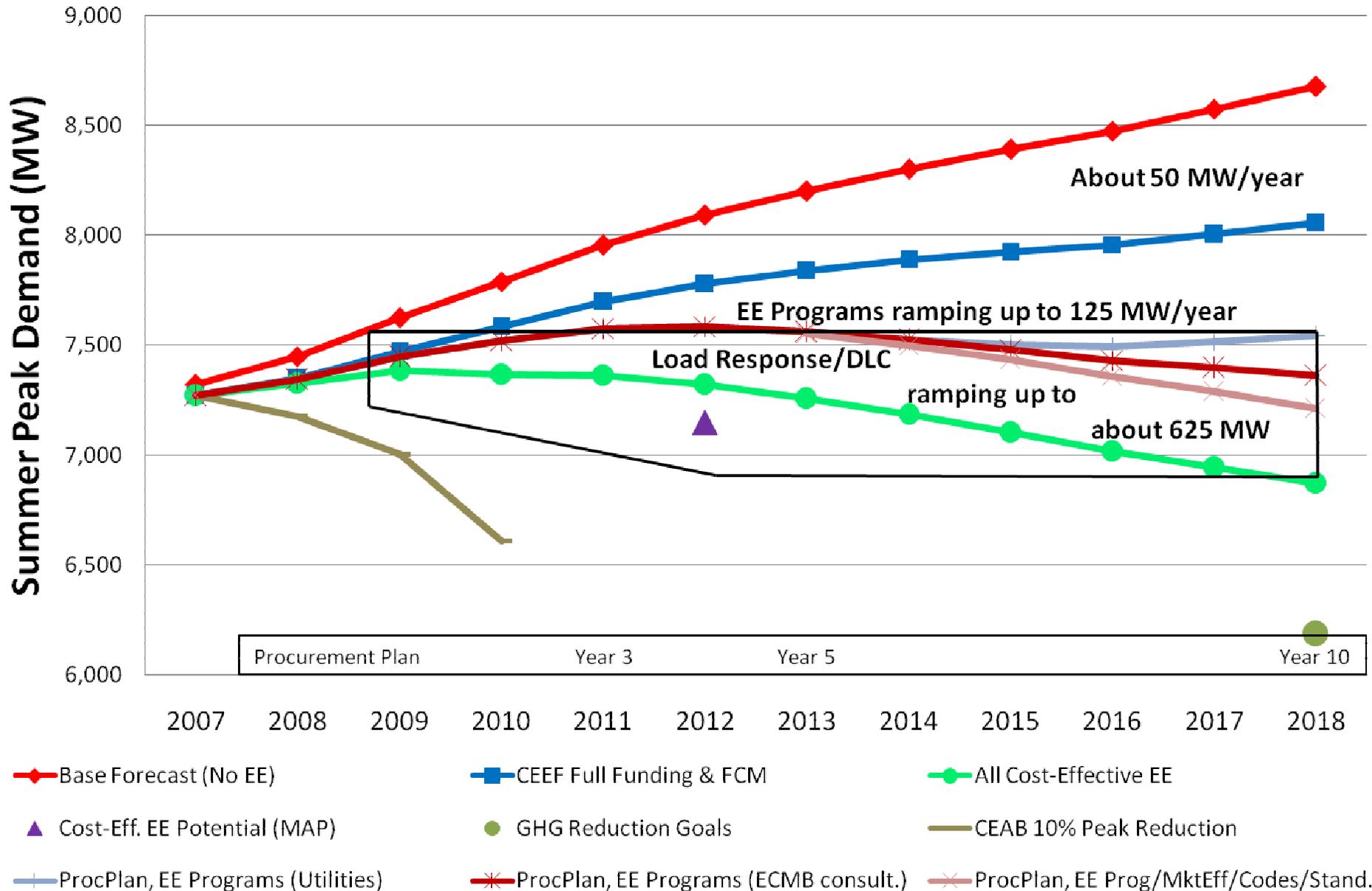
- PA 07-242 directs DEP to adopt RGGI
- Proposed rules now out for public comment
- Proposed rules require CO2 allowances to be auctioned and propose 63% of proceeds go to end-use EE
- This could amount to \$12-30 million/year additional funds for EE (in addition to systems benefit charge funds of \$70-90 million/year)



# Smart Meters

- DPUC is studying the economic benefit of the installation of advanced metering systems at residential as well as commercial and industrial facilities.
- If such measures prove cost effective and are implemented, this will allow time-of-use electric pricing scales to incentivize shifting load from times of peak demand.
- Would support HEDD commitment, and could yield approximately 1 tpd benefit as early as 2009.

# CT ECMB 2008 EE Planning Scenarios (Peak MW)

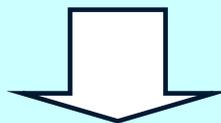


# Typical Summer Day Emissions From EGUs are Going Down but Emissions on HEDD Remain High

Emissions (TPD)						
Typical Summer Day in CT				High Electric Demand Day in CT		
8/7/2002	6/4/2005		$\Delta$	8/12/2002	7/26/2005	
19			39	58		
	10		44		54	



Emissions are decreasing



Delta getting larger--  
HEDD units have a more profound effect



# OTC HEDD Process

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- OTC, EPA, NJ and CT started meeting to discuss HEDD issues in early-mid 2006.
- Several meetings with stakeholders and other states (DE, MD, NY and PA) were held in the second half of 2006 and early 2007.
- Evaluated data, assessed options, agreed upon emission reduction target.
- DEP is now formulating CT strategy to achieve target – aiming for May 2009 but no later than May 2012 implementation.



# Flexibility

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- OTC HEDD MOU allows several mechanisms for achieving reductions, including, but not limited to, energy efficiency programs and demand response programs.



# Universe of HEDD Sources

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- The 11.7 ton per day OTC HEDD MOU reduction was calculated from a baseline including specific NRG and PSEG combustion turbines and load-following boilers.
- The HEDD universe should include all uncontrolled combustion turbines, load-following boilers and prevent other sources from exacerbating the problem.

# HEDD Reduction Goals

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	



# HEDD strategy

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- Short term
  - Reductions from load following boilers appear to provide a prime opportunity for HEDD reductions
- Next phase
  - Behind the meter and smaller units contributing to the grid also provide opportunities for HEDD reductions



# Connecticut's challenge

- Big, old dirty units and uncontrolled jets
- Growing demand for AC
- Electric system reliability issues
  - Transmission
  - New generation
  - FCM
  - CT IRP and EE requirements
- Implementing new energy policy
- Summer peak demand



# Workplan

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- Stakeholder meetings: February 27, March 26 and April 23 at 9 am in Phoenix Auditorium.
- Preliminary draft HEDD regulation available for stakeholder review/discussion by June 2008.
- Accept stakeholder comments on draft HEDD regulation during June 2008.
- Draft HEDD regulation for proposal in September 2008.



# Questions??

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