

**DTE Energy<sup>®</sup>**



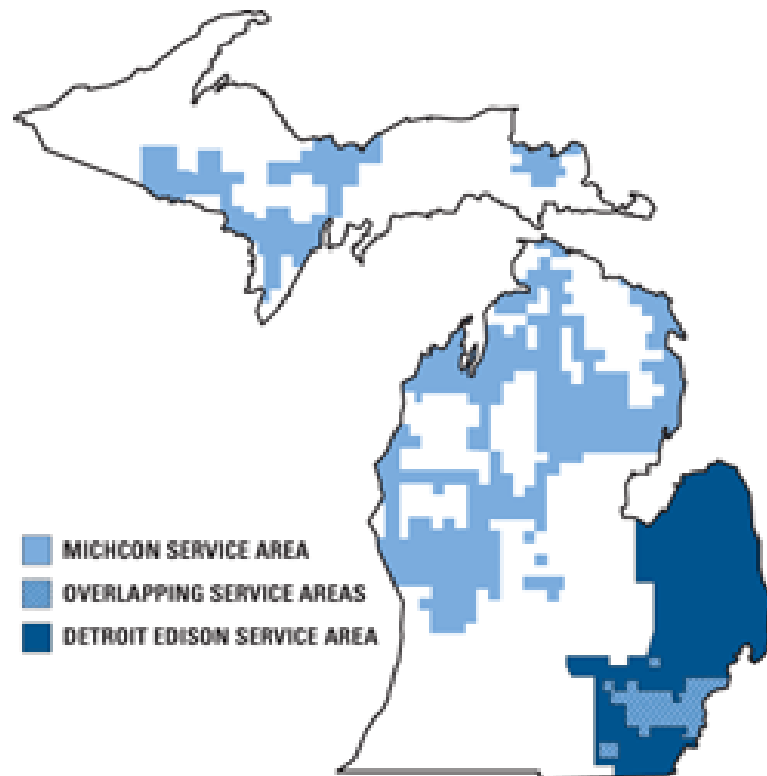
## **Complying with the Industrial Boiler MACT and Related Rules**



**Lillian Woolley  
October 25, 2011  
Air & Waste Management Association**



# DTE Energy



- Detroit Edison provides electricity to 2.1 million customers, and operates an electrical system with 11,084 MW capacity.
- MichCon provides natural gas storage, distribution, transmission and sales to 1.2 million customers.
- Both own/operate boilers potentially subject to these rules.



## But what happened with the rules?

### **EPA Announces Timeline for Reconsideration of Air Toxics Standards for Boilers and Certain Incinerators**

June 24, 2011 - As part of a filing with the US Court of Appeals for the DC Circuit, the EPA has set a schedule for issuing updated air toxics standards for boilers and certain solid waste incinerators. To ensure that the agency's standards are based on the best available data and the public is given ample opportunity to provide additional input and information, the agency will propose standards by the end of October 2011 and issue final standards by the end of April 2012.

**Area Sources:** On May 18, 2011, EPA published a notice delaying the effective date of the *major source* (or "boiler MACT") rule only. The requirements for area source boilers are still in effect.

**Solid Waste:** The revised "definition of solid waste" is also still in effect, as outlined in 40 CFR Part 241.2 .



# Overview



- Area Source Industrial Boiler MACT Compliance
- Solid Waste Definition Changes
- Permitting Issues
- Preparing for the Major Source IB MACT

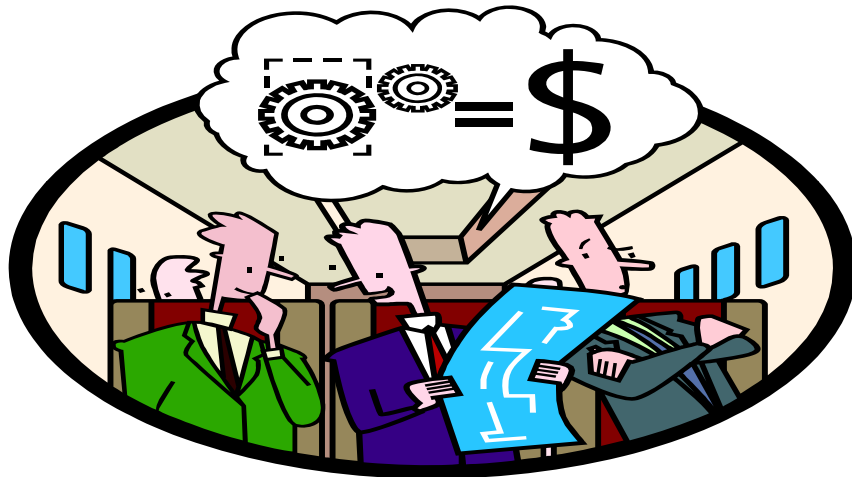


## CIBO Observations:

- EPA's final rule as published, but now under reconsideration, is not achievable.
- For example, though the Clean Air Act specifies standards for existing units shall not be less stringent than the average emissions limitation achieved by the best performing 12% of existing sources for which EPA has emissions information, only 31 units out of 1594 (<2%) existing major source solid and liquid fuel boilers are able to comply as currently operated.
- And not one single operating 100% solid fuel unit in the country is shown to be capable of complying with the standards for new units despite the Clean Air Act requirement that the new source standard be not less stringent than the emission control achieved in practice by the best controlled similar source.



## IB MACT for Area Sources



- The Area Source Standard was not suspended.
- The first notification date was September 17, 2011.
- First tune-ups are required by March 21, 2012.
- Energy assessments are required by March 21, 2014.



## Area Source Requirements

### Large units

- No requirements for gas-fired units – not covered by rule
- Oil-fired units - tune-up every other year, one time energy assessment
- Biomass – tune-up every other year, one time energy assessment

### Small units

- Coal, Biomass and Oil-fired units - tune-up every other year



## Standards for Coal-fired Boilers

### Existing Boilers

- CO limit 400 ppm (stack test)
- Hg limit  $4.8 \times 10^{-6}$  lb/mmbtu (stack test)

### New Boilers

- PM limit 0.42 lb/mmbtu (stack test)  
PM limit (> 30 mmbtu/hr) 0.03 lb/mmbtu
- Hg limit  $4.8 \times 10^{-6}$  lb/mmbtu (stack test)
- CO limit 400 ppm

\* *Oxygen and operating parameters are limits*



## Area Source Operating Parameter Requirements

Stack testing is showed to use compliance – but the following are also required:

- Only burning the fuel types and fuel mixtures used to demonstrate compliance with the applicable emission
- Keeping monthly records of fuel use.
- Continuously monitor the oxygen content in the combustion exhaust and maintain the 12-hour average oxygen content at or above the operating limit established during the most recent carbon monoxide performance test.



## Emission Limits? Ongoing responsibilities?

- Conduct initial performance test and establish operating parameters.
- Repeat performance tests every 3 years.
- Develop and follow a site-specific testing plan and site-specific monitoring plan.
- Conduct initial and monthly fuel analysis for each type of fuel.
- Minimize the boiler's startup and shutdown and follow the manufacturer's recommended procedures for startup and shutdown.
- Monitor and collect data to demonstrate compliance with operating limits.
- Maintain monitoring systems.



# Tune-up Requirements

(b) You **must conduct a tune-up** of the boiler biennially to demonstrate continuous compliance as specified in paragraphs (b)(1) through (7) of this section.

(1) As applicable, **inspect the burner**, and clean or replace any components of the burner as necessary (you may delay the burner inspection until the next scheduled unit shutdown, but you must inspect each burner at least once every 36 months).

(2) **Inspect the flame pattern**, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.

(3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.

(4) **Optimize total emissions of carbon monoxide**. This optimization should be consistent with the manufacturer's specifications, if available.



(5) **Measure the concentrations** in the effluent stream of **carbon monoxide** in parts per million, by volume, and **oxygen** in volume percent, **before and after the adjustments** are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made).

(6) Maintain onsite and submit, if requested by the Administrator, biennial report containing the information in paragraphs (b)(6)(i) through (iii) of this section.

- (i) The concentrations of CO in the effluent stream in parts per million, by volume, and oxygen in volume percent, measured before and after the tune-up of the boiler.
- (ii) A description of any corrective actions taken as a part of the tune-up of the boiler.
- (iii) The type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler.

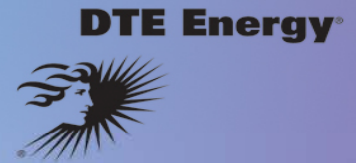
(7) If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of startup



## Energy Assessments

- **Same definition for both major and area sources**
- ***Energy Use System*** includes:
  - Process heating
  - Compressed air systems
  - Machine drive (motors, pumps, fans)
  - Process cooling
  - Facility heating, ventilation, and air conditioning systems
  - Hot heater systems
  - Building envelope
  - Lighting

# Energy Assessment Scope



## Facility-wide energy use <0.3 Tbtu/yr

- Corresponds to <34 MMBtu/hr at 8760 hrs/yr.
- One-day maximum.
- At least 50% of the energy output must be evaluated to identify energy savings opportunities.
- Boiler System and Energy Use System.

## Facility-wide energy use >0.3 and < 1.0 Tbtu/yr

- Corresponds to >34 and <114 MMBtu/hr at 8760 hrs/yr.
- Three -day maximum.
- At least 33% of the energy output must be evaluated to identify energy savings opportunities.
- Boiler System and Energy Use System.

## Facility-wide energy use > 1.0 Tbtu/yr

- Corresponds to >114 MMBtu/hr at 8760 hrs/yr.
- At least 20% of the energy output must be evaluated to identify energy savings opportunities.
- Boiler System and Energy Use System.



## Energy Assessments – one time

- Visual inspection of the boiler system
- Evaluation of operating characteristics of the facility, specifications for energy using systems, O&M and unusual operating constraints
- Inventory of major systems consuming energy from the boiler(s)
- List of energy conservation measures
- List of energy savings potential of energy conservation measures identified
- Comprehensive report detailing ways to improve efficiency, cost of specific improvements, benefits and time frames



## Notification requirements?

- Initial notification due September 17, 2011
- Tune-up required by March 21, 2012
- Notification on tune-up compliance status due July 19, 2012
- Energy assessment and compliance with emissions limits (if applicable) due March 21, 2014
- Notification on compliance status due July 19, 2014



## What records are required?

- Record the types and amount of fuel used each month.
- Record that you conducted startups and shutdowns according to the manufacturer's recommended procedures.
- Maintain records of all required notifications and reports, with supporting documentation.
- Maintain records that demonstrate compliance with emission limits, operating limits, tune-ups, and the energy assessment.



## What other reports are required?

- Prepare an annual Compliance Certification report for boilers with emission limits by March 1 of each year. (or use ROP schedule if ROP subject)
- Prepare and submit the annual Compliance Certification Report by March 15 if your boiler had any deviations from an emission limits or operating parameter.
- Provide notification prior to switching subcategories or firing solid waste.
- Submit test results to EPA's Central Data Exchange using the Electronic Reporting Tool within 60 days of each performance test.



## I don't need an ROP!! Or do I?



- Changes in the regulation of GHG mean that you need to reevaluate your PTE with respect to GHG
- Applicability at 100,000 tons CO<sub>2</sub>e on July 1, 2012



# Start-up/Shutdown Malfunction Requirements

- New standards require start-up/shutdown/malfunction plans
- Work must be done to minimize emissions during start-up, shutdown or malfunction
- Standards require recordkeeping and reporting
- Some units will require parameter monitoring to ensure compliance
- Limited use exemptions?
- Reporting of non-conformance events will be required
- Existing boilers requiring extensive work to meet limits could become new boilers



## Permitting issues

Rule 201. (1) Except as allowed in R 336.1202, R 336.1277 to R 336.1290, or R 336.2823(15) a person shall not install, construct, reconstruct, relocate, or modify any process or process equipment, including control equipment pertaining thereto, which may emit any of the following, unless a permit to install which authorizes such action is issued by the department:

- (a) Any air pollutant regulated by title I of the clean air act and its associated rules, including 40 C.F.R. §§51.165 and 51.166, adopted by reference in R 336.1299.
- (b) Any air contaminant.

- Significant work on a boiler – even if designed to allow compliance – could constitute reconstruction.
- Introducing new applicable requirements might be easiest through the ROP program.



## Permitting needs

The application and all supplemental information is being returned to you because based on the information submitted, it appears that the proposed equipment will be operated such that it is exempt from the permitting process under Michigan Air Pollution Control Rule R 336.1285(e). A copy of the Rule 285 is enclosed.

Please contact me if you have any questions regarding this determination.

- Permitting through the PTI Program may require modeling to show compliance with SO<sub>2</sub> and NO<sub>2</sub> one-hour standards.
- GHG BACT (or at least an evaluation of GHG emissions) may be required as part of permitting process.
- Permitting takes time.



## Permitting needs

- Thank you for your e-mail and letter of May 5, 2011. As you were informed on April 21st based upon the information Detroit Edison provided to us, it appears that the pollution control equipment in question will be operated such that it is exempt from the need for air use permits. As the AQD does not issue permits for exempt sources, we have already returned both sets of application submittals to you. We also request that you do not resubmit them a third time. If you have any questions concerning this e-mail and/or the situation in general, please feel free to contact me at [REDACTED].



## Solid waste definition changes



- EPA finalized changes to the definition of “solid waste” as codified at 40 CFR Part 241
- Boilers burning “solid waste” are incinerators and must comply with the commercial (CISWI) regulations
- Boilers that discontinue burning solid waste at least six months before the regulation go into effect need not comply with CISWI



## Traditional fuels

- Traditional fuels are materials that are produced as fuels and are unused products that have not been discarded and therefore are not solid waste (nor are secondary materials). These include the following:
- Fuels that have been historically managed as valuable fuel products rather than being managed as waste  
Examples:
  - Fossil Fuels: Coal, oil, and natural gas
  - Fossil Fuel Derivatives: Petroleum coke, bituminous coke, coal tar oil, refinery gas, synthetic fuel, heavy recycle, asphalts, blast furnace gas, recovered gaseous butane, coke oven gas, and virgin wood
  - Cellulosic biomass: Virgin Wood
- Alternative fuels developed from virgin materials that can now be used as fuel products
  - Used oil which meets specifications outlined in 40 CFR 279.11
  - Currently mined coal refuse that previously had not been usable as coal
  - \*Clean cellulosic biomass

# Non-hazardous secondary materials used as fuel – but considered solid waste unless



- The material is used as a fuel that remains within the control of the generator (whether at the site of generation or another site the generator has control over) and it meets the legitimacy criteria;
- The following materials have not been discarded in the first instance and meets the legitimacy criteria when used as a fuel (by the generator or outside the control of the generator): scrap tires removed from vehicles and managed under established tire collection programs and resinated wood residuals;
- The material is used as an ingredient in a manufacturing process (whether by the generator or outside the control of the generator) that meets the legitimacy criteria;
- The material has been sufficiently processed to produce a fuel or ingredient product that meets the legitimacy criteria; or
- The material that has been determined through a case-by-case petition process to not have been discarded and to be indistinguishable in all relevant aspects from a fuel product.



## Designation as “not a solid waste”

New rules establish a case-by-case process that provides persons an administrative process for receiving a formal determination from EPA .

Any petition submitted to EPA requesting a non-waste determination would need to demonstrate that the material has not been discarded in the first instance, satisfies the legitimacy criteria for fuels, and satisfies the following criteria:

- 1) Whether market participants treat the material as a fuel rather than a solid waste;
- (2) whether the chemical and physical identity of the material is comparable to commercial fuels;
- (3) whether the material will be used in a reasonable time frame given the state of the market;
- 4) whether the constituents in the material are released to the air, water or land from the point of generation to the point just prior to combustion of the material are released at levels that are comparable to what would otherwise be released from traditional fuels;
- and (5) other relevant factors.



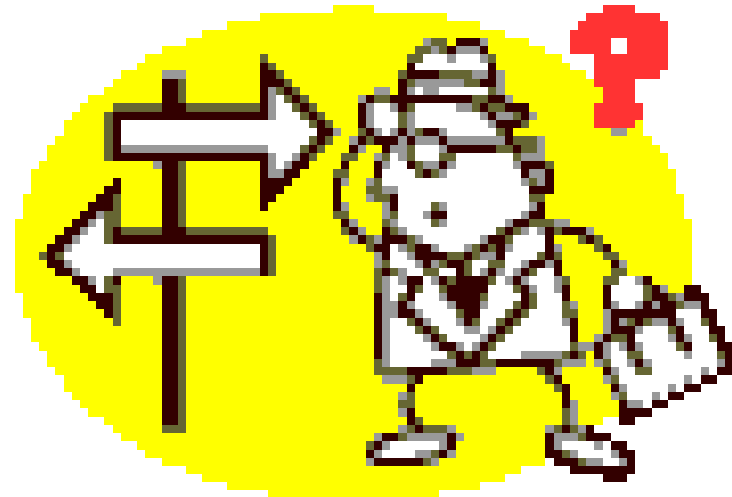
## What should I do now?

- The CISWI regulations are on hold, though the solid waste definition is in place.
- Sources burning materials that could be considered waste should review options:
  - Gathering information and petitioning US EPA for a determination.
  - Burning the material only until the CISWI regulations go into effect.
  - Complying with the CISWI.
  - Biofuels and other fuels could be considered waste – and should be reviewed carefully.



## Major Source IB MACT Requirements

- Small boilers – tune-ups required every other year.
- Limited use boilers – operate less than 10% of the time and are subject to tune-ups every other year.





## Major Source IB MACT



- What next?
- Know equipment and its required operating schedule.
- Can the equipment be considered limited use?
- Acquire “comfort letters” for alternative fuels.



## Standards for Oil-fired Boilers

### New Boilers

- PM limit 0.0013 lb/mmbtu (stack test)
- HCl limit 0.00033 lb/mmbtu (stack test)
- Hg limit  $2.1 \times 10^{-7}$  lb/mmbtu (stack test)
- CO limit 3 ppm (stack test)
- D/F limit 0.002 ng/dscm (stack test)

Why not test? Approx. \$25,000



## Standards for Oil-fired Boilers

### Existing Boilers

- PM limit 0.0075 lb/mmbtu (stack test)
- HCl limit 0.00033 lb/mmbtu (stack test)
- Hg limit  $3.5 \times 10^{-7}$  lb/mmbtu (stack test)
- CO limit 10 ppm (stack test)
- D/F limit 4 ng/dscm (stack test)



## Standards for Coal-fired Boilers (pulverized coal)

### New Boilers

- PM limit 0.0011 lb/mmbtu (stack test)
- HCl limit 0.0022 lb/mmbtu (stack test)
- Hg limit  $3.5 \times 10^{-6}$  lb/mmbtu (stack test)
- CO limit 12 ppm (stack test)
- D/F limit 0.003 ng/dscm (stack test)



## Standards for Coal-fired Boilers (pulverized coal)

### Existing Boilers

- PM limit 0.035 lb/mmbtu (stack test)
- HCl limit 0.033 lb/mmbtu (stack test)
- Hg limit  $4.6 \times 10^{-6}$  lb/mmbtu (stack test)
- CO limit 160 ppm (stack test)
- D/F limit 0.004 ng/dscm (stack test)



## Monitoring?

- Control equipment operating parameters must be monitored – and ranges established during stack test must be maintained (usually using a 12-hour average).
- PM CEMS is “required” for coal-fired and residual oil-fired units with a heat input greater than 250 mmbtu/hr.
- In cases where PM CEMS is used, it has been suggested that operating ranges need not be maintained/recorded for PM control equipment.
- Oxygen monitoring must be performed to ensure CO emissions compliance.
- Fuel types and mixtures must be maintained (as identified for stack test).



## PM CEMS? Really?

- PM CEMS have been used with some success by utilities in other states – though not often for compliance
- PM CEMS must be calibrated – and at low PM levels, this can be tough
- EPRI has been working on better ways to calibrate
- Installing one early – and getting experience – may be a good way to get ready for the new standard



## Important “Problems”

- Revisions to the proposed monitoring requirements for carbon monoxide for major source boilers and for CISWI units.
- Revisions to the proposed dioxin emission limit and testing requirement for major source boilers.
- Establishing a full-load stack test requirement for carbon monoxide coupled with continuous oxygen monitoring for major source boilers.
- Emission limits for solid-fuel boilers seem unrealistic for continued compliance?
- No “credit” for biofuels?
- Frankenboiler?



# Questions

