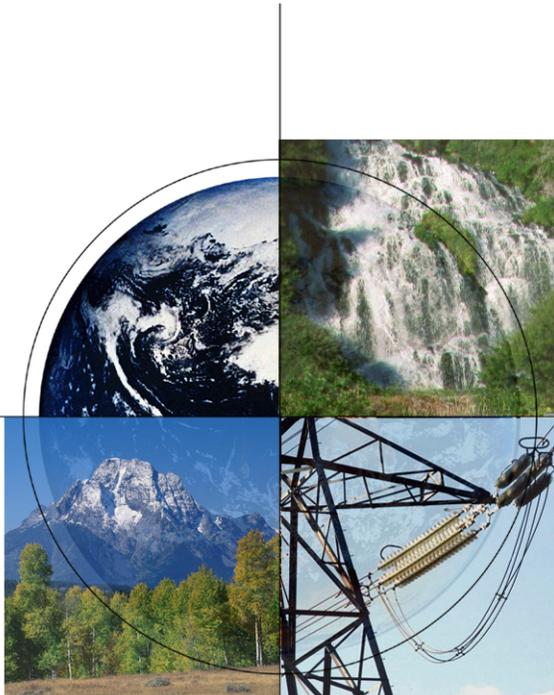


# U.S. DOE's Hg Control Technology R&D Program Review



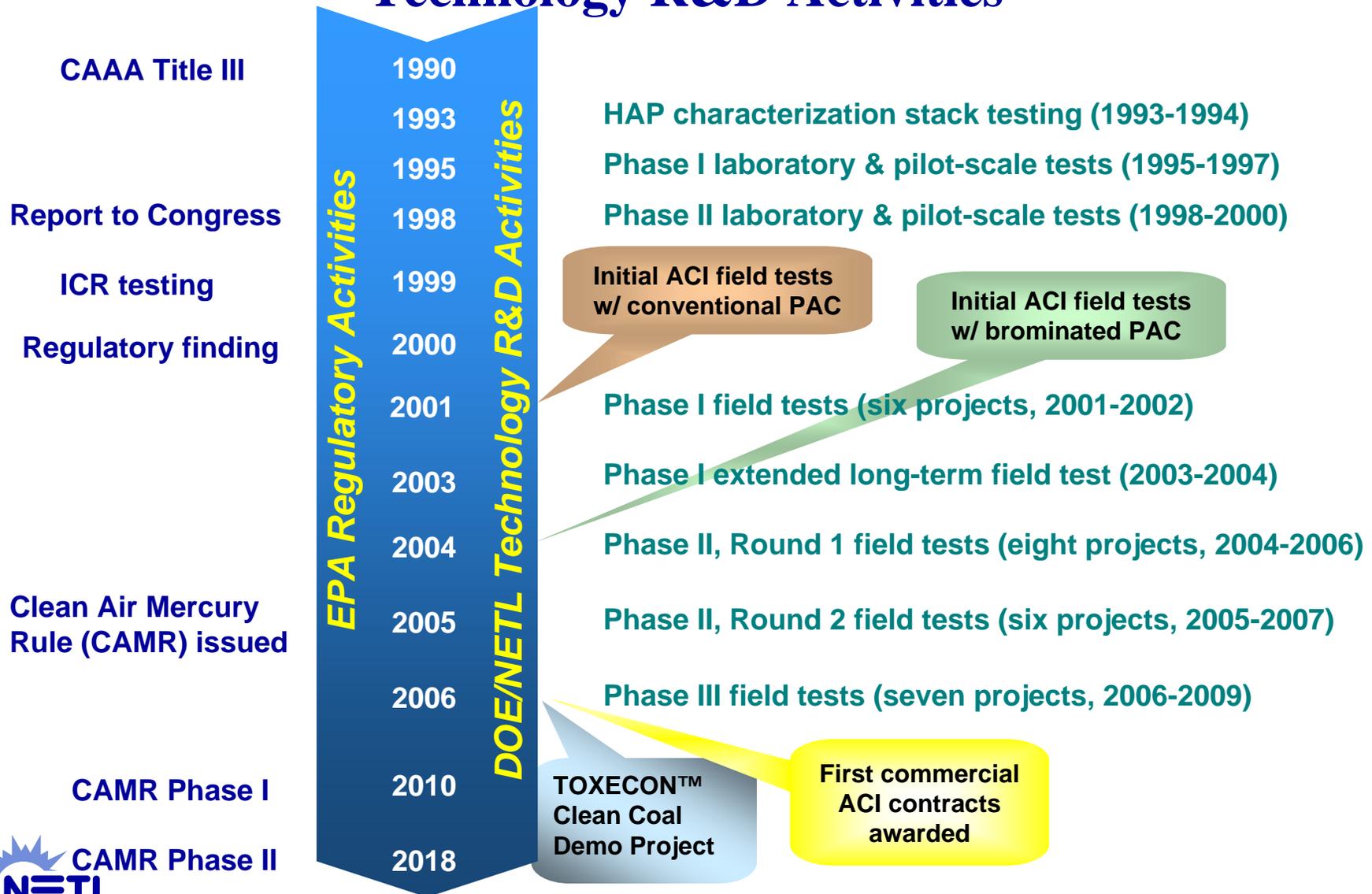
*December 11-13, 2006  
Pittsburgh, PA*

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**National Energy Technology Laboratory**



# Chronology of Mercury Control Regulatory & Technology R&D Activities



# Commercial Orders for Mercury Control Technologies

Size (MW)	Location	Prime OEM Contractor	Coal	APC Design	Hg Control	New Plant / Retrofit	Regulatory Driver
270	Midwest	Wheelabrator (Norit/ADA-ES)	PRB	TOXECON™	ACI	Retrofit	Consent Decree
250	East	Wheelabrator	Bituminous	SDA/FF	ACI	Retrofit	State Regulatory
250	East	Wheelabrator	Bituminous	SDA/FF	ACI	Retrofit	State Regulatory
650	East	Wheelabrator	Bituminous	ESP	ACI	Retrofit	State Regulatory
740	Midwest	B&W (ADA-ES)	PRB	SDA/FF	Br-ACI	New Plant	Construction Permit
550	Midwest	B&W (ADA-ES)	PRB	SDA/FF	Br-ACI	New Plant	Construction Permit
350	West	B&W (ADA-ES)	PRB	SDA/FF	Br-ACI	Retrofit	Consent Decree
350	West	B&W (ADA-ES)	PRB	SDA/FF	Br-ACI	Retrofit	Consent Decree
800	West	B&W (ADA-ES)	PRB	SDA/FF	Br-ACI	New Plant	Construction Permit
350	East	ADA-ES	Bituminous	ESP	ACI	Retrofit	Consent Decree
350	East	ADA-ES	Bituminous	ESP	ACI	Retrofit	Consent Decree
204	Midwest	Dustex	PRB	TOXECON™	ACI	Retrofit	Consent Decree
375	East	Wheelabrator	Bituminous		ACI	Retrofit	Consent Decree
650	Midwest	Alstom (ADA-ES)	PRB	SDA/FF	Br-ACI	New Plant	Construction Permit
215	Midwest	Powerspan	Bituminous	Multi-pollutant	ECO	Retrofit	Construction Permit
75	Midwest	Mobotec	PRB	CS-ESP	MinPlus furnace injection	Retrofit	Voluntary Regional Emission Abatement Plan (VREAP)
750	Midwest	Wheelabrator	High-S Bit.	ESP/WFGD/WESP	ACI	New Plant	Construction Permit
680	South	Alstom (ADA-ES)	PRB	SDA/FF	Br-ACI	New Plant	Construction Permit
107	East	BPI	Bit./Biomass	FT-SNCR/CDS/FF	ACI	Retrofit	DOE Demonstration
860	South	BPI	Lignite	SCR/FF/WFGD	Sorbent Injection	New Plant	Construction Permit
860	South	BPI	Lignite	SCR/FF/WFGD	Sorbent Injection	New Plant	Construction Permit
220	West	B&W (ADA-ES)	PRB	SDA/FF	Br-ACI	New Plant	Construction Permit
75	Midwest	Mobotec	PRB	CS-ESP	MinPlus furnace injection	Retrofit	VREAP
75	Midwest	Mobotec	PRB	CS-ESP	MinPlus furnace injection	Retrofit	VREAP



Source: Institute of Clean Air Companies

# Commercial Orders for Mercury Control Technologies (cont.)

Size (MW)	Location	Prime OEM Contractor	Coal	APC Design	Hg Control	New Plant / Retrofit	Regulatory Driver
575	Southwest	B&W (STC)	PRB/Western Bit. blend	HS-ESP/FF/WFGD	ACI	Retrofit	Construction Permit
575	Southwest	B&W (STC)	PRB/Western Bit. blend	HS-ESP/FF/WFGD	ACI	Retrofit	Construction Permit
335	Northeast	ADA-ES	Bituminous	CS-ESP	ACI	Retrofit	VREAP
550	West	Sorb-Tech	PRB	FF/WFGD	Br-ACI	Retrofit	Consent Decree
550	West	Sorb-Tech	PRB	FF/WFGD	Br-ACI	Retrofit	Consent Decree

**Over 12 Gigawatts of coal-fired capacity**



*Source: Institute of Clean Air Companies*

# Partnerships Key to Success!



BASIN ELECTRIC POWER COOPERATIVE



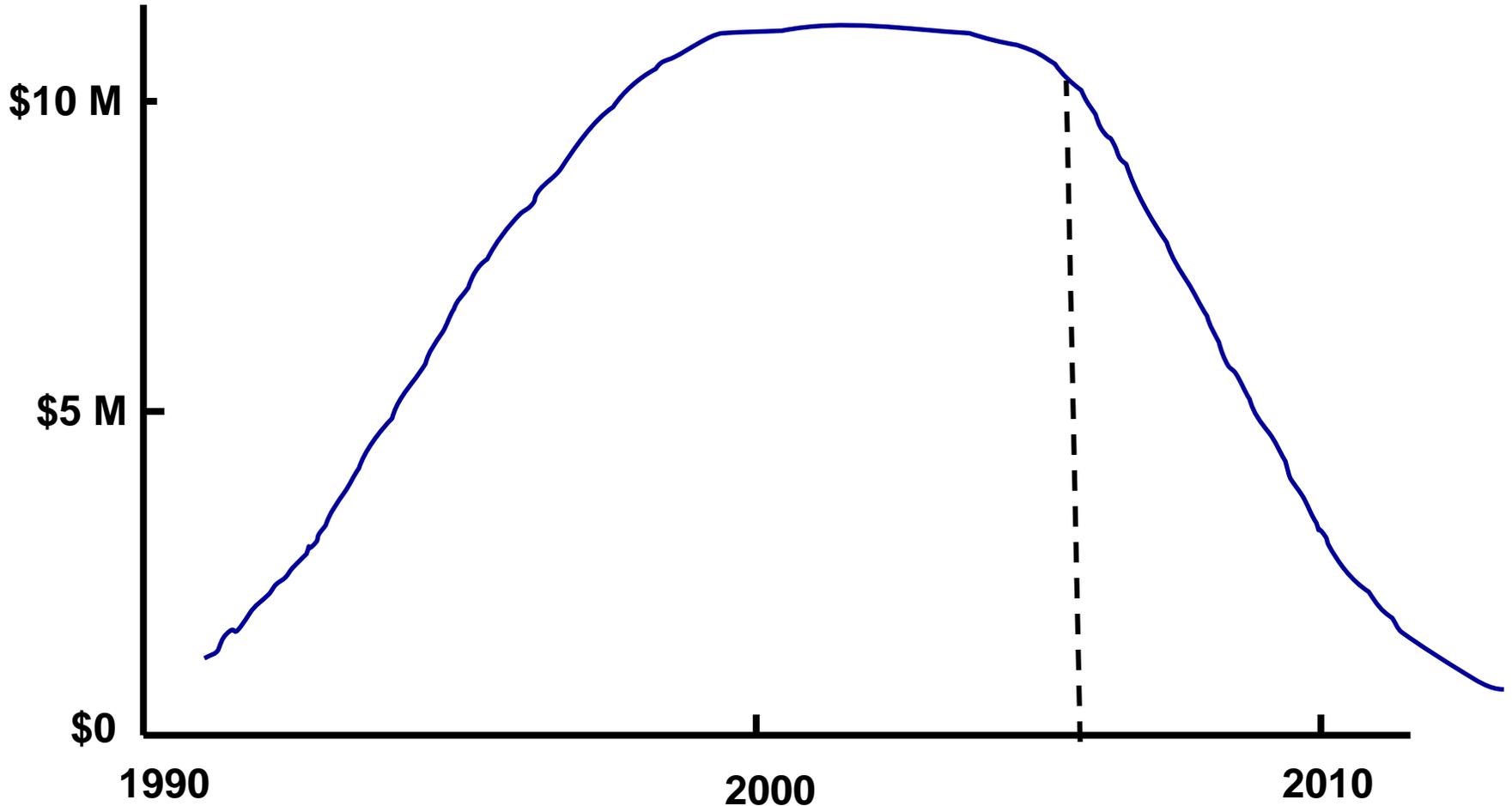
Host companies operate ~ 175 GW (54%) to total US coal-fired capacity

# But Technical/Performance Issues Remain...

- **Coal Utilization Byproduct (CUB) Impacts**
- **Mercury Re-emissions across FGD Scrubbers**
- **Increased Particulate Loading**
- **Acid Gas/SO<sub>3</sub> Interference with ACl**
- **High Temperature Mercury Capture**
- **Baghouse Impacts**



# Hg Research Funding Profile



# Future Plans

- **Issue FY07 competitive procurement directed at:**
  - Characterization of Hg speciation across low-oxidation SCR catalyst systems (full scale)
  - Assess impact of SO<sub>2</sub>/SO<sub>3</sub> on AC performance (lab and bench scale)
  - Develop advanced approaches for managing/sequestering Hg in CUB (lab and bench scale)
  - Assess Hg and other trace metal release and control in FGD wastewater



# Mercury Control Technology Program

- Have technologies ready for commercial demonstration by:
  - **2007 for all coals that can reduce “uncontrolled” Hg emissions by 50-70%**
  - **2010 for all coals that can reduce “uncontrolled” Hg emissions by +90%**
  - **Reduce cost by 25-50% compared to 1999 baseline cost estimates (~\$60,000/lb)**
- Support national goal of 50% coal byproducts utilization by 2010 through research directed at characterization and management of mercury in fly ash, scrubber materials, and other solids and liquid effluents

