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# **Environmental Benefits of Replacing “Old” Coal-Fired Power Plants with “New” Ones**

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**McIlvaine Hot Topic Hour – Ultrasupercritical Boilers**

**March 1, 2012**





# Background

- McIlvaine conducted a study to identify specific coal-fired boilers likely to be retired due to upcoming regulations
- The “Train Wreck” of regulations included:
  - Transport Rule (SO<sub>2</sub> and NO<sub>x</sub>)
  - Revisions to Ambient Air Quality Standards (PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, Ozone)
  - Cooling Water Intake Rule
  - Coal Combustions Residuals Rule
  - Utility MACT Rule (mercury, air toxics)
- Study of Potential Retirements conducted in anticipation of Utility MACT rule
  - Driven by concerns that numerous retirements would affect electricity supply and reliability

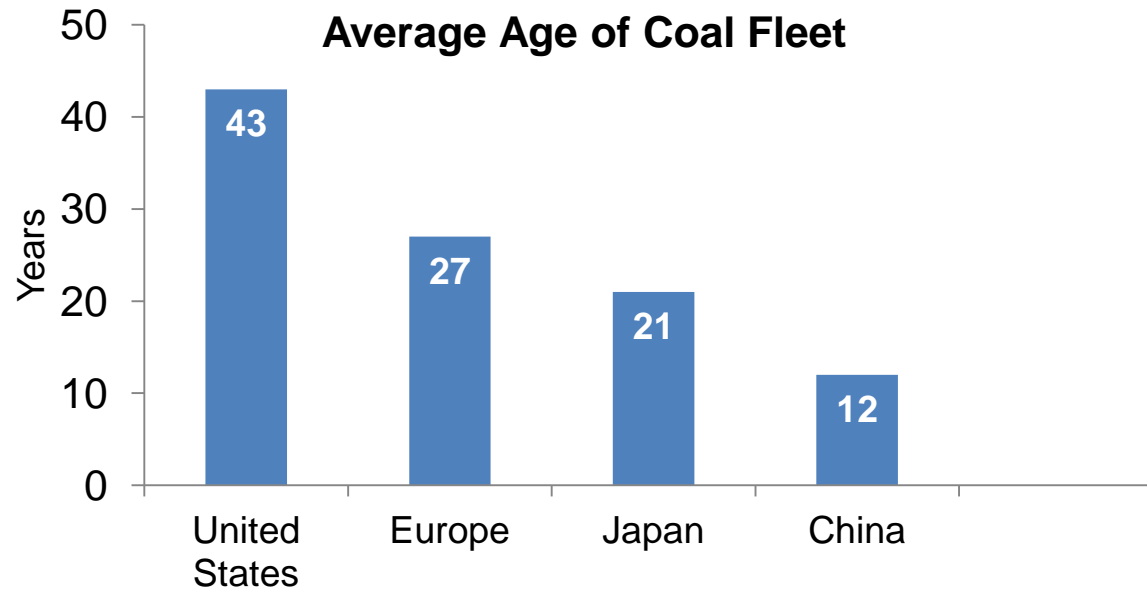
## Potential Coal-Fired Retirements

Scenario	Coal-Fired Boiler Retirements (MW)	Percent of Total Coal-Fired Capacity
Best Case	32,500	9.5%
Most Likely Case	67,500	19.7%



# Replace Rather Than Retire

- Follow-up study projected environmental benefits of replacing “older” coal-fired boilers with “new” ones
  - Compared actual emissions from older boilers
  - With typical emissions from new, more efficient, boilers
- Replacing boilers is an important issue given our aging coal fleet





# Comparison of Emissions

- Compared emissions of five “pollutants”: NO<sub>x</sub>, SO<sub>2</sub>, PM, Mercury and CO<sub>2</sub>
- Identified actual boilers to be retired based on size, age and pollution control equipment
- Determined actual emissions from those boilers based on data reported to EPA and other information
- Developed profile of emissions from typical new Supercritical boiler

## NO<sub>x</sub> Example:

Coal Fleet Replacement Scenario	Units to be Replaced			Total Annual Heat Input (MMBtu x 10 <sup>6</sup> )	New Units		Reduction in NO <sub>x</sub> Emissions	
	Primary Type of Coal	No. of Units	Annual NO <sub>x</sub> Emissions (Tons/Year)		NO <sub>x</sub> Emission Rate lb/MMBtu	Annual NO <sub>x</sub> Emissions (Tons/Year)	Tons/Year	Percentage
<b>10% Replaced</b>	Bituminous	172	194,840	1,018	0.07	35,630	159,210	81.7%
	Subbituminous	57	63,865	431	0.07	15,085	48,780	76.4%
	Lignite	1	870	5	0.08	200	670	77.0%
	<b>TOTAL</b>	<b>230</b>	<b>259,575</b>			<b>50,915</b>	<b>208,660</b>	<b>80.4%</b>



# Environmental Benefits

Replacing Old Coal Based Units with New Units  
Summary of Environmental Benefits

