Addressing Regional Haze Pollutants from Industrial Boilers

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Process Overview of a Pulp and Paper Mill
Power Boiler
Paper and Pulp Mills

- Paper and pulp mills are large, complex, with integrated manufacturing operations
- Highly regulated with numerous applicable technology and air quality-based standards
- Produces 60% of energy needed through cogeneration (purchased energy down 53% since 1980)
- Since 1980, SO2 down 65%, NOx down 31%
- Environmental spending is 15% of total capital expense
- Leader in energy innovation and committed to environmental improvement
Pulp and Paper Mill Air Emissions Reductions

![Graph showing the reduction of Sulfur Dioxide (red bars) and Nitrogen Oxides (blue bars) from 1980 to 2000.](source: American Forest and Paper Association)
Global Competitiveness Issues for Paper and Pulp

- Cannot pass along cost increases because prices are determined by world market
- 90% of increased demand in paper products met by imports
- 100 mill closures in the last 6 years
- Expected growth of just 1% - anemic
Industrial Boilers are Different than EGUs

- Industrial boilers have varying designs and wide, rapid load swings to meet dozens of steam uses.
- Diverse fuel profiles (biomass, coal, tires, gas, black liquor often fired simultaneously in the same unit).
- Use of carbon-neutral biomass fuels for 60% of energy needs with potential to expand.
- Recycling activities (steam, paper, chemicals, water) making our industry very self-sufficient and efficient.
- Competing globally in product marketplace and desire to maintain strong domestic presence (top ten employer in 42 states).
- Small size (100-1000 MM Btu); a fraction of the EGU size (40 MW – 400 MW?).
MANE-VU Potential BART Industrial Boilers

- Out of the total of 38 potential BART Boilers:
  - 10 are universities or schools (MIT, Fernald Center, Boston College, Boston Univ., Northeastern Univ., Wellesly College, Williams College, Univ. of Medicine & Dentistry, US Military Academy, Brown Univ.)
  - 3 are hospitals (Deaconess Waltham Hospital, Medical Area Total Energy Plant, Umass Medical Center)
  - Logan Airport, Bell Labs
  - 23 are manufacturing or energy generators
Potential Controls for Industrial Boilers

- Some controls are not demonstrated – SCR for multi-fuel boilers for example
- Some controls may not be appropriate in retrofit situations due to space constraints
- Different economies of scale & cost per ton to control emissions – AF&PA analysis shows controls 2-3 times as expensive per ton on average compared with utilities, boilers that have made reductions could be even higher
- Some control cost estimates from RPOs seem low, especially for NOx controls
Regional Haze Considerations

- This is a rule based on esthetics – unimpaired views of the natural environment
- Boilers with visibility impact should be addressed, not necessarily every boiler
- Cost effectiveness is always important – not effective to mandate controls across a BART category
- MRPO, CENRAP & VISTAS also have problem Class I areas – a subset of Class I areas
- The VISTAS strategy to address its problem areas should be considered by MANE-VU
2018 OTWc Annual Reasonable Progress

VISTAS

Preliminary Results

- Yes
- No
- Maybe
- Undetermined
Limited Geography Analysis
Counties within 200km of GSMNP
Summary

- Controlling visibility impairing pollutants is the goal of BART, not installing controls
- Modeling a facility’s visibility impact should be an alternative for the facility
- VISTAS strategy for state compliance for Class I areas is reasonable
- Trading is a cost effective compliance strategy for regional haze
- Industrial boilers are different from EGUs – smaller, significantly lower emissions, many types of owners
- Remember the 5 factors to consider when making BART controls determinations
Thank you for this opportunity

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