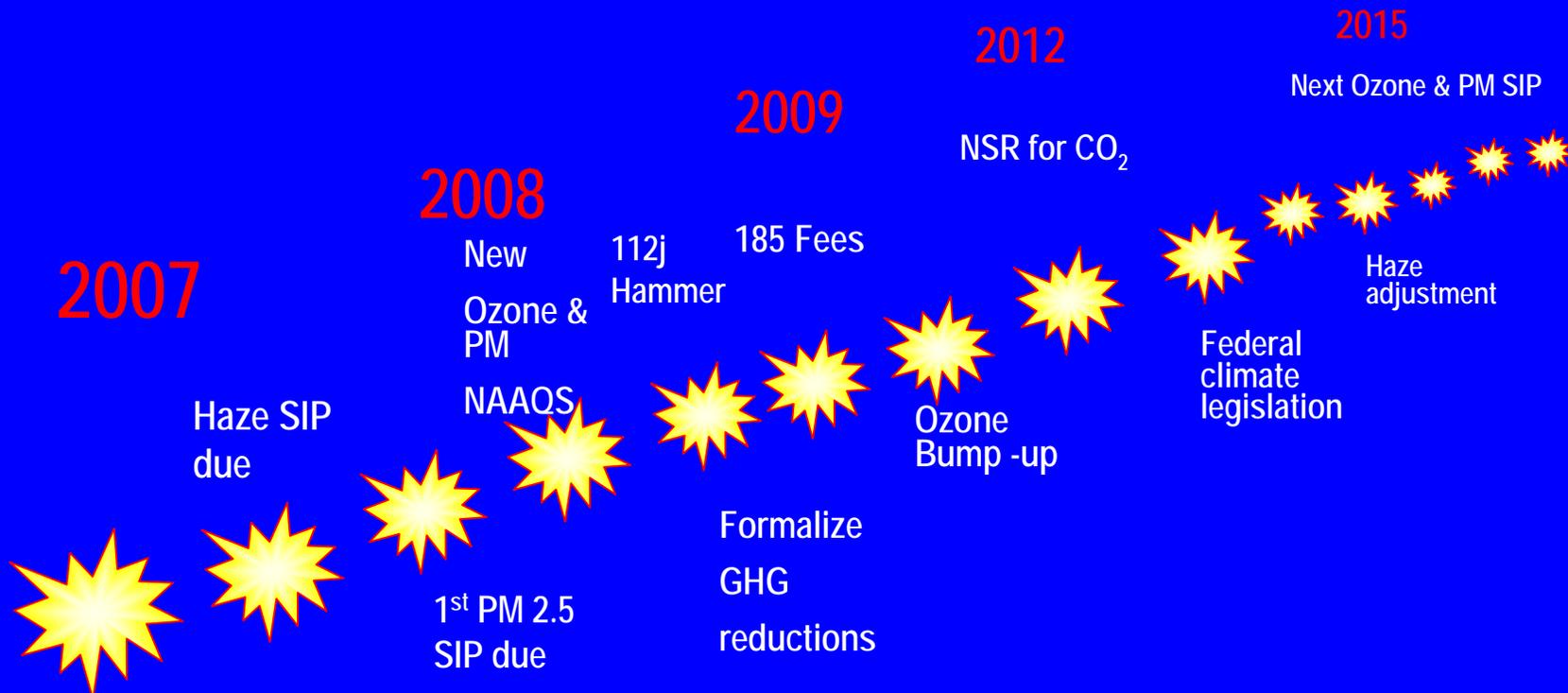


Fuel Burning Regulation Development

April 2008

SIPRAC

Attainment & GHG Obligations



★ **Multiple Goals**

★ **Multiple Pollutants**

★ **Multiple Challenges**

Air & Energy Issues - Convergence

- Highest electric demand days (HEDD), worst air quality tend to coincide
- Meeting the peaks results in using dirtiest and most expensive sources
- Industry, generators and markets need certainty from energy and environmental regulators
- Innovation will save energy and money, and drive environmental solutions

Fuel Burning Program Redesign

- Requires consideration of appropriate timing of the application of multi-pollutant requirements
 - Nitrogen Oxides – immediate and next phase
 - Mercury – next phase
 - Carbon Dioxide – through replacement & cap/trades
 - Sulfur- through replacement & fuel supply
- Lean Government – we cannot keep doing this the same old way

Internal Review

- Kaizen event held at DEP
- “Kaizen” combines two Japanese words that mean “to take apart” and “to make good”
- Helps to identify waste
- Conceptual framework for regulating fuel burning was advanced by the team

Boilers*
Starting with lb/hr

Exemptions:
none

Limits – Input and output - based

- Use RACT to inform achievable limits
- Include output based to improve efficiency
- Maybe less stringent for space heating

Alternatives - (not available for #6)

- Short duration averaging
- Averaging outside ozone season
- SEP-like contribution to residential furnace replacement program or CHP

*Grant and loan incentives

Electrical generation

Starting with lb/hr

Exemptions:

- Emer. engines
(real, not grid)
- RRFs

Limits –

- Output-based to improve EE
- Additional for load-following:
satisfy HEDD
& cover SO₂

Alternatives - (not available for #6)

- Short duration averaging
- SEP-like contribution to residential furnace
replacement program or CHP

BOILERS

immediate / next phase

EMISSION LIMITATIONS FOR BOILERS	Gas-fired	Residual-oil-fired	Distillate	Coal-fired	Wood
MRC of 25 but < 100 MMBtu/hr NOx in lb/MMBtu PM (lb/MMBtu) Sulfur (ppm)	0.05/ 0.05 .03 n/a	0.20/ 0.10 .03 3,000/ 1,500	0.08/ 0.08 .03 500/ 15	n/a	0.075/ 0.070 .037 n/a
MRC of 100 but ≤ 250 MMBtu/hr NOx in lb/MMBtu PM (lb/MMBtu) Sulfur (ppm)	0.10/ 0.10 .03 n/a	0.20/ 0.10 .03 3,000/ 1,500	0.20/ 0.10 .03 500/ 15	0.12/ 0.10 .051 2,000/ 1,800	0.075/ 0.070 .037 n/a
MRC of > 250 MMBtu/hr NOx in lb/MMBtu PM (lb/MMBtu) Sulfur (ppm)	0.12/ 0.08 .015 n/a	0.12/ 0.08 .015 3,000/ 1,500	0.12/ 0.08 .015 500/ 15	0.12/ 0.08 .015 2,000/ 1,800	0.075/ 0.070 .037 n/a

TURBINES

immediate / next phase

EMISSION LIMITATIONS FOR COMBUSTION TURBINES	GAS-FIRED	DISTILLATE
Combined cycle with a MRC of 25 MMBtu/hr or more NOx (ppmvd) PM (lb/MMBtu) Sulfur (ppm)	42/25 .02 n/a	65/42 .04 500/15
Simple cycle with a MRC of 25 MMBtu/hr or more NOx (ppmvd) PM (lb/MMBtu)) Sulfur (ppm)	55/25 .005 n/a	75/42 .027 500/15

RECIPROCATING ENGINES

immediate / next phase

EMISSION LIMITATIONS FOR RECIPROCATING ENGINES	GAS-FIRED	DISTILLATE
<p>≥200 HP, spark ignited rich or lean burn</p> <p>NO_x (gm/bk hp-hr)</p> <p>NO_x GPER</p> <p>PM GPER (gm/bk hp-hr)</p> <p>Sulfur (ppm)</p>	<p>1.5/1.5</p> <p>90% control or SCR</p> <p>.01</p> <p>n/a</p>	<p>n/a</p>
<p>≥200 HP, compression ignition</p> <p>NO_x (gm/bk hp-hr)</p> <p>NO_x GPER</p> <p>PM GPER</p> <p>PM (gm/bk hp-hr)</p> <p>Sulfur (ppm)</p>	<p>n/a</p>	<p>2.3/2.3</p> <p>90% control or SCR</p> <p>85% control or DPF</p> <p>.2/.01</p> <p>500/15</p>

Planning Meetings

- April 16th – Phoenix 9:00-11:00 AM
 - SIPRAC feedback on concepts and limitations
 - Output based emissions limitations discussion
- May 21st – Room TBD 9:00-11:00 AM
- June 18th – Phoenix 9:00-11:00 AM