

July 29, 2005

Mr. Mike Koerber
Executive Director
Lake Michigan Air Directors Consortium / Midwest RPO
2250 East Devon Avenue, Suite 250
Des Plaines, Illinois 60018

Re: Comments regarding "Interim White Paper – Midwest RPO Candidate Control Measures:
Source Category: Industrial, Commercial, and Institutional (ICI) Boilers (03/29/05)"

Dear Mr. Koerber:

These comments are being submitted on behalf of an ad hoc group of owners/operators of industrial, commercial, and institutional boilers (ICI boilers) located within Midwest RPO's (MRPO) member states. A list of participants is included at the end of this letter. We thank you for this opportunity to submit comments on MRPO's ICI Interim White Paper and hope that our comments will be useful to you in your consideration of air quality issues in the Midwest.

1. Comments Regarding Source Category Description

- **ICI boilers utilize a variety of fuels.** The owners and operators of ICI boilers seek to minimize fuel costs to the maximum extent possible. To that end, in addition to coal, oil, natural gas, and process gases, ICI boilers may routinely combust biomass (alone or in combination with other fuels) as well as industrial process byproducts for energy recovery. This fuel flexibility inherent in our sector allows us to take advantage of fuel sources that might otherwise be wasted. We ask that the MRPO take into consideration the wide variety of fuels our ICI boilers use as this is a characteristic of our source category that makes us different from the electric utility sector.
- **Most ICI boiler designs cannot accommodate wholesale fuel switching with ease.** The universe of ICI boilers includes combined heat and power (CHP) facilities that utilize large industrial boilers to provide steam and electricity to manufacturing complexes, university campuses, and district energy systems. Because of the diversity in fuels and inherent boiler design factors, fuel switching (i.e., from higher to lower sulfur coal) should not be viewed as an easy "first step". Boilers are designed to combust specific fuels. While fuel blending may be an option for a limited number of sources, there are economic factors that may render fuel blending impractical for others.
- **Consideration throughout the White Paper should be made to CFB boiler technology by acknowledging its significant environmental benefits and unique operational characteristics.** Circulating fluidized bed boilers are becoming more and more commonplace in ICI applications due to their inherently low NO_x and SO₂ emissions and the ability of the technology to accommodate a wide variety of fuels. For this reason, we feel it is imperative that the MRPO understand the CFB and its important

role in the ICI boiler fleet. The CFB boiler varies markedly from the more conventional pulverized coal and stoker fired boiler designs.

An excellent overview of CFB technology compared to conventional technologies is presented in: "Report to the U.S. Environmental Protection Agency on Fossil Fuel Combustion Byproducts from Fluidized Bed Boilers (CIBO, 1997)." The following is an excerpt from that report:

"...In fluidized-bed combustion, fuel is burned in a bed of hot incombustible particles suspended by an upward flow of fluidizing gas. Typically, the fuel is a solid such as coal or biomass, though liquid and gaseous fuels can be readily used. The fluidizing gas is generally the combustion air and the gaseous products of combustion. Where sulfur capture is not required, the fuel ash may be supplemented by inert materials such as sand to maintain the bed. In applications where sulfur capture is required, limestone is used as the sorbent and forms a portion of the bed. Bed temperature is usually maintained between 1,550°F - 1,700°F (800°C - 900°C) by the use of heat-absorbing surface within or enclosing the bed. This temperature is optimal for the chemical processes needed to capture sulfur and control NO_x emissions. It also avoids ash softening in nearly all fuels. At this temperature, efficient combustion can be achieved because of the relatively long residence time of fuel in the bed and the good gas/solids contact there...."

The major advantages for fluid bed combustion technology application to ICI processes are the following (CIBO, 1997):

"...**Fuel Flexibility:** Because temperature levels are held below the ash-softening level, the FBC boiler is not sensitive to fuel ash characteristics. A wide range of fuels with varying ash contents and properties can be burned in a single boiler. The high thermal inertia of the bed mass provides for stable ignition and combustion of very low grade fuels such as fuels high in ash and/or moisture. Fuels containing up to 70 percent ash and 50 percent moisture have been successfully burned in a fluid bed. The high thermal inertia of the bed also provides for good performance when firing low-volatile fuels such as anthracite, anthracite waste, and petroleum coke.

Low Emissions: Sulfur oxide emissions are controlled within the combustor by addition of a sorbent material, typically limestone, so a stack-gas SO₂ scrubber is not required. The sulfur sorbent also can react with and remove other fuel constituents such as vanadium, reducing down-stream corrosion potential. Nitrogen oxide emissions are considered to come from two sources: oxidation of nitrogen in the air (thermal NO_x) and oxidation of nitrogen and/or nitrogen components in the fuel (fuel NO_x). At the low temperatures in FBC, thermal NO_x production is essentially zero. Moreover, design features such as staged combustion can significantly reduce fuel NO_x leading to low total NO_x emissions...."

Though CFBs regularly achieve low NO_x emissions and high sulfur capture, any effort to reduce emissions by manipulating the original design characteristics stands to negate the

original reason a CFB was chosen for an application in the first place, thus potentially returning an otherwise usable fuel source to a waste occupying valuable landfill space.

- **Table 2 must be improved before any further modeling is conducted.** Though an interesting “first pass” at characterizing the population of Midwest ICI boilers, the assumptions used in construction of Table 2 makes it wholly inadequate as a base for regulatory assessment. Table 2 in the White Paper seeks to classify or categorize the ICI boiler universe by emissions only. It is imperative that the states and locals seek to refine their data before any additional work is done to model the source category.

2. Comments Regarding Regulatory History

- **The Regulatory Section of the White Paper is out of date.** The Midwest RPO must revise the "On-the-Way Regulations" section this White Paper to take into account the outcome of the final Clean Air Interstate Rule (CAIR) and the final rules implementing BART. With respect to the BART program, the EPA makes very important distinctions between EGU facilities with post-combustion controls for the NO_x SIP Call and those that do not. The EPA has determined that combustion controls are highly cost-effective for those EGUs that do not have post-combustion controls for NO_x; thus, it is unreasonable to assume that an SCR (achieving an 80% reduction) will be highly cost-effective for an ICI boiler that has not installed such controls for the NO_x SIP Call, regardless of the size of the ICI boiler.
- **The MRPO should be sure to take into account the impact of current unit level reductions.** The emissions inventory used to establish Table 2 may overstate SO₂ and NO_x emissions. The MRPO should include reductions realized for the NO_x SIP Call and also as a result of consent orders issued by the Department of Justice to owners/operators of ICI boilers within the region.

3. Comments Regarding Candidate Control Measures

- **MACTEC's generalizations miss the mark.** The White Paper uses as a reference a document prepared for the Midwest RPO by MACTEC that outlines control measures that may apply to BART-eligible units in the planning region. MACTEC has made generalizations of the applicability of control measures across the source categories that are inappropriate. For example, B&W manufactures an ultra-low NO_x burner, but this burner is only appropriate for application to a limited number of large gas-fired boilers; however, MACTEC has applied the stated emission rates to solid-fuel fired boilers, resulting in a control level which is unachievable.
- **Manufacturers' claims must be carefully evaluated before controls are broadly assumed to be appropriate for the ICI boiler category.** Many emerging technologies have been tested only on a limited number of boiler types and sizes, and the controls may not scale down to the ICI boiler category with its characteristic variability in size and fuels. There are limitations, as well, when specific operating parameters are taken into account, including boiler exhaust temperatures and stack gas flow rates.

- **EPA’s considerations for CAIR and BART must be acknowledged by the MRPO.** As previously stated, the Midwest RPO should evaluate their candidate control measures for ICI boilers in light of the EPA's final regulatory actions on CAIR and BART. The use of SCR for NOx has a limited applicability to the ICI boiler category as a result of many factors, including boiler design, operating conditions (capacity factor), and unit location. Many large industrial boilers are located in highly populated areas where the use of ammonia or urea may not be feasible as a result of facility space constraints.

4. Comments Regarding Cost Effectiveness and Basis

- **The cost effectiveness and basis does not account for the complexity of the ICI boiler population.** The White Paper refers to two documents from the CAIR docket that the EPA claims may be used to evaluate the cost of controls for the ICI category. These two documents should not be interpreted by the Midwest RPO to be the final evaluation of costs. For example, the SO₂ controls document indicate that wet FGD technology (achieving 90% control) is appropriate for the category, and that it can be constructed in less than one year on an ICI boiler. There are many fallacies associated with this notion.
 - First, and foremost, technologies like selective catalytic reduction and wet-FGD have a limited applicability to the ICI category. Many ICI boilers are constrained by location and options for management of the required reagents and byproduct scrubber sludges, rendering the cost of control orders of magnitude beyond highly cost-effective.
 - Second, assigning a mere one year construction timeline for installation of major pollution control equipment for an ICI boiler is unrealistic at best. Most ICI boilers serve processes and/or customers that cannot withstand an interruption in service. Our facilities are generally operated 24 hours per day on a year-round schedule. The steam provided by our plants cannot be purchased from a “grid” like electricity could be purchased during the downtime of a utility boiler. We must keep our plants on line throughout construction, doing work in carefully scheduled outages during low demand times of year, taking into consideration the needs of the end-user, as well as equipment procurement and delivery schedules. This requirement for “staging” major equipment installation project extends the life of a project to the order of several years, not the single year as EPA suggests.
 - Third, because the ICI boiler owners and operators are competing for resources (labor and materials) with the EGU category, there are likely to be impacts and delays in engineering, materials procurement, etc., going forward.
 - Fourth, many ICI boilers in the planning region are owned and operated by municipal or government entities that have both complex fund allocation requirements and limited funds available to them. If the funds are not available through general appropriations, then user fees must be established or raised in order to provide sufficient funds for control technologies.

- **The candidate control measures are real options for only a few ICI boilers.** The Midwest RPO must evaluate the three proposed candidate control measures in light of these issues, as it is likely that the proposed 80% NO_x and 90% SO₂ reductions are only achievable on a few ICI boilers. Attempting to do a one-size-fits-all approach for the source category fails to recognize the diversity of the category (boiler types and fuels), and increases costs. The classifications and subcategories in the ICI Boiler MACT and its effort to not create a regulation where the only real option is to switch to burning gas, is an example of how a regulation can take this into account.
- **Cost effectiveness and basis must fully consider the impact on non-traditional fuel use and alternative energy supply now offered by facilities currently using CFB technology.** As mentioned previously in these comments, it is imperative that the MRPO consider the universe of CFB boilers in its examination of the ICI fleet. CFB boilers use wastes from many industries as fuels. The technology is also one of the only technologies that can easily burn unmarketable high sulfur Illinois basin coals. We are concerned that poorly thought out control measures and short sighted regulations have the potential to return entire fuel classes back to being wastes again: return of sludges to landfills, inhibition of coal mines and coal processing facilities reclamation, elimination of the market for high sulfur Illinois basin coal are examples. Additionally, under the MRPO's ICI White Paper control scenarios, facilities that currently depend on nontraditional fuels might not only have to switch to traditional fuels (further burdening the traditional energy market), but would have to completely replace the units designed to fire non-traditional fuel with more conventional firing technology thus causing a significant economic impact to the region.

5. Comments Regarding Timing of Implementation

- **Timing must coordinate with ICI Boiler MACT compliance.** Many facilities in the ICI boiler category are currently planning for compliance with the ICI boiler MACT, due in 2007. It is imperative that any future regulatory programs integrate with the ICI Boiler MACT standard, and allow owners/operators to integrate future controls with those installed for MACT. The Midwest RPO suggests that a regulation could be adopted in early 2007 and implemented by 2009. This aggressive schedule fails to take into account the time needed for acquisition of funding, engineering a retrofit design on existing boilers, and the procurement of long-lead time parts and materials.
- **Scheduling is complicated; many ICI boiler installations require that work be performed "on line".** As mentioned previously, the implementation schedule is further complicated by the fact that there is no "grid" to support the load demands of the facilities served by the ICI boilers, thus outages for demolition and construction must be well coordinated with process outages and customer needs to ensure that demands are satisfied.
- **Regulations should only require reductions that are cost-effective to achieve.** Implementing regulations that stretch the limits of the technology are likely to force owners to consider fuel switching -- with the demand constraints on the domestic natural

gas supply, regulatory agencies should encourage ICI boilers to find ways to utilize all fuels, especially those that are currently in use. Again, as mentioned previously, many ICI boilers (in particular CFBs) currently fire fuels that utilities are unable to use, thus diversifying the region's energy supply fuel base.

Thank you again for your consideration of the comments we offer. Please don't hesitate to contact any of the companies identified below should you have questions.

Sincerely,

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These comments are submitted on behalf of:

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Citizens Thermal Energy
The Council of Industrial Boiler Owners
Peru Utilities
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