

# COMMENTS ON EMISSIONS STANDARDS, SCHEDULE PROPOSED IN INTERIM WHITE PAPER

*Submitted By*

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# OUTLINE OF PRESENTATION

- Objective
- Definition of Control Scenarios
- Description of Assumptions, Modeling System
- Background (CAIR) Projection
- Results: 5 scenarios (EG1, EG2)
- Consent Decree, New Unit Rate
- Schedule: 2009 Feasibility

Note: Details In *UARG/MOG Comments on Interim White Paper*, anticipated March 21

# OBJECTIVE OF STUDY

- Evaluate compliance and marginal costs for CAIR and five NO<sub>x</sub>/SO<sub>2</sub> control scenarios
- Review of new plant and retrofit BACT analyses

# NO<sub>x</sub>/SO<sub>2</sub> CONTROL SCENARIOS: 2013

Scenario	NO <sub>x</sub> (lbs/MBtu)	SO <sub>2</sub> (lbs/MBtu)
Base/CAIR	0.152	0.41
One	0.125	0.35
Two	0.125	0.25
Three	0.12	0.20
Four (EGU 1)	0.10	0.15
Five (EGU 2)	0.07	0.10

# CONTROL SCENARIOS (CONT.)

- Affected Units – Fossil Units >25 MW That Sell Electricity To The Grid
- Designated Emission Rates are **System-Wide** Rates within the five states
- No Banking, Trading Of Allowances Between Different Systems
- System-wide Averaging Allowed To Achieve System Emission Rates

# EMISSIONS-ECONOMIC MODELING SYSTEM

- Determines a least cost solution for a specific utility system under a specific regulatory regime
- Evaluates a combination of compliance options (technology cost vs allowance prices) at the unit level
- Allocates allowances to affected units (e.g., CAIR allowances)
- Provides a feed-back mechanism to re-adjust emissions based upon compliance decisions
- Incorporate an extensive data base of unit design and operational data

# MODEL INPUTS AND CONTROL ASSUMPTIONS

- EIA AEO 2005 regional generation forecasts and regional fuel prices

# CONTROL TECHNOLOGY COST, PERFORMANCE ASSUMPTIONS

Cost Factor	FGD: 90-95% SO <sub>2</sub>	FGD: +3-4% SO <sub>2</sub>	SCR: to 88% NO <sub>x</sub>	SNCR: to 35% NO <sub>x</sub>
Capital: \$/kW	160-250	+2	80-180	10-18
Fixed O/M: \$/kW-y	5% capital	n/a	0.75% capital	n/a
Var O/M: mills/kWh	0.7-2.2	+0.25	0.6-1.05	0.4-1.3



# 5-STATE REGIONAL BACKGROUND

- By end of 2009 there will be 84,177 MW of coal-fired capacity operating in 5-State Region.
- By end of 2009 SCRs will be installed on 37,478 MW of region's coal-fired capacity.
- By end of 2009 FGDs will be installed on 25,995 MW of the region's coal-fired capacity
- By end of 2009 43% of the region's coal-fired capacity will be burning PRB or a PRB blend

# 5-STATE SO<sub>2</sub> & NO<sub>x</sub> EMISSIONS:2003 & 2009

Parameter	2003	2009
Heat Input: TBtu	4,817	5,953
NO <sub>x</sub> : tons	921,884	902,327
NO <sub>x</sub> : lbs/mmbtu	0.38	0.30
SO <sub>2</sub> : tons	2,896,631	2,606,426
SO <sub>2</sub> : lbs/mmbtu	1.20	0.87

# PRELIMINARY SO<sub>2</sub> COMPLIANCE COSTS: 2013 (in 2003 \$)

Scenario	Marginal Cost (\$/ton)
CAIR	1,151
Scenario 1	
Scenario 2	
Scenario 3	
Scenario 4 (EGU 1)	2,285
Scenario 5 (EGU 2)	3,300

# PRELIMINARY NOX MARGINAL COSTS: 2013 (in 2003 \$)

Scenario	Marginal Cost (\$/ton)
CAIR	2,320
Scenario 1	
Scenario 2	
Scenario 3	
Scenario 4 (EGU 1)	3,315
Scenario 5 (EGU 2)	>5,000

# TIMING: IS 2009 FEASIBLE?

- Detailed Study Conducted in July 2004  
Re: CAIR 2010 Timing
- CAIR: 44 GW SCR, 46 GW FGD by 2010
- Optimistic Start Date: SIP Plans Final By 1/1/06, Construction As Early As 10/06
- Schedule Driven by “Boilermaker” Availability

# TIMING (Cont'd)

- Used EPA Assumptions For Boilermakers
  - 28,000 total labor pool
  - Journeymen: Work 1685 hours annually
- Surveyed Utilities With Completed SCR, FGD To Determine Manpower
- Conclusion:
  - Requires Into 2011 To Complete Installation
  - 34 GW of Technology “Late”