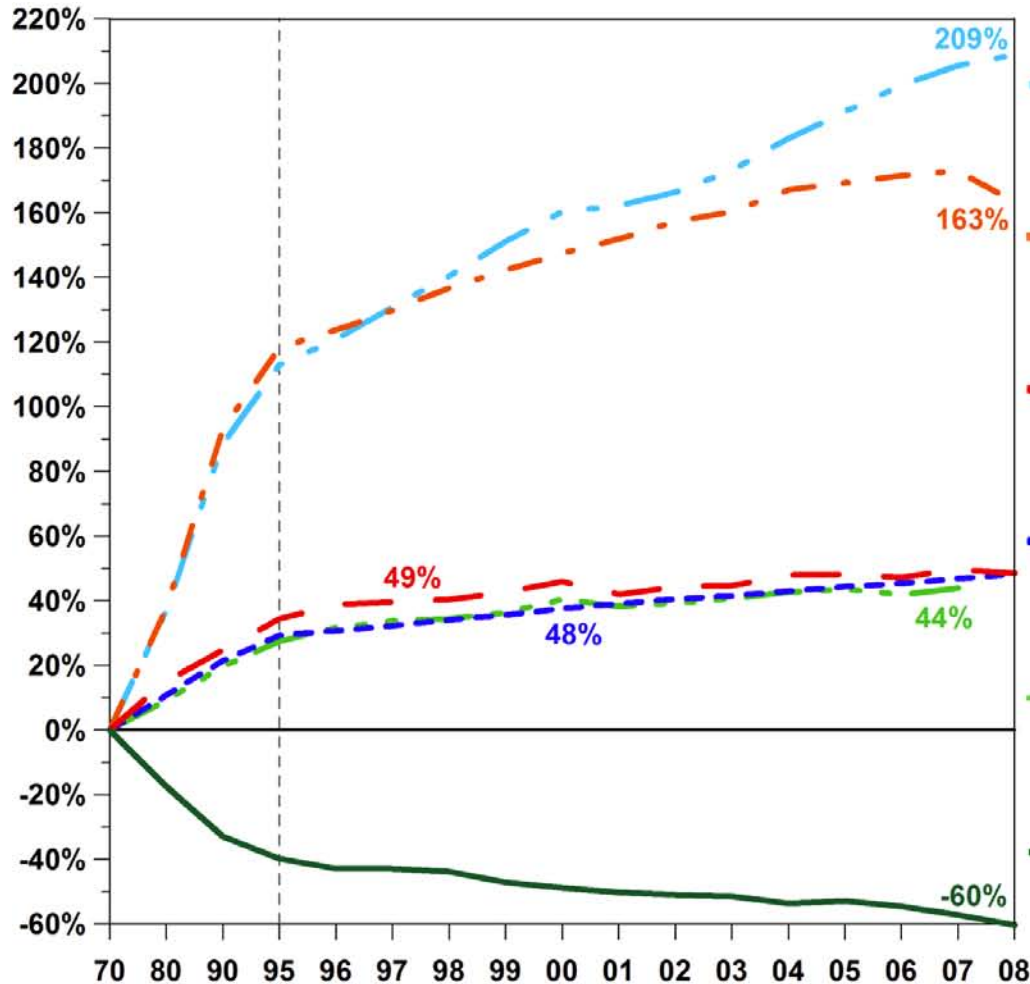


# Reducing Pollution from Power Plants

**Gina McCarthy**  
**Assistant Administrator**  
**US EPA Office of Air and Radiation**  
**October 29, 2010**

# GDP Up; Pollution Down



Gross Domestic Product



Vehicle Miles Traveled



Energy Consumption



Population



CO<sub>2</sub> Emissions



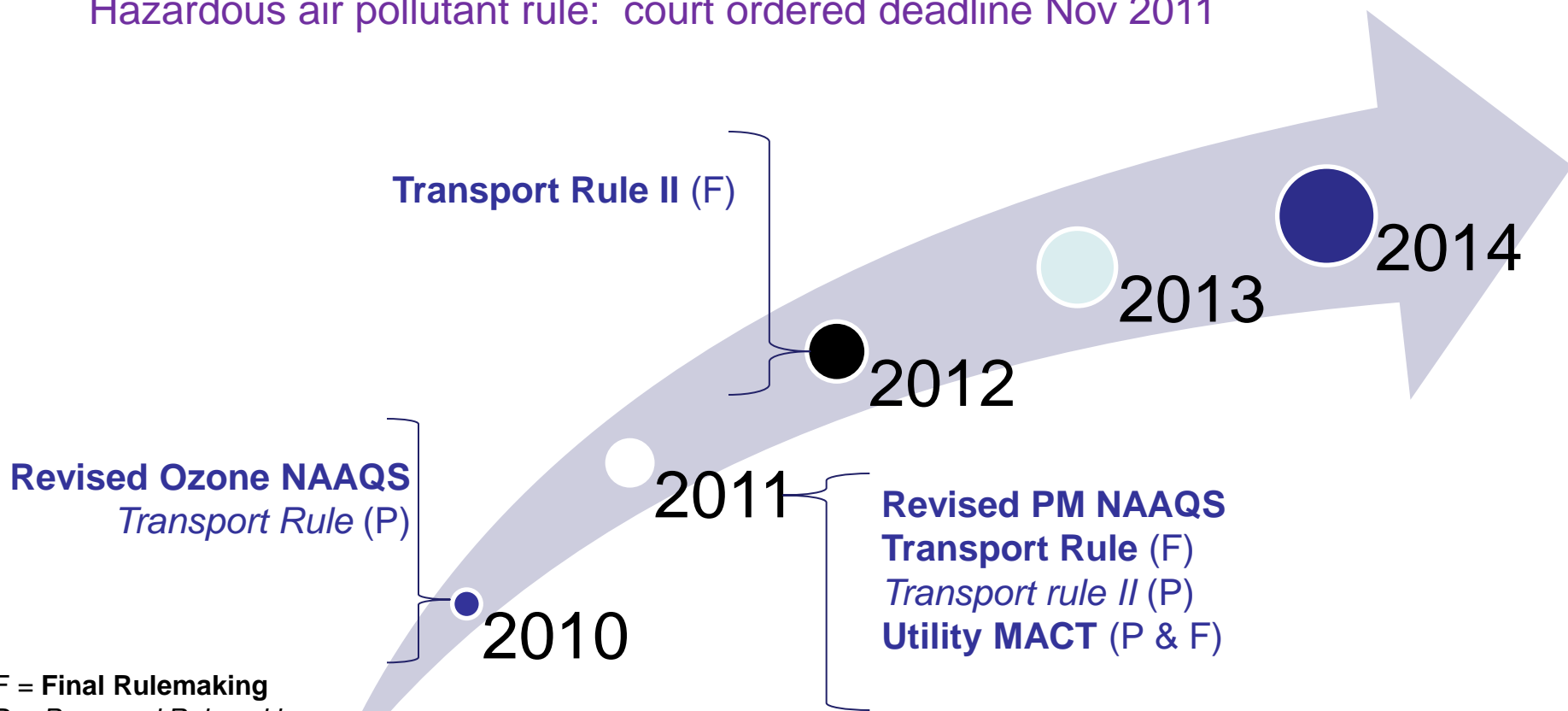
Aggregate Emissions  
(Six Common Pollutants)

# Key Power Plant Rules Overdue

- The American public has suffered avoidable deaths and illnesses as important Clean Air Act-required power plant controls have been delayed more than a decade.
- The Act required states by 2000 to adopt rules as needed to control interstate pollution to help meet health-based air quality standards issued in 1997
  - NOX SIP Call Rule (1998) partially addressed ozone transport by 2004, but did not address fine particles.
  - Previous administration finalized Clean Air Interstate Rule (CAIR) in 2005 but court found legal flaws and ordered EPA to replace it. CAIR remains in place in the interim.
  - New Transport Rule to replace CAIR and address 2006 PM NAAQS is to be completed in June 2011.
- The Act required studies in the early 1990s and, if appropriate and necessary, control of hazardous air pollutants from power plants.
  - Positive determination in 2000 meant final rule due by 2002.
  - Previous Administration issued Clean Air Mercury Rule for power plants in 2005 but court found rule legally flawed and vacated it. Also, rule failed to address all air toxics.
  - Consent decree requires EPA to propose rule to control toxic air pollutants from EGUs by March 2011 and finalize by November 2011.

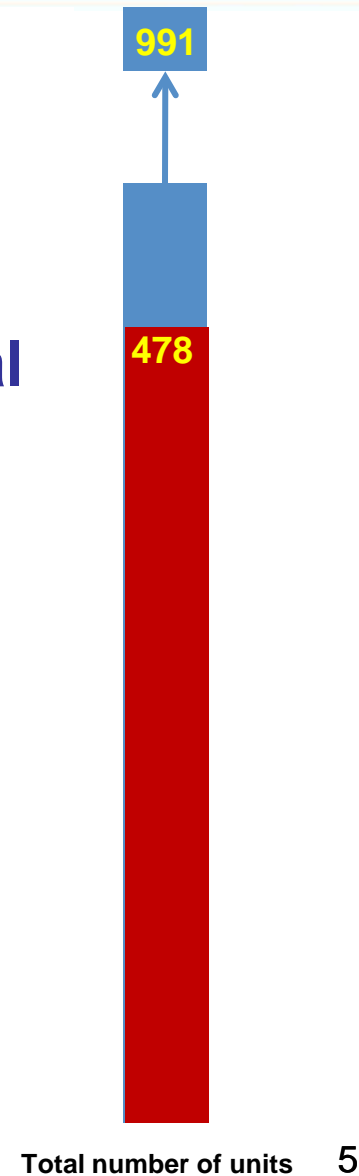
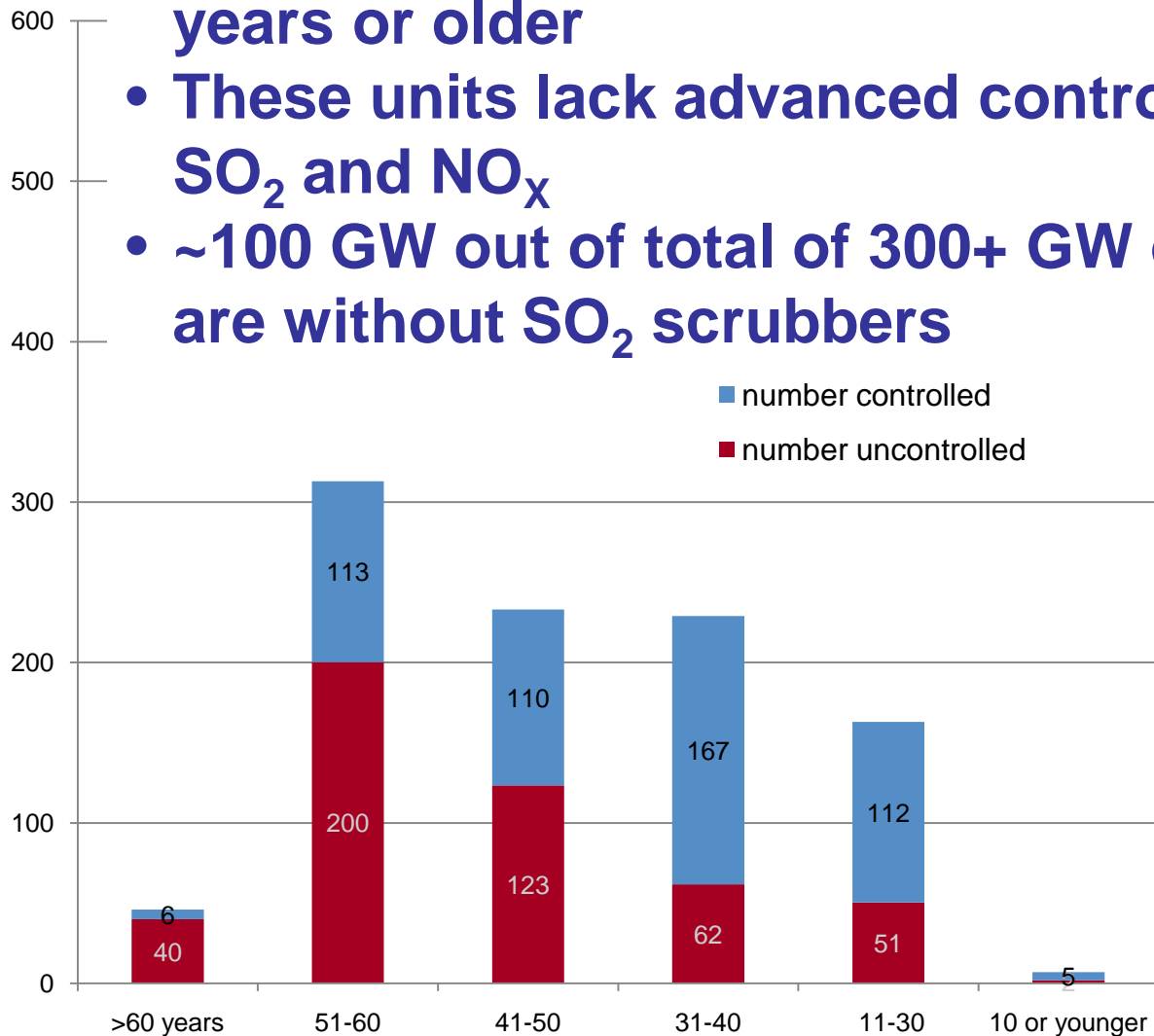
# Rulemaking Schedule

Criteria air pollutant rules: driven by statutory and judicial deadlines  
Hazardous air pollutant rule: court ordered deadline Nov 2011



F = Final Rulemaking  
P = Proposed Rulemaking  
NAAQS = National Ambient Air Quality Standard  
PM = particulate matter  
MACT = Maximum Achievable Control Technology

- 60% of the uncontrolled units are 31 years or older
- These units lack advanced controls for SO<sub>2</sub> and NO<sub>x</sub>
- ~100 GW out of total of 300+ GW of coal are without SO<sub>2</sub> scrubbers



# Health Benefits for Millions of Americans

## Benefits Greatly Exceed Costs

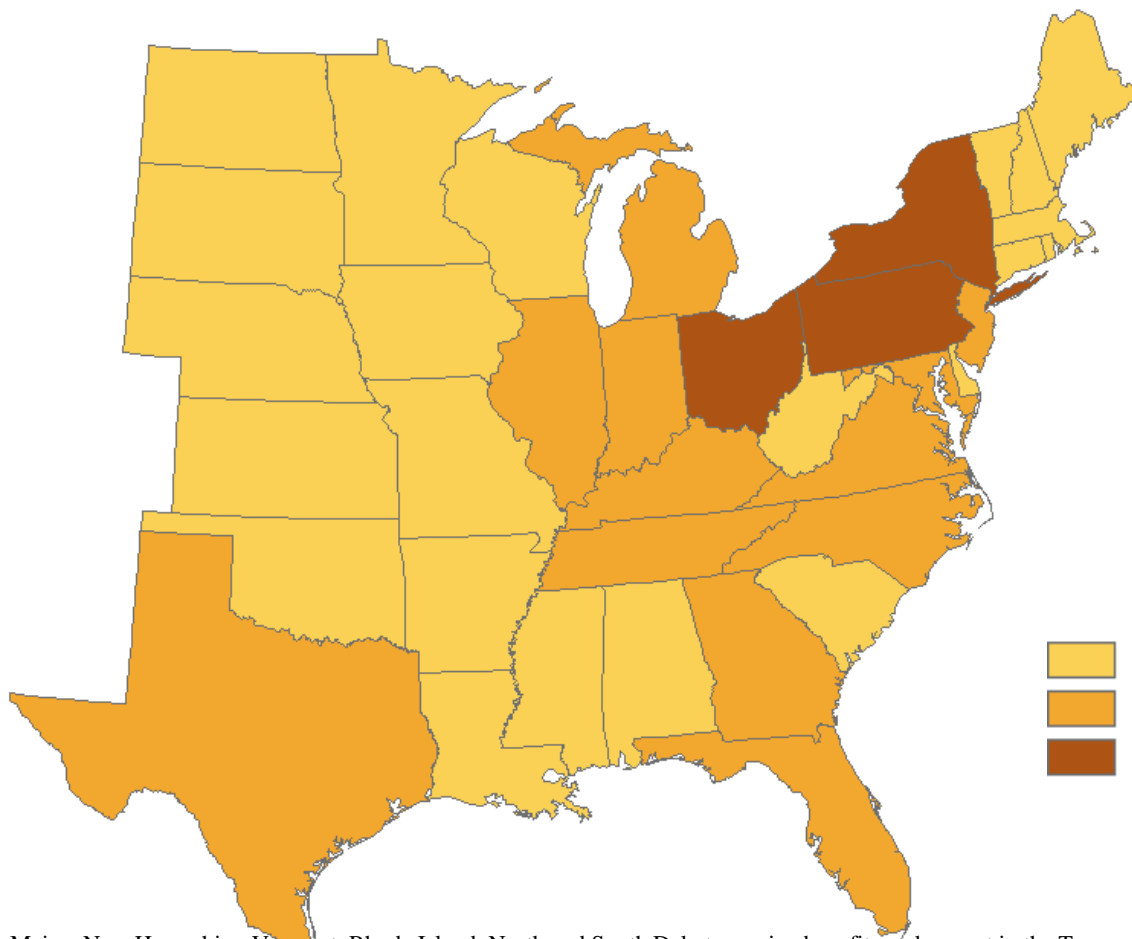
- EPA estimates the annual benefits from the proposed transport rule range between \$120-\$290 B (2006 \$) in 2014 with annual compliance costs at \$2.8 billion in 2014.
- EPA estimates 2014 prices for electricity, natural gas, and coal prices increase 1 to 2%.

Estimated Number of Adverse Health Effects Avoided Due to Implementing the Proposed Transport Rule\*

Health Effect	Number of Cases Avoided
Premature mortality	14,000 to 36,000
Non-fatal heart attacks	23,000
Hospital and emergency department visits	26,000
Acute bronchitis	21,000
Upper and lower respiratory symptoms	440,000
Aggravated asthma	240,000
Days when people miss work or school	1.9 million
Days when people must restrict activities	11 million

# Billions of Dollars of Health Benefits in 2014

## Proposed Transport Rule



### Ranges of Benefits

Mortality Avoided		Monetized Benefits (billion \$)	
Low	High	Low	High
0 to 400	0 to 1,000	0 to 4	0 to 10
400 to 800	1,000 to 2,000	4 to 7	10 to 15
800 to 1,400	2,000 to 3,600	7 to 12	15 to 29

Maine, New Hampshire, Vermont, Rhode Island, North and South Dakota receive benefits and are not in the Transport Rule region. Transport Rule RIA, Table A-4 and A-5; mortality impacts estimated using Laden et al. (2006), Levy et al. (2005), Pope et al. (2002) and Bell et al. (2004); monetized benefits discounted at 3%

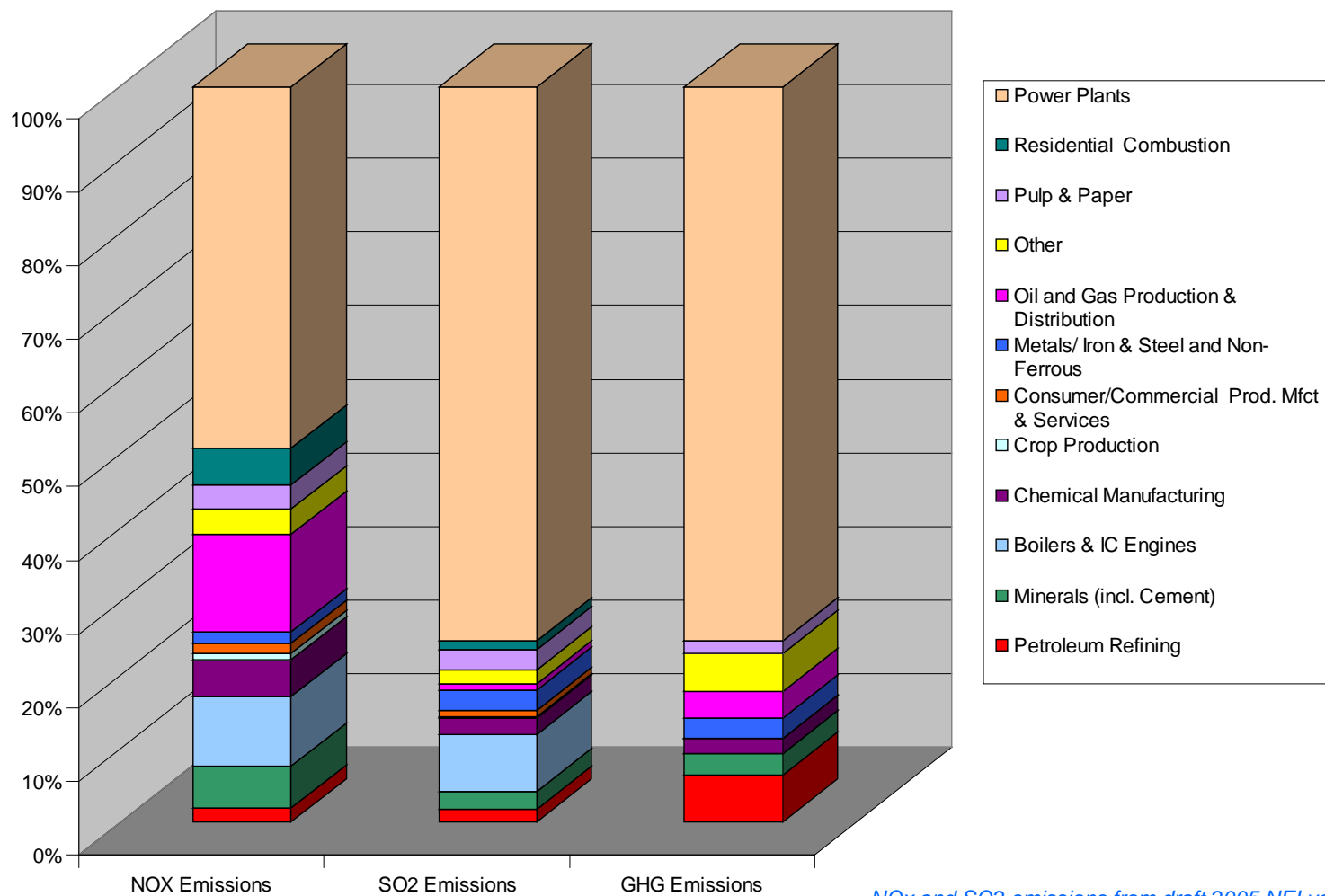
## Toolbox of Emissions Reduction Technologies for Power Plants Many Have Multi-pollutant Benefits

- Pollution reduction controls at utilities are well-understood and available now
- SO<sub>2</sub> reduction technologies
  - Reduce HAPs to meet requirements of upcoming Utility MACT
  - Help in-state areas attain the existing and upcoming PM<sub>2.5</sub> NAAQS and 2010 SO<sub>2</sub> NAAQS
  - Help downwind states attain PM<sub>2.5</sub> NAAQS
  - Address visibility (regional haze) improvement goals
- NO<sub>x</sub> reduction technologies
  - Help in-state areas attain the existing and new ozone NAAQS
  - Help downwind states attain the existing and new ozone NAAQS
  - Address visibility (regional haze) improvement goals
- Mercury reduction technologies
  - Reduce mercury emissions to meet requirements of upcoming Utility MACT
- Direct PM reduction technologies:
  - Help attain PM<sub>2.5</sub> NAAQS and visibility program requirements
  - Reduce HAP emissions to meet requirements of upcoming Utility MACT





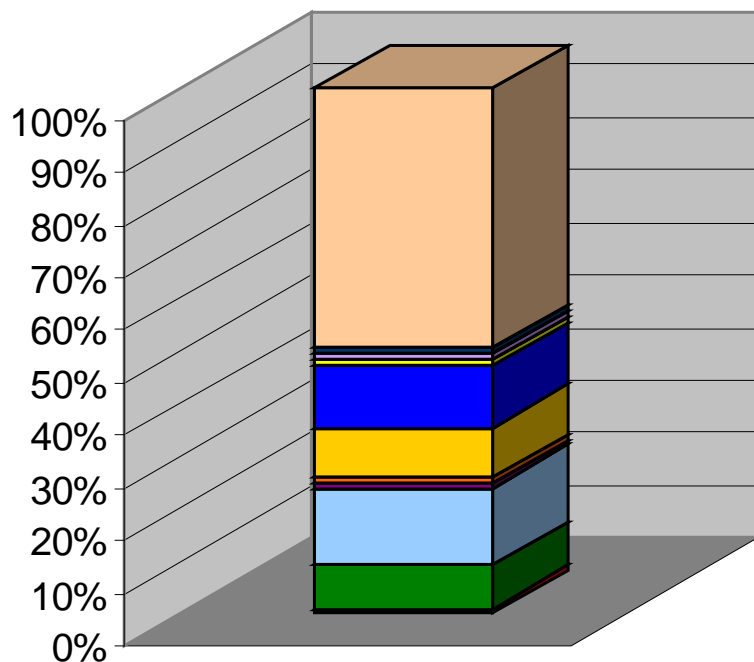
# Stationary Source Emissions of NO<sub>x</sub>, SO<sub>2</sub> and GHGs



† For GHG bar, boilers are within each industry sector.

*NO<sub>x</sub> and SO<sub>2</sub> emissions from draft 2005 NEI version 2  
GHG emissions from 2006 GHG inventory*

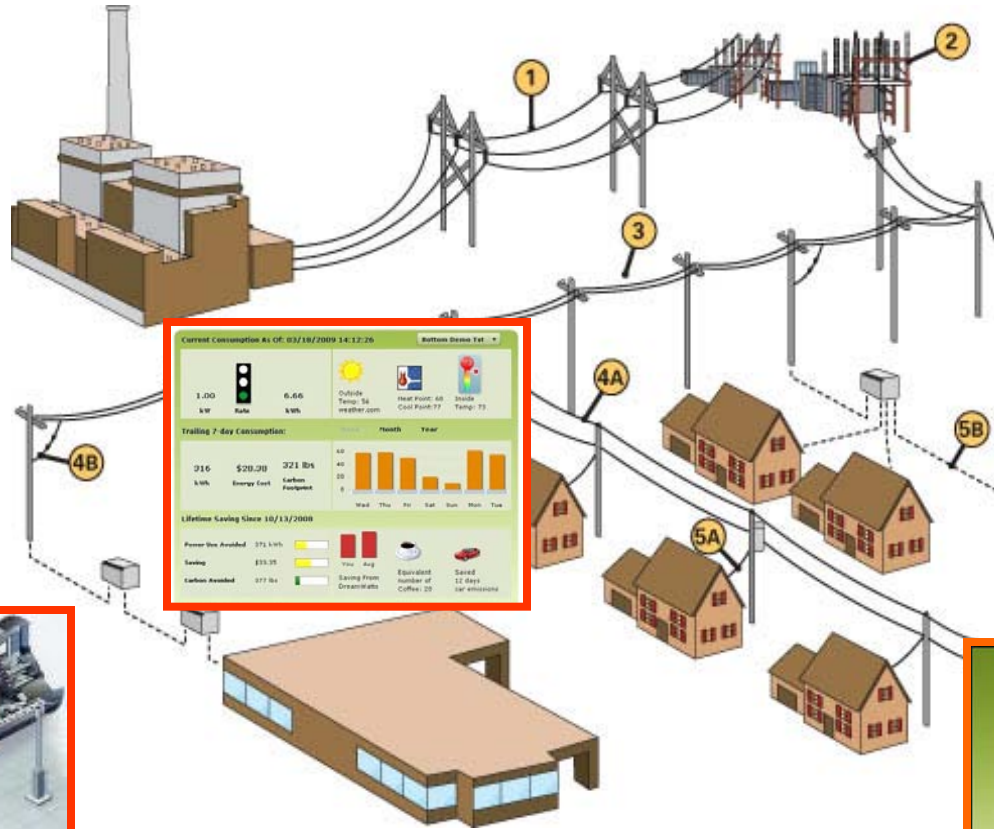
# Mercury Air Emissions Estimates for Stationary Sources (2005)



- Coal-fired Power Plants
- Residential Combustion
- Pulp and Paper
- Other
- Metals/Iron & Steel & Non-ferrous
- Waste Management
- Consumer/Commercial Prod. Manuf.
- Chemical Manufacturing
- Boilers and IC Engines
- Minerals (including Cement)
- Petroleum Refineries

# Next Generation Electric Grid

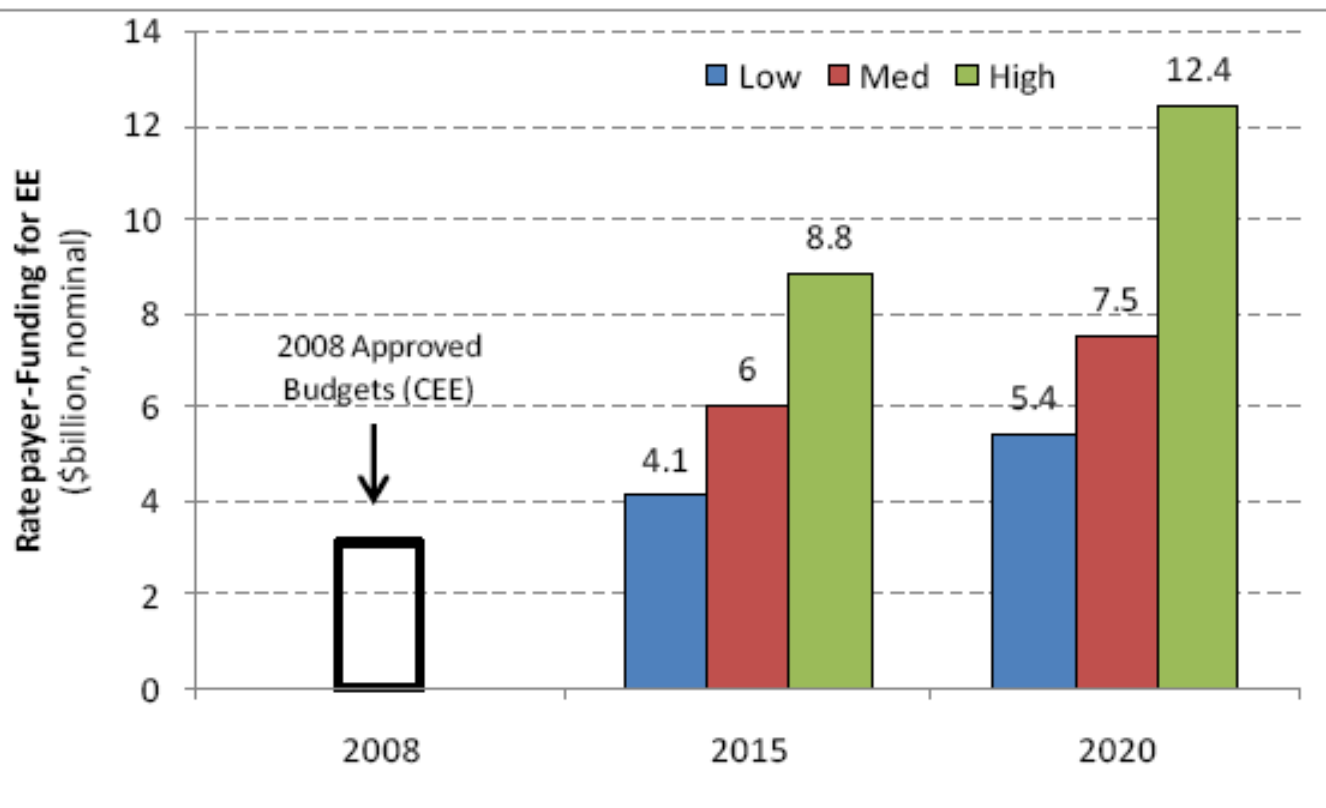
- ✓ Facilitates integration of variable renewables, demand response, energy efficiency, distributed generation and transport electrification
- ✓ Supports reliability, low costs, and clean generation



# The Role of Energy Efficiency and Demand Response

- Multiple benefits of supplementing our rules with actions to reduce electricity demand by improving energy efficiency would:
  - Substantially cut total costs to power sector of controlling conventional pollutants
  - Achieve reductions in CO<sub>2</sub> through idling or retirement of inefficient fossil-fuel-fired generating stations that would no longer be needed or economic
  - Avoid or defer need for new generation
  - Reduce conventional air pollutant emissions, especially on high electricity demand days (which coincide with poor air quality)
  - Reduce concerns about reliability of electricity supply
  - Lower consumer bills
- EPA encourages state regulators, including PUCs and State energy offices, system transmission operators, and power companies themselves to take action to reduce demand for electricity.

# Energy Efficiency Program Funding and Electricity Savings Projected to Grow Substantially

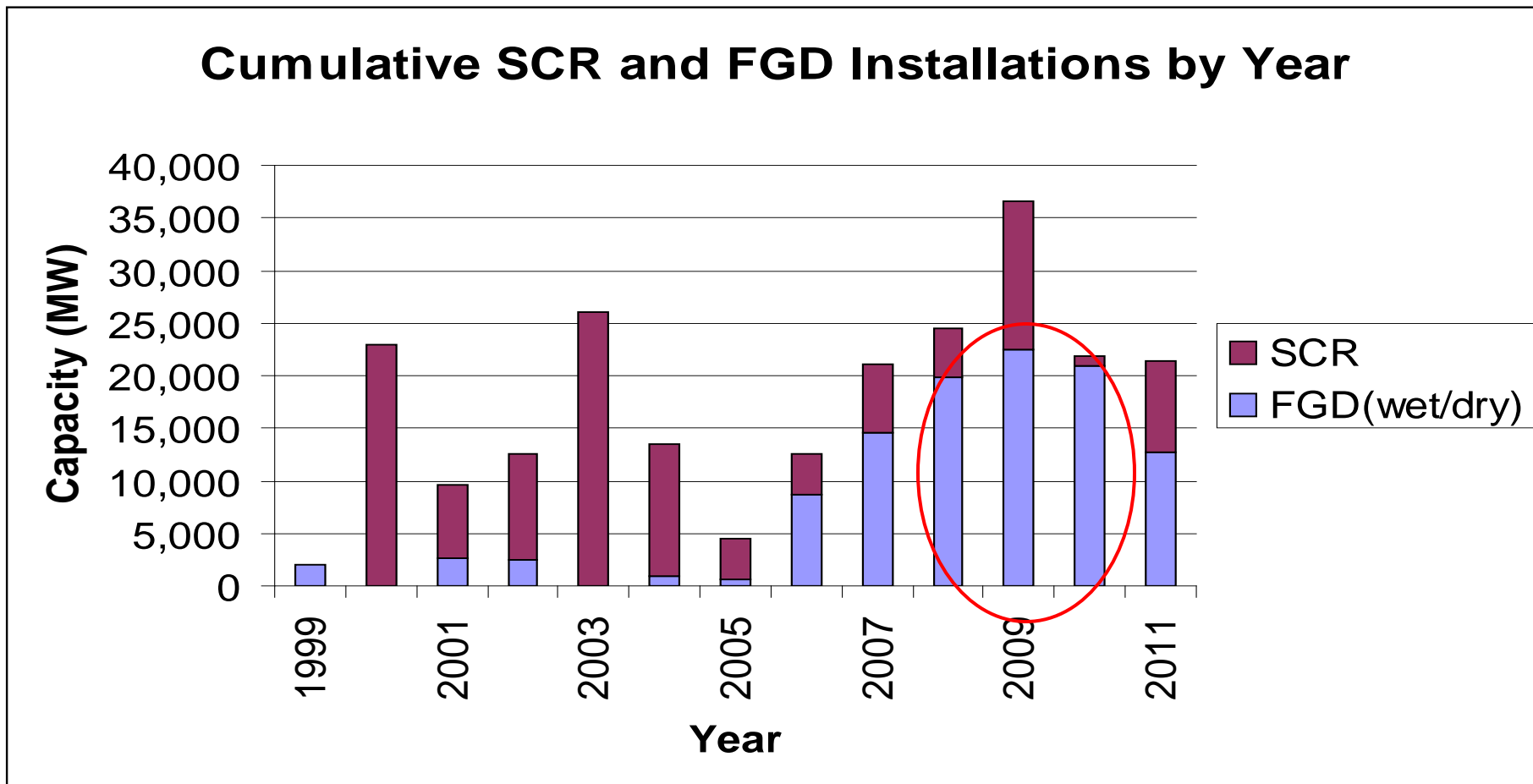


**LBNL forecasts a 250% to 400% increase (Med/High cases) in EE program funding by 2020**

**Cumulative savings by 2020 equal 6.1% (med) to 8.6% (high) of EIA's forecast 2020 electricity demand**

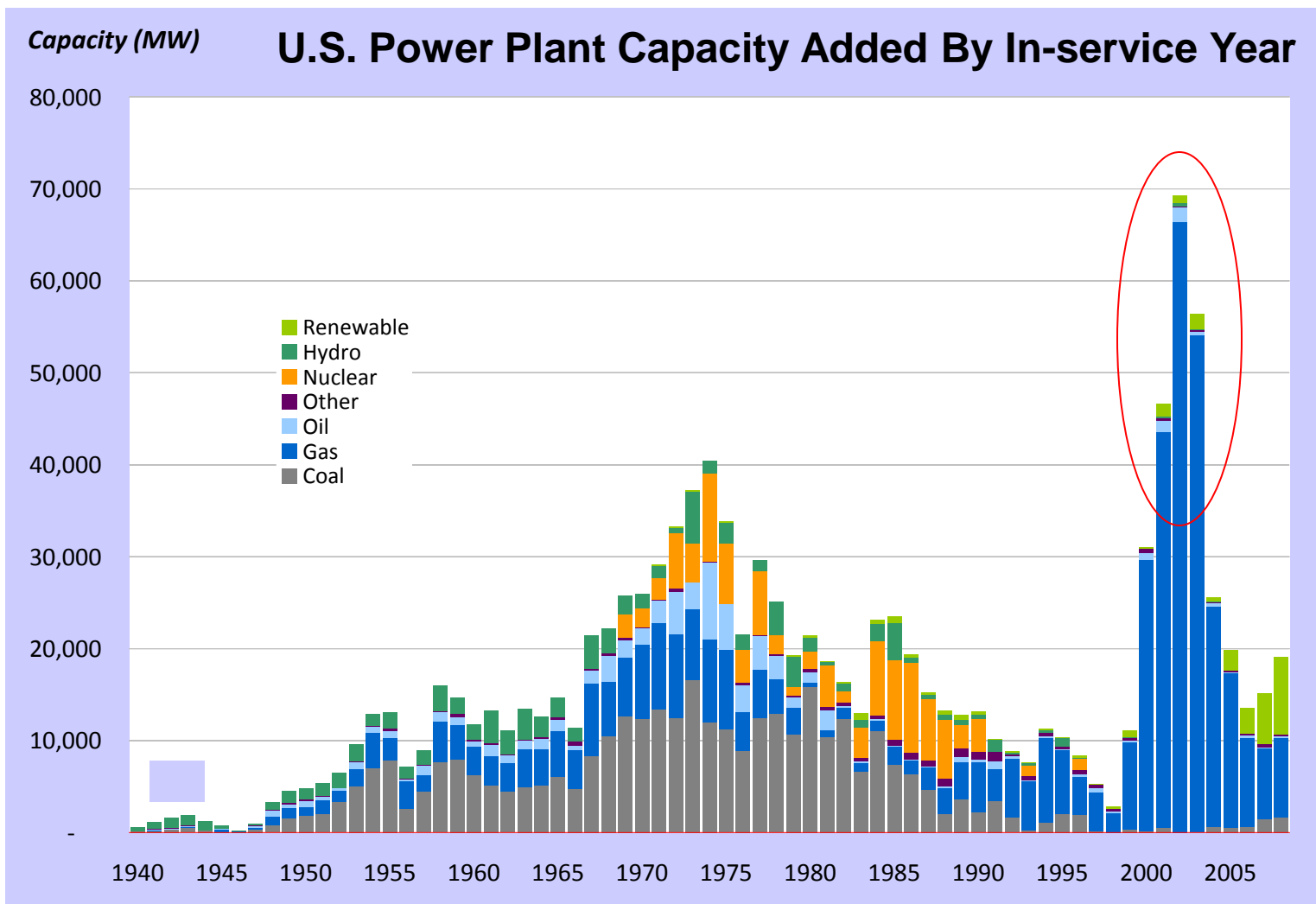
## Industry Capacity to Add New Emissions Controls

### Added 20+ GW of SO<sub>2</sub> scrubbers per year 2008 - 2010



# Industry Capacity to Add New Generation

Between 2001 and 2003 the electric industry built over 160 GW of new generation



# Administrator's Guiding Principles

- Promoting common-sense strategies that encourage investment in energy efficiency and updated technologies.
- Using similar strategies to capture multiple pollutants.
- Setting clear, achievable standards while maintaining maximum flexibility on how to get there,
- Seeking input from citizens, industry, affected entities, other stakeholders, as well as our partners in state, local and tribal governments.
- Setting the standards that make the most sense – focusing on getting the most meaningful results through the most cost-effective measures.