



# Comparison of the Most Recent BACT/LAER Determinations for Combustion Turbines by State Air Pollution Control Agencies

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# Outline

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- Introduction
- Survey Procedures
- Results
- Conclusions



# Introduction

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- Need for current info on BACT/LAER determinations
- Survey of 23 State Air Pollution Control Agencies in the eastern half of the U.S.
- Focus on large (60 MW+) natural gas fired combustion turbines for power generation
- Evaluation of timeliness of info in EPA RACT/BACT/LAER Clearinghouse (RBLC)



# Introduction (Cont'd)

States Surveyed (\* information not provided)

Alabama	Massachusetts*
Arkansas	Michigan
Connecticut	Mississippi*
Delaware	New Hampshire
Florida	New Jersey*
Georgia	New York
Illinois	North Carolina
Indiana	Pennsylvania
Kentucky	Rhode Island*
Louisiana	South Carolina
Maine	Tennessee
Maryland*	



# Survey Procedures

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- Questionnaire on State Agency Experience in BACT/LAER determinations
- 3 most recent BACT/LAER determinations
- Simple/combined cycle natural gas fired combustion turbines



# Survey Procedures (cont'd)

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- Questions
  - BACT/LAER determinations
  - Compliance averaging time
  - Types of control technologies
  - Cost per ton removed threshold for economic feasibility
  - Total # of BACT/LAER determinations in the last 12 months



# Survey Procedures (cont'd)

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- Pollutants
  - PM10
  - NO<sub>x</sub>
  - CO
  - SO<sub>2</sub>
  - Hydrocarbons (VOC)



# Results

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- 18 of 23 states responded to survey
- Determinations obtained for all five pollutants
  - BACT – 144
  - LAER - 17



# Results (cont'd)

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- BACT determinations
  - NO<sub>x</sub>
    - 3.5 – 9.25 ppm
  - CO
    - 4.5 – 25 ppm
  - SO<sub>2</sub>
    - 0.0006 – 0.006 lb/MMBtu
  - PM<sub>10</sub>
    - 0.0055 – 0.021 lbs/MMBtu
  - VOC
    - 0.7 – 6.7 ppm



# Results (cont'd)

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- LAER determinations
  - NO<sub>x</sub>
    - 2.0 – 3.0 ppm
  - CO
    - 2.0 ppm
  - PM<sub>10</sub>
    - 0.0155 lb/MMBtu
  - VOC
    - 1.3 – 1.56 ppm



# Results (cont'd)

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- Compliance averaging times for BACT/LAER determinations
  - NO<sub>x</sub>
    - 1 hour – 12 month rolling average (combined with 3 hour averaging time)
  - CO
    - 1 hour – 30 day rolling average
  - SO<sub>2</sub>
    - 1 hour – 3 hour rolling average



# Results (Cont'd)

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- Compliance averaging times for BACT/LAER determinations
  - PM10
    - 1 hour – 24 hour rolling average
  - VOC
    - 1 hour – 30 day rolling average



# Results (cont'd)

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- Control technologies
  - NO<sub>x</sub>
    - SCR
    - DLNB
  - CO
    - Good/Efficient combustion
    - Catalytic Oxidation



# Results (cont'd)

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- Control technologies
  - PM10
    - Good/Efficient combustion
  - VOC
    - Good/Efficient combustion
    - Catalytic Oxidation



## Results (cont'd)

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- BACT determinations average cost per ton for economic feasibility
  - NO<sub>x</sub> (4 States)
    - \$2,606 - \$12,485
  - CO/VOC (1 State)
    - \$3,373



# Results (cont'd)

## BACT/LAER Determinations in RBLC

State	Pollutant	BACT/LAER Determinations in This Survey	BACT/LAER Determinations from Survey that are in U.S. EPA's RACT/BACT/LAER Clearinghouse Database	Percentage of BACT/LAER Determinations from Survey that are in U.S. EPA's RACT/BACT/LAER Clearinghouse Database
Alabama	NO <sub>x</sub>	3	0	0
	CO	3	0	0
	PM <sub>10</sub>	3	0	0
	VOC	3	0	0
Arkansas	NO <sub>x</sub>	3	2	66.6
	CO	2	2	100
	PM <sub>10</sub>	1	1	100
	VOC	2	2	100



## Results (cont'd)

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- Only 14% of the BACT/LAER determinations in this survey were included in the U.S. EPA RBLC database



# Conclusions

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- Significant differences by state
  - BACT/LAER determinations
  - Compliance averaging time
  - Average cost per ton of pollutant removed for economic feasibility
- Similarities by state
  - Control technologies
- Results indicate not all current BACT/LAER determination are available in RBLC