

Background

High Electric Demand Day (HEDD) Initiative

- OTC initiative identified link between HEDD and high ground level ozone concentrations
- DEC committed to reduce NO_x emissions by 50.8 tpd on high electric demand days
- Established and new reduction efforts have been assessed and implemented

Established NO_x RACT Regulations

- Cement kilns (6 NYCRR Part 220)
- Iron and steel process sources (6 NYCRR Part 216)
- Coke oven batteries (6 NYCRR Part 214)
- General process NO_x sources (6 NYCRR Part 212)



More Recent NOx reduction efforts

NOx RACT, 6 NYCRR Subpart 227-2¹

- Stricter NOx emissions limits
- Applies to 799 boilers & 55 combined cycle CT's, no direct changes for simple cycle turbines (peakers)
- Estimated reductions of ~79 tpd of NO_x (from 2007 levels)
- Has impacted some peakers like Holtsville & Barrett, facilities which could not use system averaging

(1) NYSDEC NOx RACT RIS

Still Air Quality Issues, what else?

Peaking Units (combustion turbines)

- Peaking units have been identified as a significant of NO_x emissions in need of reductions.
- In NYMA 154 peakers installed prior to 1987 and 23 after (149 prior to 1975)
- Pre-1987 peakers are significantly less efficient than their older counterparts.

	NOx (tons)	Heat Input (MMBtu)	Gross Load (MWh)	Efficiency
Pre-1987 Peakers	1,345	5,880,519	425,018	24.8%
Post-1987 Peakers	44	4,651,613	526,185	38.6%
2011 - 2014 high ozone days				

Peaker Emissions Analysis

- Emissions were analyzed for 45 days between 2011-2015 with ozone levels above 75ppb.
- Pre and post – 1987 peakers were compared.
- Post-1987 peakers are >90% cleaner than older units and show the kind of control which is achievable.

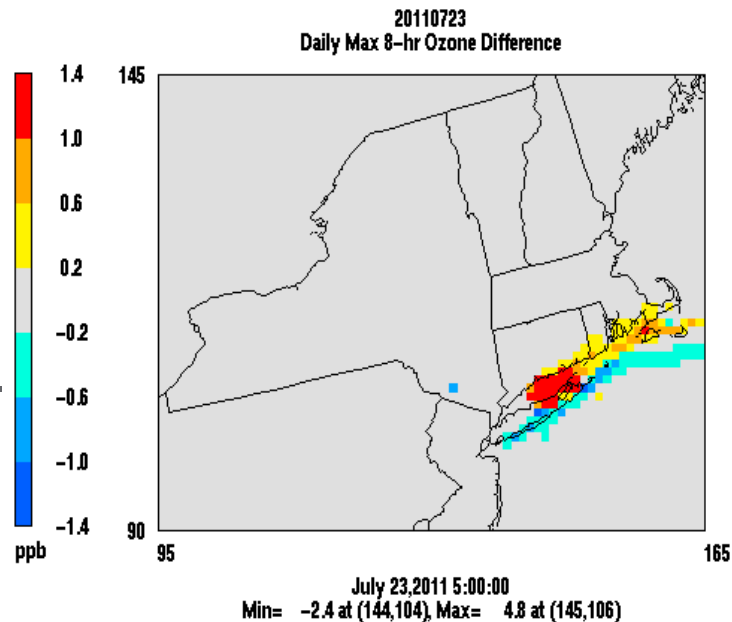
	Pre-1987 (lbs/MMBtu)	Post-1987 (lbs/MMBtu)	Pre-1987 (lbs/MWh)	Post-1987 (lbs/MWh)
2011 NOx Rate*	0.457	0.026	6.406	0.231
2012 NOx Rate*	0.458	0.020	6.590	0.174
2013 NOx Rate*	0.460	0.011	6.012	0.102
2014 NOx Rate*	0.421	0.010	6.195	0.089
*Rates for high ozone days				



Peaker Modeling Analysis - Ozone

- Peaking units were identified in EGU and peaking EGU modeling files.
- On a high ozone day shows a 4.8ppb contribution, which is estimated by the difference daily 8-hour max ozone between base case and zero-out peaking units case.

Ozone Contribution from NY Peakers



Conclusions

- Peakers emit significant NO_x emissions
- Most peakers were installed prior to 1987
- All peakers installed prior to 1987 emit NO_x at a significantly higher rate than those installed after 1987.