

**The Way Forward -  
Multi-pollutant Control of Coal  
Integrated Regulatory Strategy  
Where does Cap and Trade fit?**

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# Summary

## 1. Cap and Trade

- a. Optimal for CO<sub>2</sub>
- b. Works for NO<sub>x</sub> and SO<sub>2</sub> in combination with performance standards
- c. Not appropriate for hazardous air pollutants, except as interim step

## 2. Nitrogen Oxides (NO<sub>x</sub>)

- a. Ozone Season caps directionally correct
- b. Annual caps a step backwards
- c. Daily performance limits necessary

## 3. Mercury

- a. MSW 10 year experience relevant
- b. Fabric filters/carbon = 90% + control
- c. Fabric filter more cost effective than ESP
- d. Oxidation of mercury promising (with carbon or scrubbers)

## 4. Particulate Control

- a. Direct emissions underestimated – Factor of 10?
- b. Fabric filter for particulate HAP's (As, Cd)
- c. Fabric filter enables better mercury control

# N.J. Emission Trading Rules – Trial and Error

1. VOC Bubble Rule, revoked.
2. Emissions Offset Rule, in force.
3. NOx Budget Rule, in force.
4. Open Market Emissions Trading Rule, revoked.

# Mercury Focus

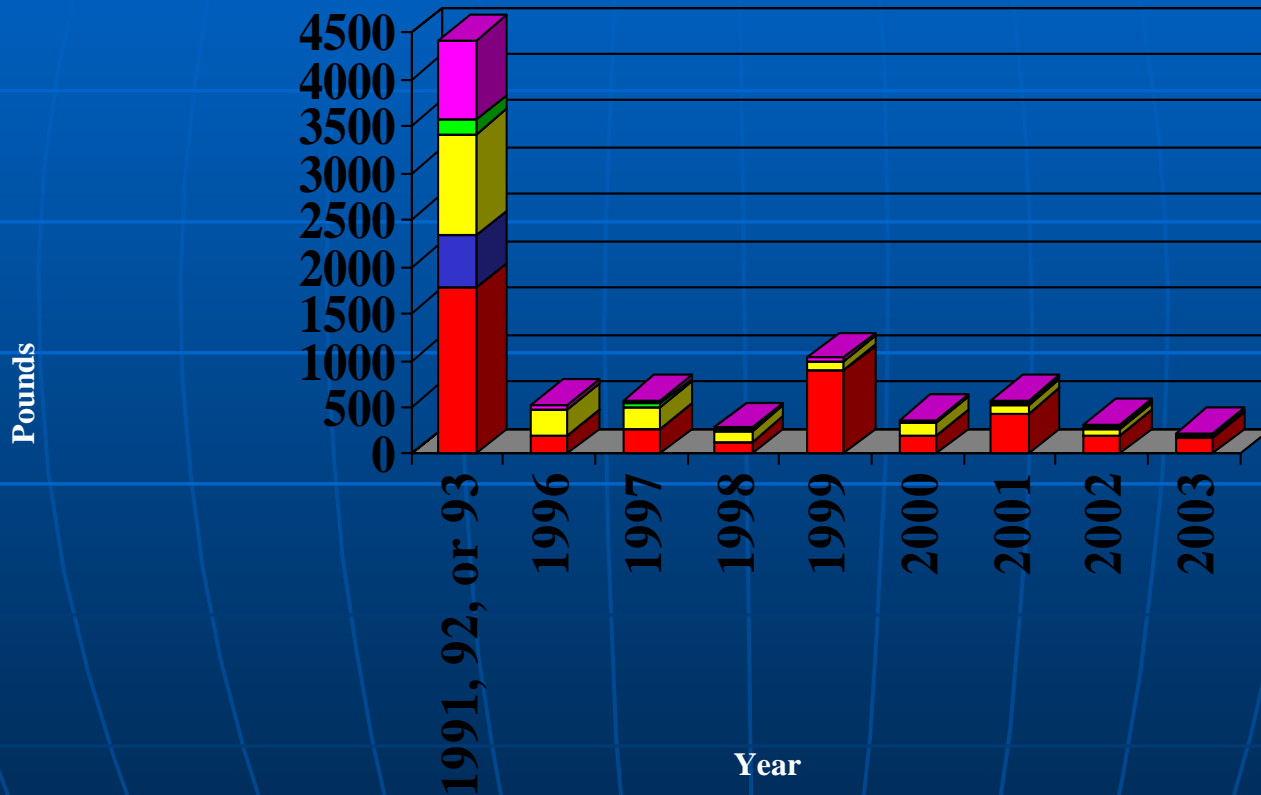
## 1. N.J. Municipal Solid Waste (MSW) Experience

- a. Carbon works
- b. Works best with fabric filter
- c. MSW more variable than coal

## 2. NJ Proposed Mercury Rule

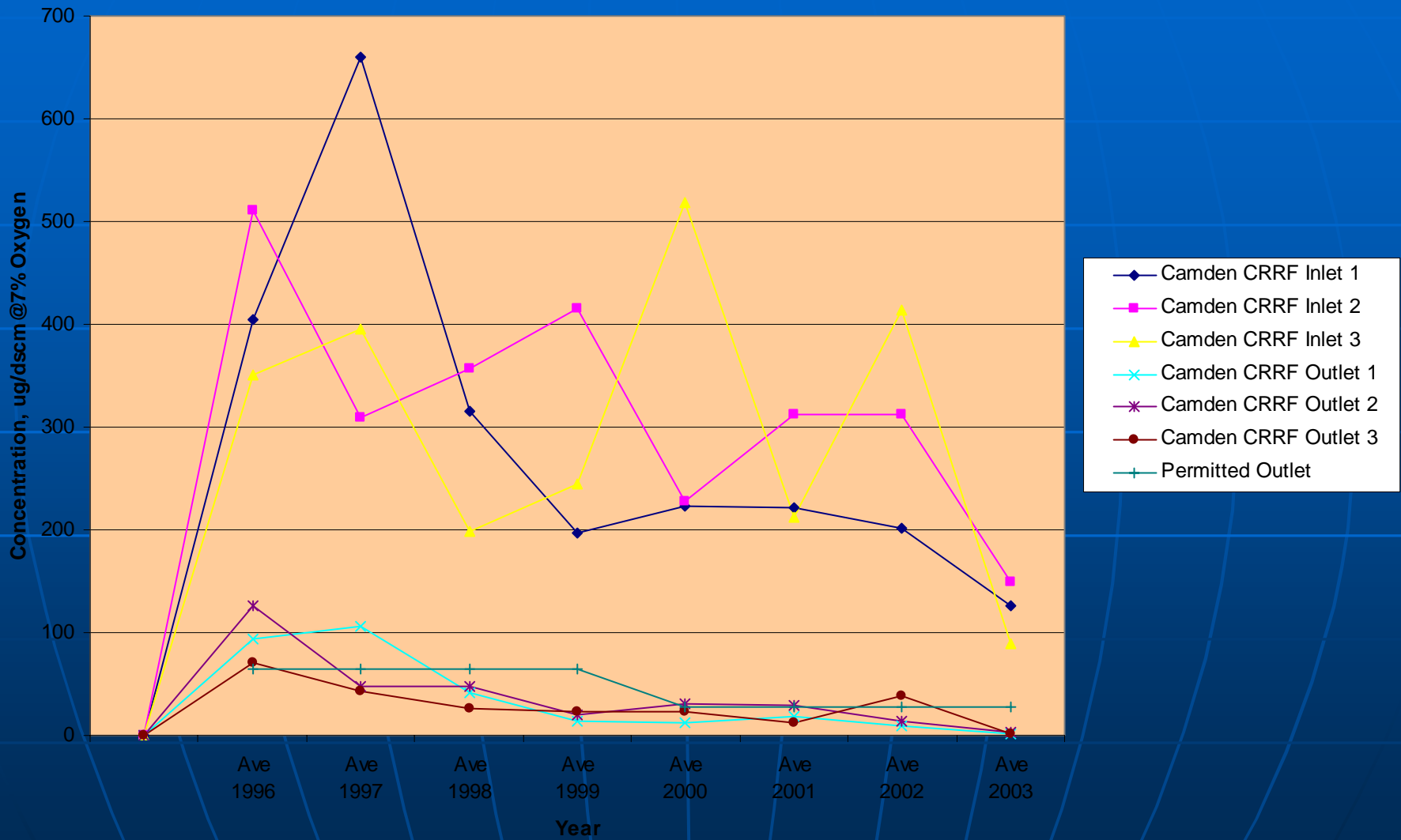
- a. Coal, Iron/steel, MSW, MWI
- b. Multi-pollutant incentive (5 years)

## Mercury Emissions from 5 Municipal Waste Incinerator Facilities in N.J.

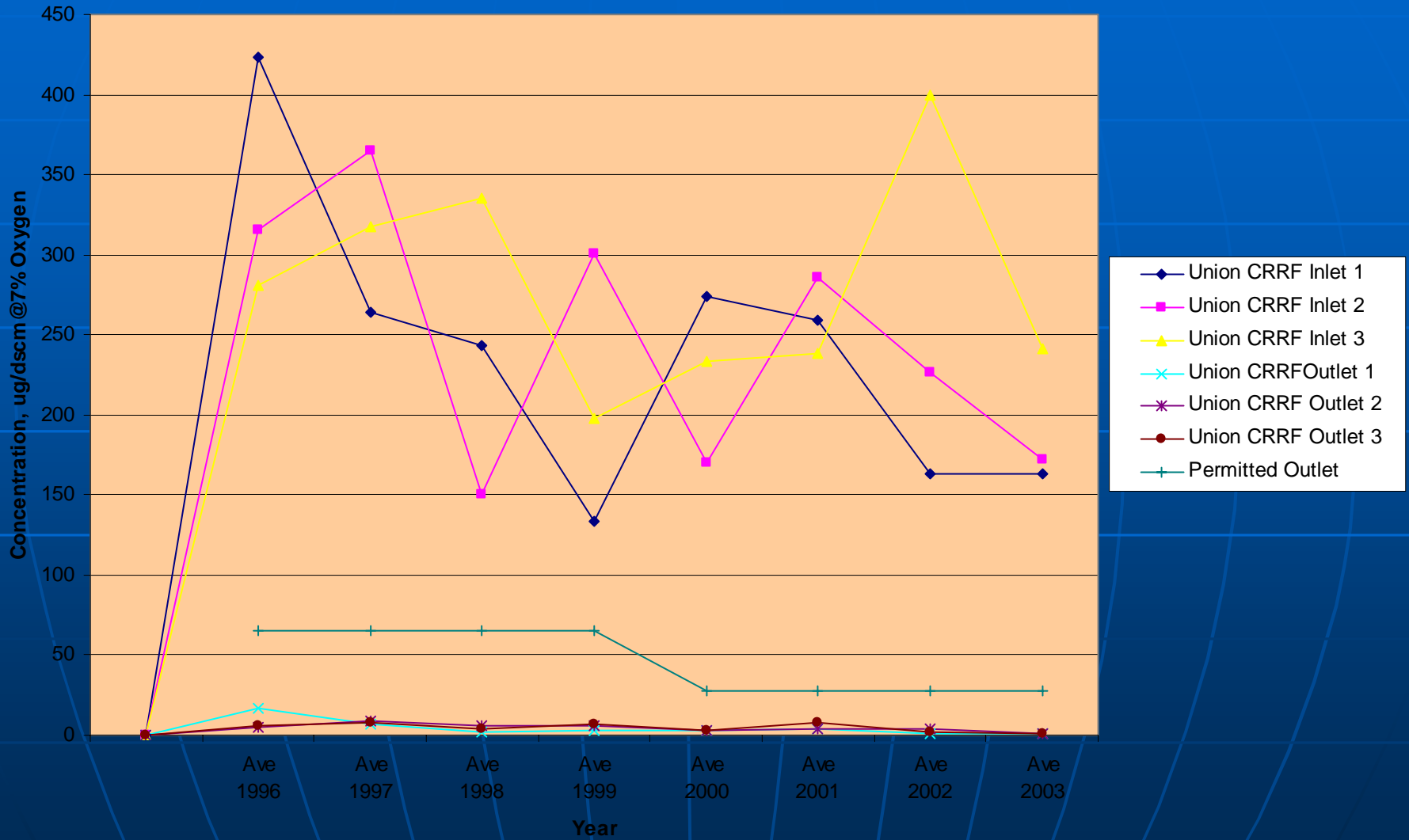


BASED ON AVERAGE EMISSIONS AT EACH FACILITY

### Camden CRRF Mercury Chart



### Union CRRF Mercury Chart

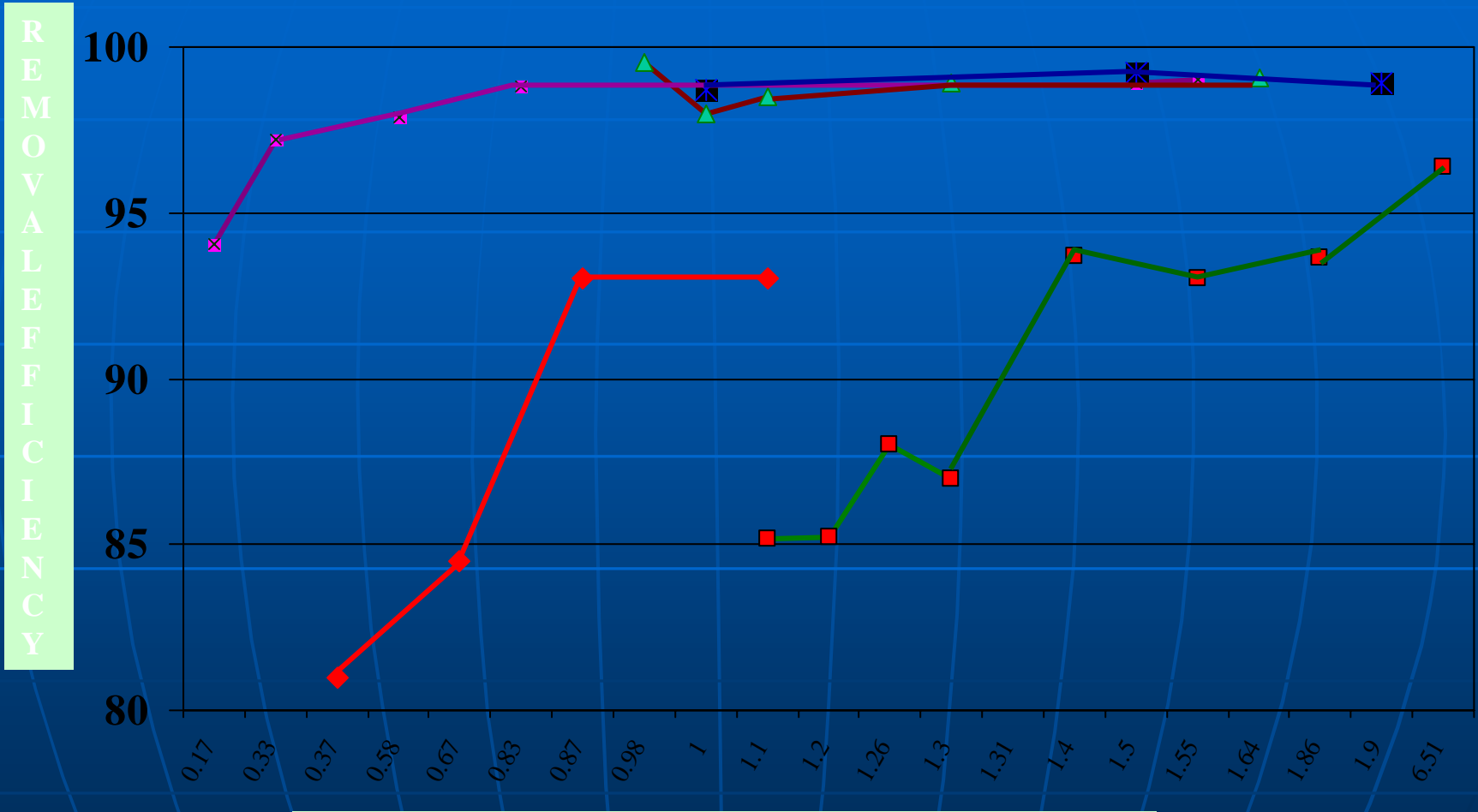


# Coal-fired boiler

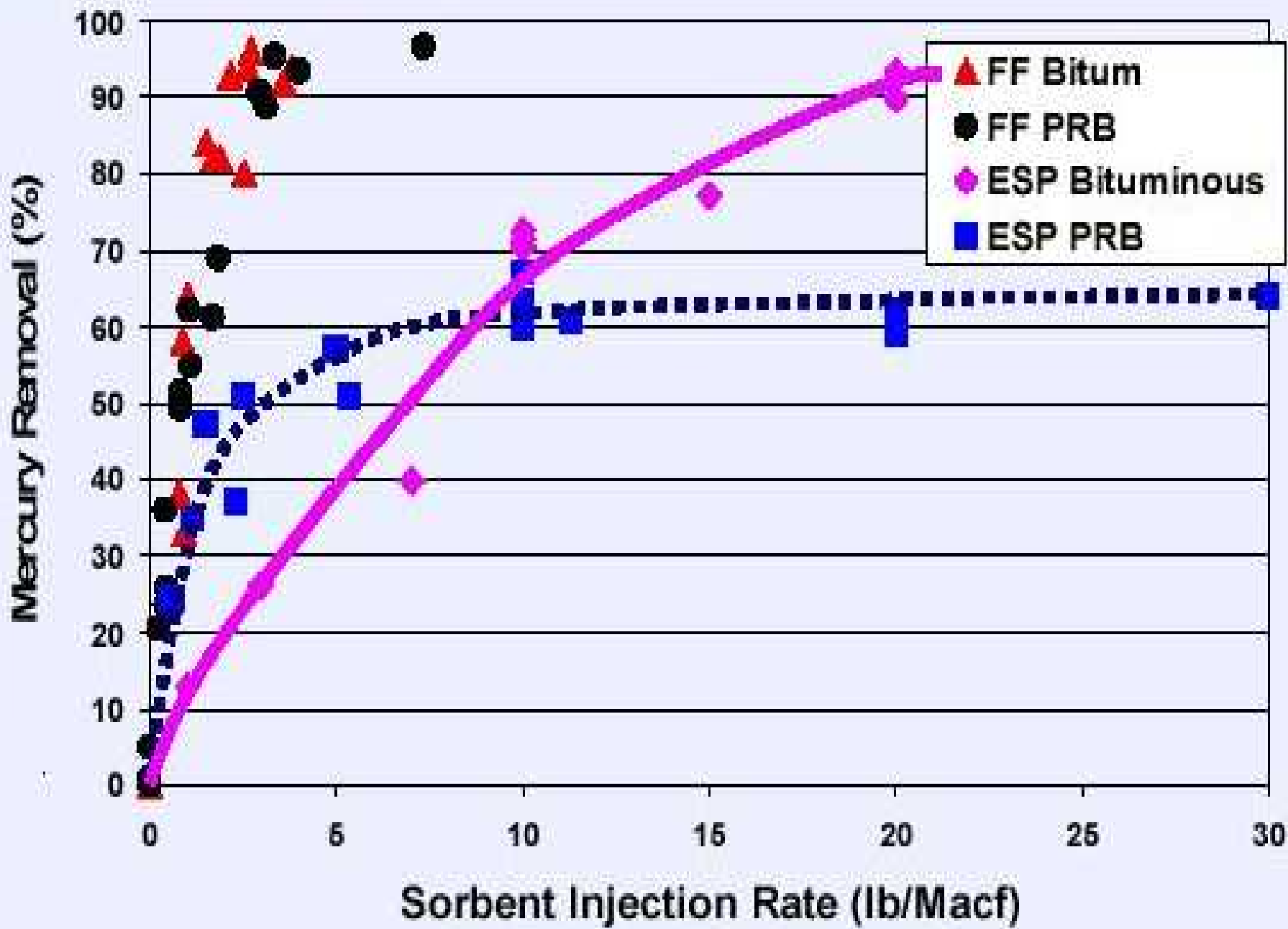
- December 15, 2007 - mercury emissions shall not exceed 3.00 mg/MW-hr; or
- Reduction efficiency for control of mercury emissions of the air pollution control apparatus shall be at least 90 percent;
- December 15, 2012 - an enforceable agreement with the Department by December 15, 2007, to install and operate multi-pollutant control systems by December 15, 2012;
  - nitrogen oxides  $\leq 0.100$  lbs/MMBTU (dry bottom utility boilers)
    - $\leq 0.130$  lbs/MMBTU (wet bottom utility boilers);
  - sulfur dioxide  $\leq 0.150$  lbs/MMBTU; and
  - particulate matter  $\leq 0.030$  lbs/MMBTU;



# BH VS. ESP ON MERCURY CONTROL



CARBON FEED RATE IN POUNDS PER TON OF MSW



# Hg Emissions for Activated Carbon Injection Combined with Additives

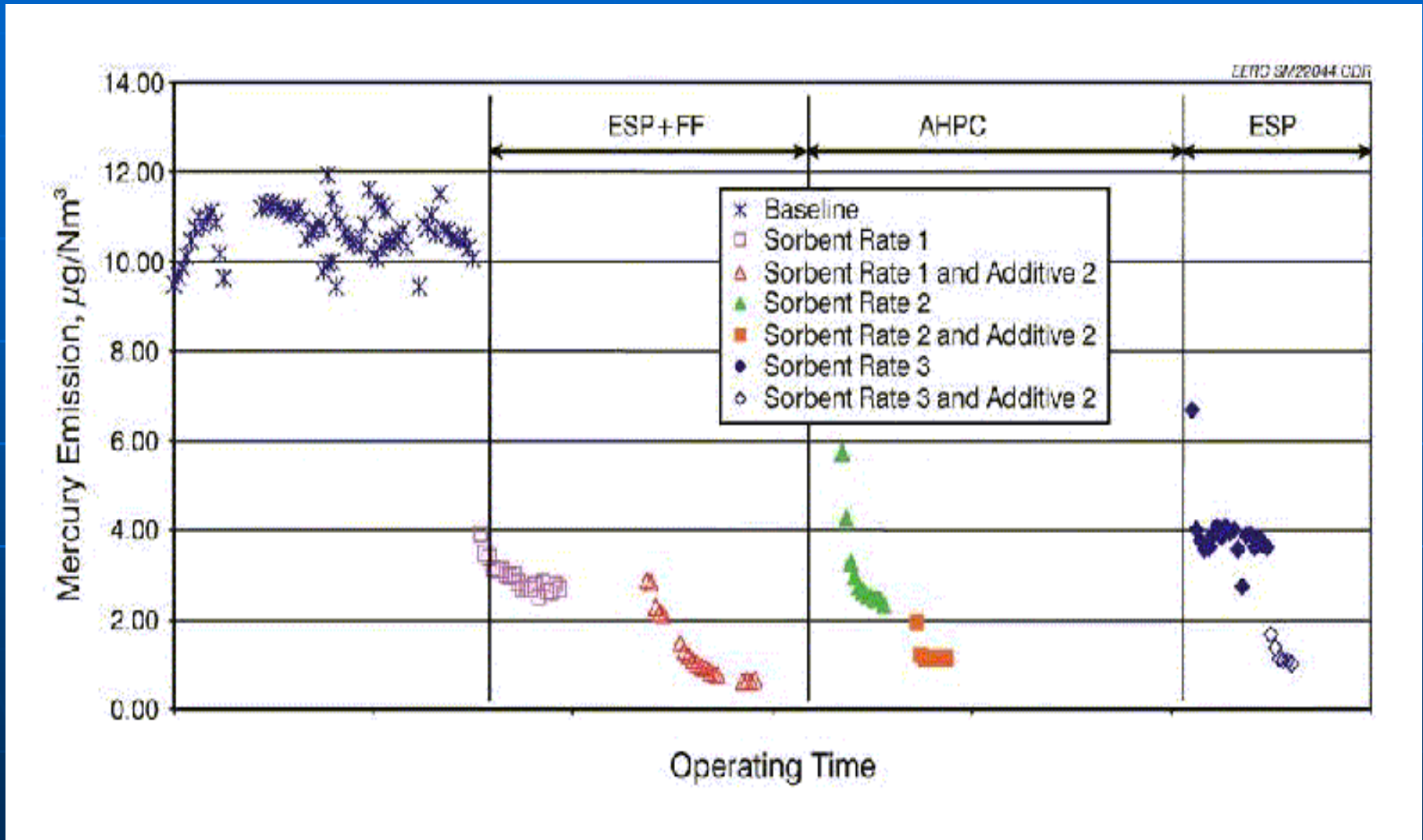


Figure 2 of the Jan-Mar 04 DOE/NETL Technical Progress Report, "Hg Control with Advanced Hybrid Particulate Collector

# Multi-pollutant Resolutions (Focus on Hg)

1. ECOS resolution 04-3, 4/20/04 regarding a Mercury Emission Rule
  - Require most aggressive mercury reductions achievable, in as early a timeframe possible
  - Preclude localized, adverse health or environmental impacts
2. OTC, 1/27/2004, Multi-pollutant Strategy
  - Mercury caps are interim measures (2008, 12)
  - Final compliance with performance standards (2015)
3. STAPPA/ALAPCO
  - 5/7/02 Principle for a multi-pollutant strategy for power plants  
“Cap emissions from power plants to establish the most stringent enforceable national emission reduction goals feasible, and to reflect the installation of technology no less stringent than best available controls on all existing units nationwide, with each existing power plant required to meet a minimum level of control by the final compliance deadline.”