

CURRENT & UPCOMING EMISSION REGULATIONS

**Midwest Cogeneration Association
– October 22, 2009**

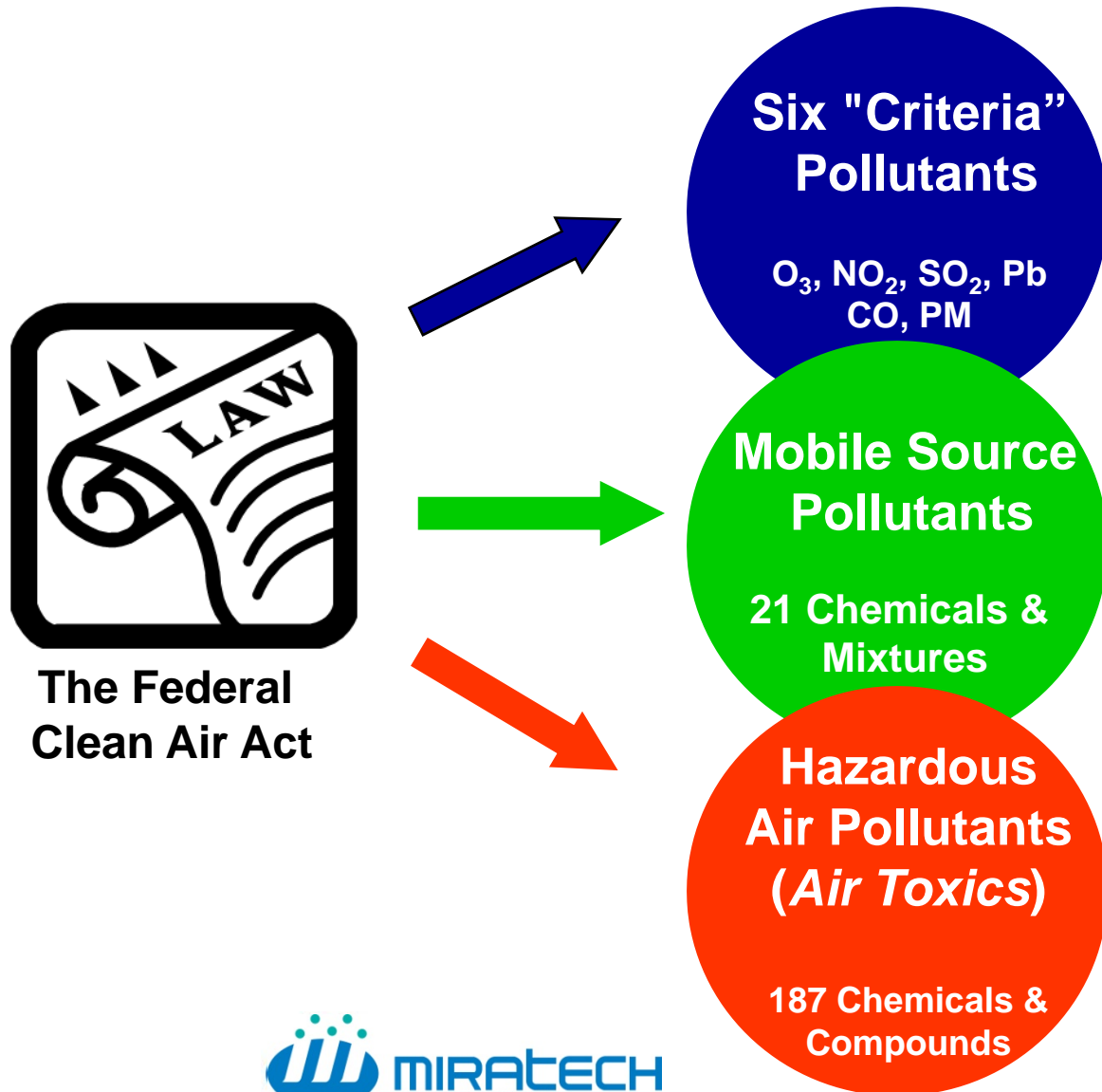
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▶▶ Agenda

- ▶▶ **Brief Review of Pollutants and Clean Air Act**
- ▶▶ **New Source Performance Standards for Compression Ignition Engines (the “Tier Standards”) – where we are what it means to you**
- ▶▶ **New Source Performance Standards for Spark Ignited Engines**

▶▶ Air Pollution & the Clean Air Act



▶▶ Important Rule Distinctions

▶▶ COMPLETELY DIFFERENT BUT RELATED RULES

▶▶ 40 CFR PART 60 SUBPART IIII

- New Source Performance Standards CI engines
 - Limits on NO_x, CO, PM and HC's
 - New and OEM based

▶▶ 40 CFR PART 60 SUBPART JJJJ

- New Source Performance Standards for SI Engines
 - Limits on NO_x, CO, and HC's
 - New and OEM based

▶▶ NSPS for Stationary Diesel Engines

▶▶ **Emission limits for new engines phased in since 1996**

- “Tiers” are increasingly stringent
- Most new engines are now at Tier 2 or 3 (depending on HP rating)
- Tier 4 begins phasing in 2011
- Compliance with Tier 1 – 3 has been with “in-cylinder” technologies (EGR, fuel injection, etc.)
- Tier 4 will probably require aftertreatment technologies, or a combination of technologies, (Selective Catalytic Reduction, Diesel Particulate Filters, Diesel Oxidation Catalyst)
- **Engines certified as “Emergency” are exempt from aftertreatment requirements of Tier 4**

▶▶ **Engine manufacturer (i.e., Cat, Cummins, DDC/MTU, etc.) certifies the engine meets the appropriate Tier**

- Owner/operator responsible for operating/maintaining the equipment according to manufacturer’s requirements to maintain emission compliance
- EPA establishes a minimum level of record keeping. State & Local government can require additional monitoring/record keeping

▶▶ NSPS for Stationary Diesel Engines

▶▶ Distinction between “non-emergency” and “emergency”

- Emergency engines are used during a loss of the normal power source
- Emergency engines are limited to 100 hours per year for maintenance and testing. No limit on operation during actual outage
 - Some state or local agencies will require fewer hours for maintenance and testing
- Emergency engines must be labeled as such at the factory
- Non-Emergency is anything that doesn't qualify as “Emergency”
- Demand response, storm avoidance, rental units, etc. would be classified as “Non-Emergency”.

▶ Summary of Gen-Set Limits

Engine Power (HP)	Tier	Year	CO	HC	NMHC+NOx	NOx	PM
Generator Sets							
750 - 1200 HP	Tier 2	2007	2.6	-	4.8		0.15
	Tier 4i	2011	2.6	0.3		2.6	0.075
	Tier 4f	2015	2.6	0.14		0.5	0.02
> 1201 HP	Tier 2	2007	2.6	-	4.8		0.15
	Tier 4i	2011	2.6	0.3		0.5	0.075
	Tier 4f	2015	2.6	0.14		0.5	0.02

Emissions are in g/hp-hr

▶▶ NSPS for SI Engines

▶▶ **Applies to spark ignited engines**

- Gasoline, natural gas, LPG, land-fill/digester gas
- All stationary engines > 25 hp

▶▶ **Emission limits for new engines, phased in starting 2007**

- Certification of engines by the manufacturer is voluntary, however many high-volume manufacturers have or will certify their small engines (~ 250 hp or smaller)
- Many large-horsepower manufacturers (Cat, Waukesha, Cummins, Jenbacher, etc) have lean-burn engines that are compliant without aftertreatment
- Smaller HP engines will use 3-way catalyst to meet compliance levels

▶▶ **Owner/operator is responsible to meet the emission limits**

- Perform an initial compliance test (NO_x, CO, HC test)
- Perform compliance test every 3 years or 8760 hours, whichever occurs first
- Maintain operation and maintenance records

▶ NSPS for SI Engines: The Table

Engine type and fuel	Maximum power (HP)	Manufacture date	Emission standards		
			NOX	CO g/HP-hr	VOC
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG.	100 - 499	7/1/2008	2	4	1
		1/1/2011	1	2	0.7
Non-Emergency SI Lean Burn Natural Gas and LPG.	500 - 1,350	1/1/2008	2	4	1
		7/1/2010	1	2	0.7
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG (except lean burn 500.HP<1,350).	> 500	7/1/2007	2	4	1
		7/1/2010	1	2	0.7
Landfill/Digester Gas (except lean burn 500 <= HP<1,350)	<500	7/1/2008	3	5	1
		1/1/2011	2	5	1
	> 500	7/1/2007	3	5	1
		7/1/2010	2	5	1
Landfill/Digester Gas lean burn	500 - 1,350	1/1/2008	3	5	1
		7/1/2010	2	5	1
Emergency	25 - 130	1/1/2009	10 (Nox + HC)	387	N/A
	> 130	1/1/2009	2	4	1

▶▶ Thanks for attending

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