Costs of Retrofitting vs. Replacing Coal-Fired Power Plants

to Comply with New Air Pollution Control Rules

McIlvaine Hot Topic **July 28, 2011**

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Overview

Existing Coal Fleet

- 1,032 Units
- 332 GW

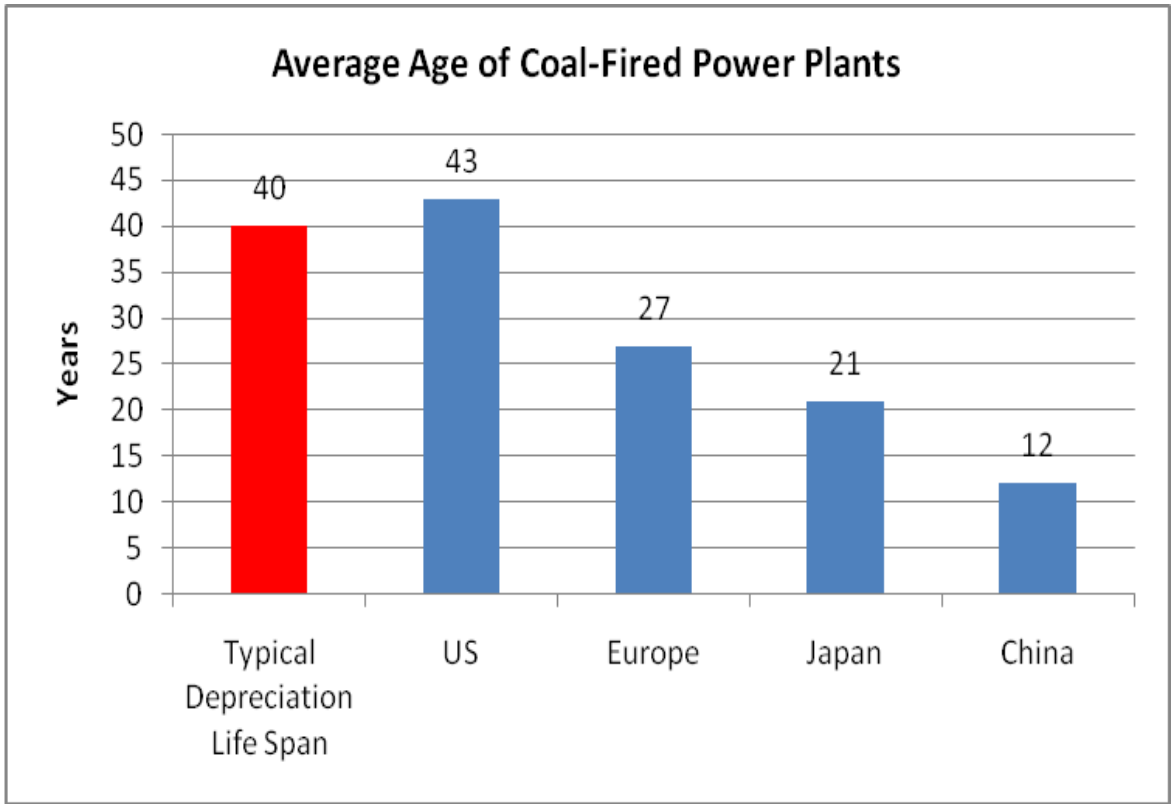
Retirements Due to Upcoming Air Rules

- 30 GW to 100 GW Projected
- McIlvaine Projections:
  - Best Case: 294 Units/32.5 GW
  - Worst Case: 564 Units/101.0 GW
- How will lost capacity be replaced?

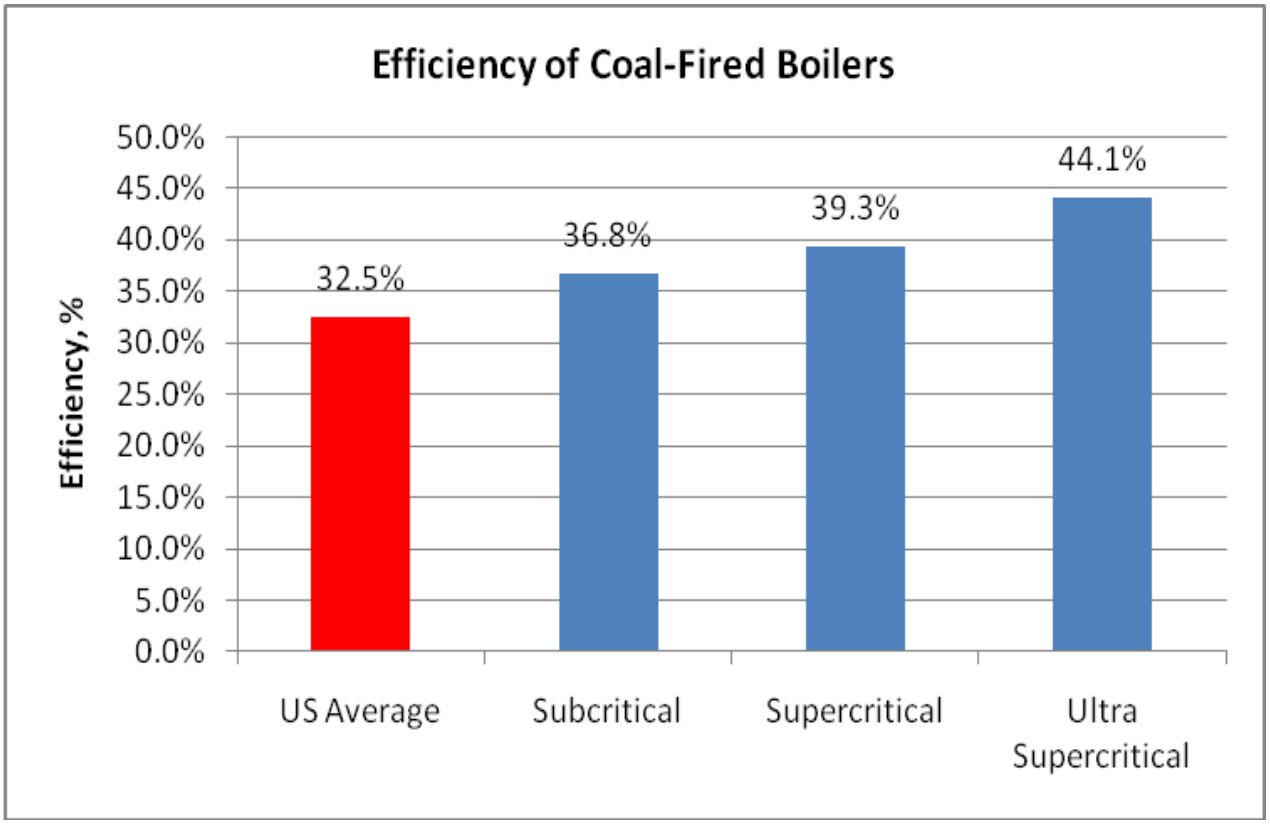
Study to Determine Costs and Environmental Benefits

- Replacing Existing Units with New Ultra-supercritical rather than Retiring or Retrofitting
- Three Scenarios: 10%, 20%, 30% Replaced with USC
- Similar to Retirement Projections: 33 GW, 67 GW, 100 GW

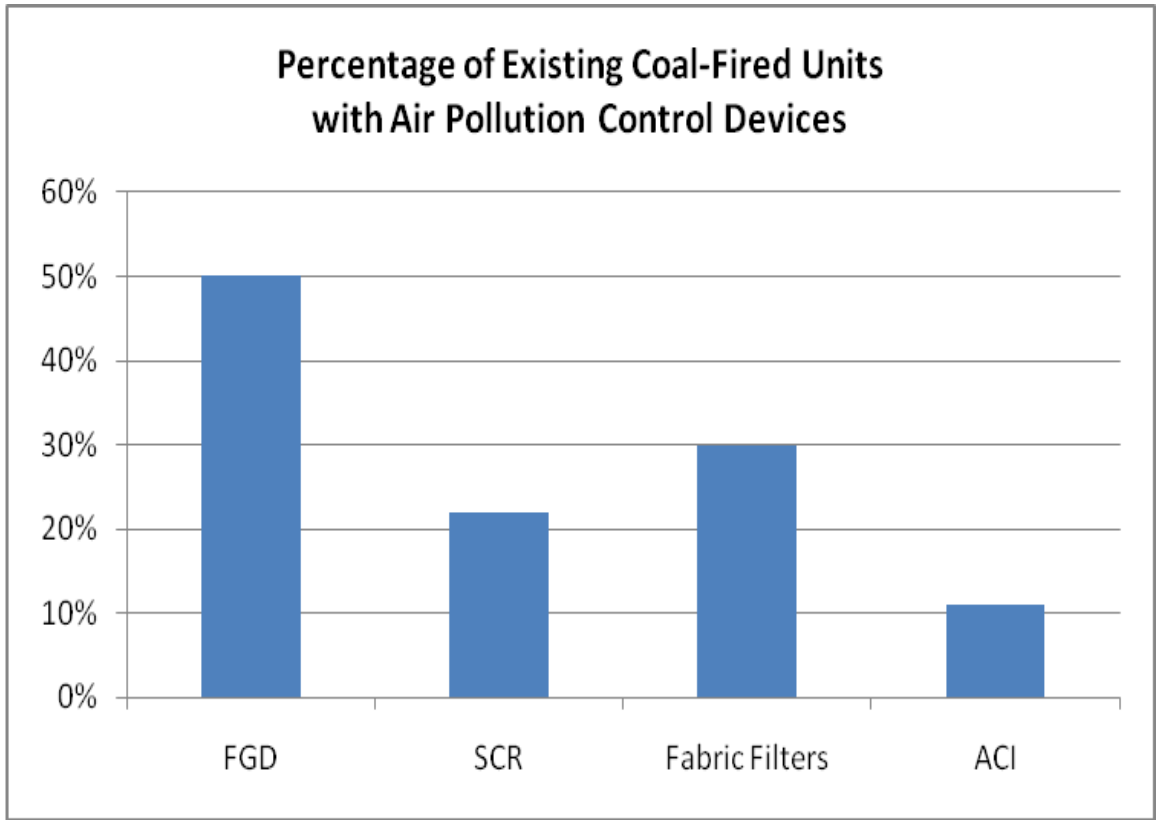
Aging Coal Plants



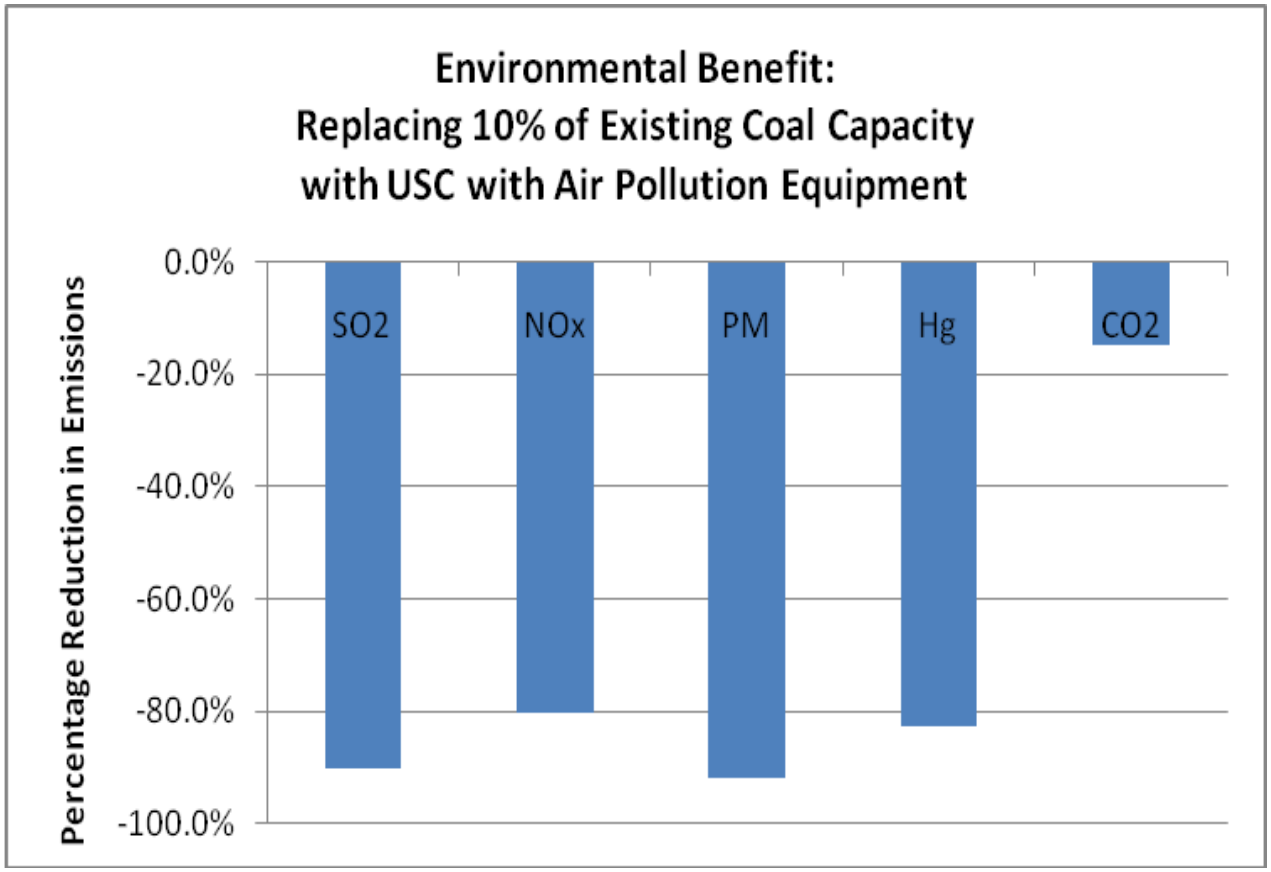
Inefficient Coal Plants



Out of Date Coal Plants



Benefits of Replacing Old Units



Replacement Scenarios

Coal Fleet Replacement Scenarios	Units Replaced		Percentage of Total Capacity
	No of Units	Capacity (MW)	
10% Replaced	286	30,900	9.0%
20% Replaced	493	68,200	19.9%
30% Replaced	564	101,000	30.4%

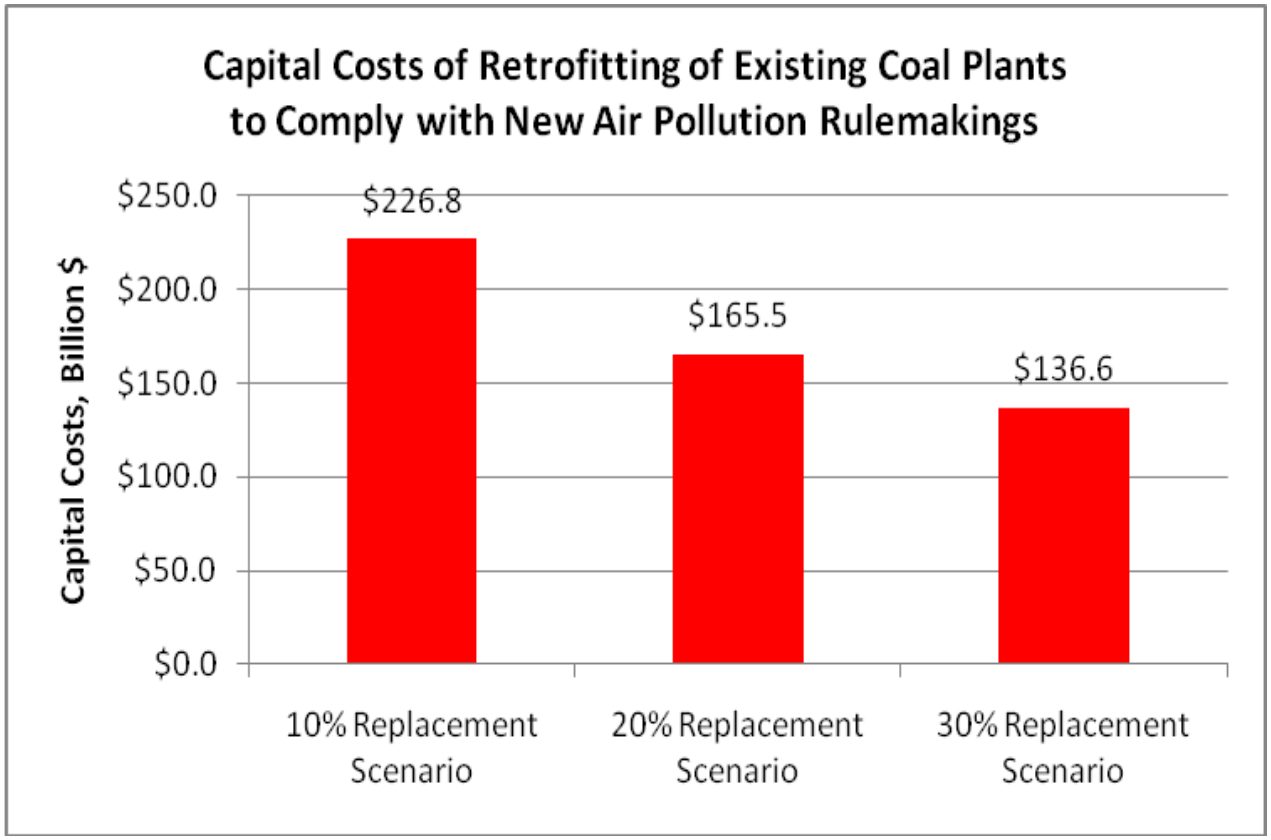
Based on:

- Size of Unit (MW)
- Age of unit
- Whether the unit has FGD and, if so, age of scrubber
- Whether the unit has SCR

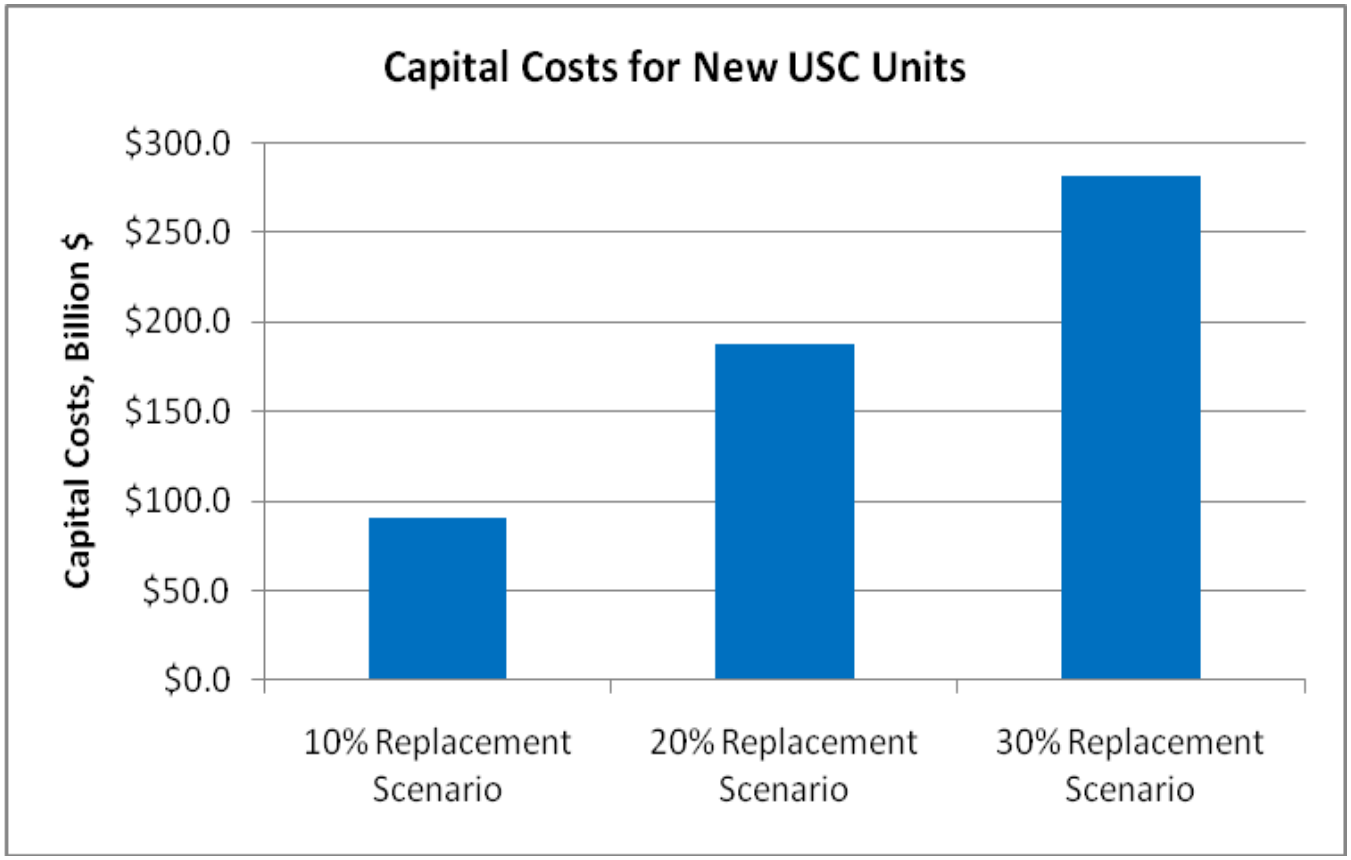
Air Pollution Control Component Costs

Control Device	Cost $/kW
Wet FGD	$200-500
In-furnace NOx	$35-50
Post-combustion NOx	$100-400
Fabric Filters	$75-500
Activated Carbon Injection	$10-30

Cost of Retrofitting Existing Units



Cost of New Coal Units



Cost of Replacing Old Coal Plants with New Ones