



Preferred Strategies and Approaches to Emissions Reductions

CEC & IJC
Conference

Presented by Ann G. Berwick,
M.J. Bradley & Associates, Inc.



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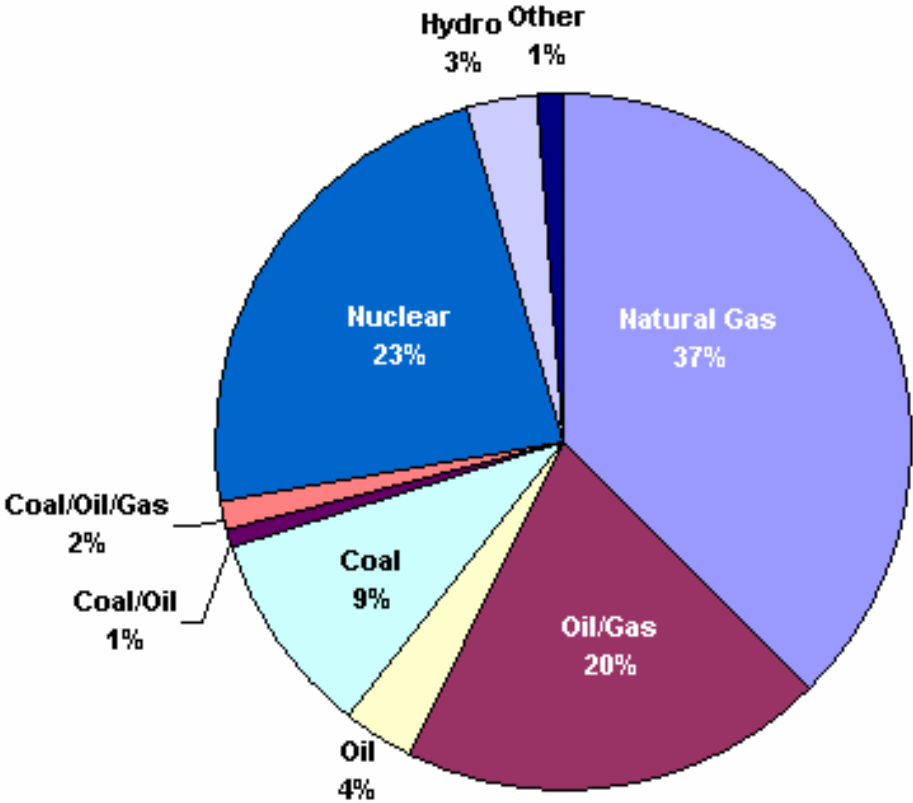
Clean Energy Group Percentage Capacity Mix for Each Company

	Calpine	Conectiv	ConEd	Entergy	Exelon	Keyspan	Northeast Utilities	NEGT	PSEG	Sempra
coal		16.6%		8.9%	2.8%		26.1%	34.6%	23.6%	4.6%
gas	96.1%	59.7%	61.3%	1.2%	16.2%	55.9%		51.0%	15.7%	88.5%
oil		23.7%	17.3%	0.1%	6.2%	14.9%	0.6%		0.9%	
oil/gas			21.4%	56.4%	3.7%	29.3%	13.4%		30.3%	
coal/oil									3.9%	
coal/oil/gas					7.5%					
nuclear				32.2%	57.2%		16.1%		23.6%	6.8%
hydro				0.5%	5.0%		43.8%	13.5%	1.5%	
other	3.9%			0.7%	0.2%			0.9%	0.5%	
dual					1.2%					
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Data from 2003.

Note that these numbers change regularly.

Clean Energy Group Generating Capacity Mix



Background on the Current Legislative Debate

- The 1970 Clean Air Act and 1990 Clean Air Act Amendments establish a framework for reducing harmful emissions from power plants.
- Significant progress has been achieved, but a maze of federal regulations, a patchwork of inconsistent state rules, and escalating litigation, increasingly dominate the scene.
- The resulting complexity and uncertainty have created a difficult investment climate for the electric power sector.
- Various stakeholders are seeking to overhaul current law.
- Debate is focused on the major pollutants emitted by power plants – sulfur dioxide (SO₂), a major contributor to acid rain; nitrogen oxides (NO_x), a major contributor to smog; mercury, linked to neurological issues; and carbon dioxide (CO₂), the leading contributor to global climate change.
- Major legislative proposals to address these issues include the Clean Air Planning Act (CAPA), the Clear Skies Act (CSA), and the Clean Power Act (CPA).
- CAPA will limit emissions from the electric generating industry, address the uncertainty surrounding future action on CO₂, and simplify NSR, thereby creating a more favorable climate for the expansion of U.S. coal markets, stimulating the development of clean coal technologies, and avoiding the potential for stranded investment.
- Under CAPA, both coal and natural gas will continue to play an essential role in the fuel supply.

Timeline: Electric Power Sector Faces Numerous CAA Regulations

NSR Permits for new sources & modifications that increase emissions

Ozone

1-hr Serious Area Attainment Date

OTC NO_x Trading
NO_x SIPs Due

Designate Areas for 8-hr Ozone NAAQS

Section 126 NO_x Controls ¹

1-hr Severe Area Attainment Date

NO_x SIP Call Reductions

Marginal 8-hr Ozone NAAQS

Attainment Date

8-hr Ozone Attainment

Demonstration SIPs due

Assess Effectiveness of Regional Ozone Strategies

Possible Regional NO_x Reductions? (SIP Call II) ²

Moderate 8-hr Ozone NAAQS

Attainment Date

Note: Dotted lines indicate a range of possible dates.

¹ The D.C. Circuit Court has delayed the May 1, 2003 EGU compliance date for the section 126 final rule

² Further action on ozone would be considered based on the 2007 assessment.

³ The SIP-submittal and attainment dates are keyed off the date of designation; for example, if PM or ozone are designated in 2004, the first attainment date is 2009

EPA is required to update the new source performance standards (NSPS) for boilers and turbines every 8 years

Serious 8-hr Ozone NAAQS attainment Date



Mercury Determination

Proposed Utility MACT

Final Utility MACT

Compliance with Utility MACT

Additional HAP Regulation Under 112(d) and (f)

Compliance for BART Sources

Compliance for BART Sources Under the Trading Program

Phase II Acid Rain Compliance

Designate Areas for Fine PM NAAQS

New Fine PM NAAQS Implementation Plans

Latest Attainment Date for Fine PM NAAQS ³

Second Regional Haze SIPs due

Regional Haze SIPs due

Interstate Transport Rule to Address SO₂/NO_x Emissions for Fine PM NAAQS and Regional Haze

In developing the timeline of current CAA requirements, it was necessary for EPA to make assumptions about rulemakings that have not been completed or, in some case, not even started. EPA's rulemakings will be conducted through the usual notice-and-comment process, and the conclusions may vary from these assumptions.

Acid Rain, PM_{2.5}, Haze, Toxics

Methodology/Assumptions Used in Analysis of Costs

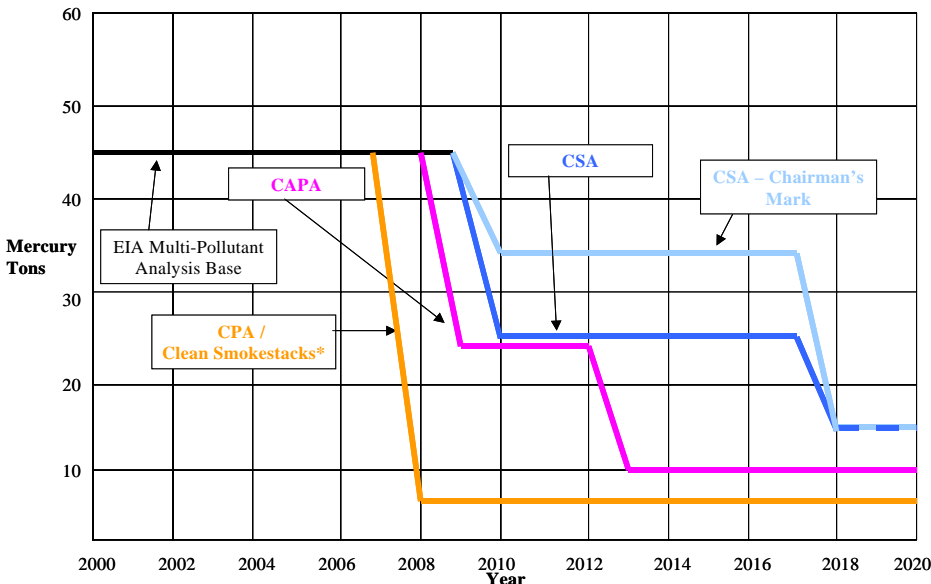
- ICF Consulting's Integrated Planning Model (IPM)
 - Model is widely used by EPA, industry, and NGOs for economic assessments of this nature.
- EPA modeling input assumptions
 - Modeling input assumptions replicated the inputs EPA used in its analyses (2000 IPM) of CAPA and CSA.

Emission Cap Levels and Timetables Associated with Multi-Pollutant Legislative Proposals

Proposal	NO _x	SO ₂	Hg	CO ₂
<p>Clean Air Planning Act: Senate – S 843 - Carper, Chafee, Gregg, Alexander. House HR 3093 - Bass, Davis, Cooper.</p>	<p>1.87 million tons – 2009 (63% reduction 2000 levels)</p> <p>1.7 million tons - 2013 (67% reduction from 2000 levels)</p>	<p>4.5 million tons - 2009 (50% reduction from Phase II Acid Rain cap)</p> <p>3.5 million tons - 2013 (61% reduction from Phase II Acid Rain cap)</p> <p>2.25 million tons - 2016 (75% reduction from Phase II Acid Rain cap)</p>	<p>24 tons – 2009 (50% reduction from 1999 levels)</p> <p>10 tons - 2013 (79% reduction from 1999 levels)</p> <p>Trading allowed, but unit-specific limits of 50% of Hg in delivered coal in 2009 and 30% in 2013.</p>	<p>2005 levels (2.6 billion tons plus flexibility/ offsets) - 2009</p> <p>2001 levels (2.4 billion tons plus flexibility/ offsets) - 2013</p>
<p>Clear Skies Act: Senate – S 485 - Inhofe, Voinovich. House – HR 999 - Barton, Tauzin.</p>	<p>2.1 million tons - 2008 (59% reduction from 2000 levels)</p> <p>1.7 million tons - 2018 (67% reduction from 2000 levels)</p>	<p>4.5 million tons – 2010 (50% reduction from Phase II Acid Rain cap)</p> <p>3.0 million tons – 2018 (67% reduction from Phase II Acid Rain cap)</p>	<p>26 tons - 2010 (46% reduction from 1999 levels)</p> <p>15 tons – 2018 (69% reduction from 1999 levels)</p> <p>Unconstrained Hg trading.</p>	<p>No mandatory CO₂ provisions</p>
<p>Clear Skies Act Chairman’s Mark: Senate – S 1844 – Inhofe</p>	<p>2.19 million tons – 2008 (57% reduction from 2000 levels)</p> <p>1.79 million tons – 2018 (65% reduction from 2000 levels)</p>	<p>4.5 million tons – 2010 (50% reduction from Phase II Acid Rain cap)</p> <p>3.0 million tons – 2018 (67% reduction from Phase II Acid Rain cap)</p>	<p>34 tons – 2010 (29% reduction from 1999 levels)</p> <p>15 tons – 2018 (69% reduction from 1999 levels)</p> <p>Unconstrained Hg trading.</p>	<p>No mandatory CO₂ provisions</p>

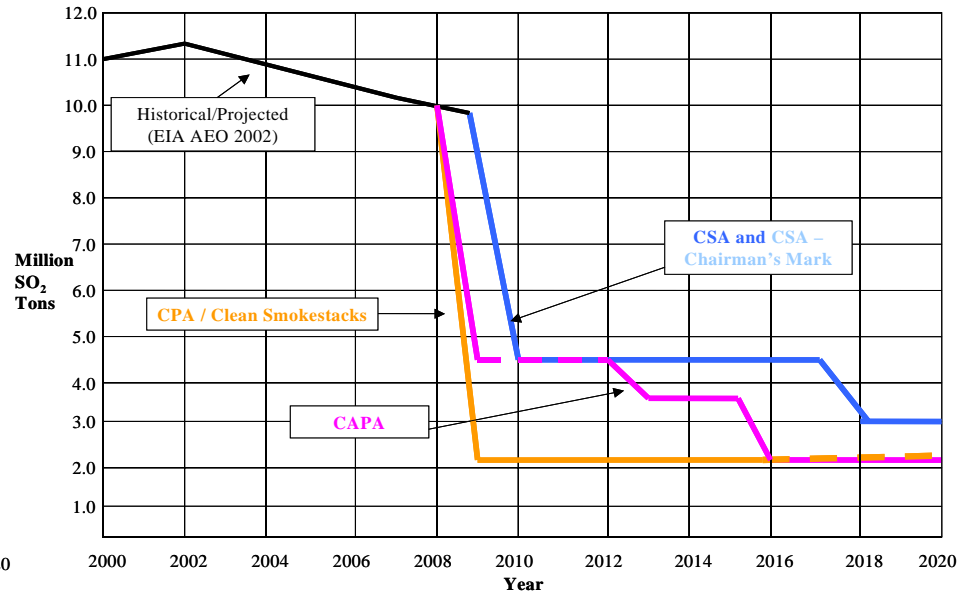
Emissions Reductions Under Multi-Pollutant Legislative Proposals

Comparison of Multi-Pollutant Proposal Hg Emissions Caps

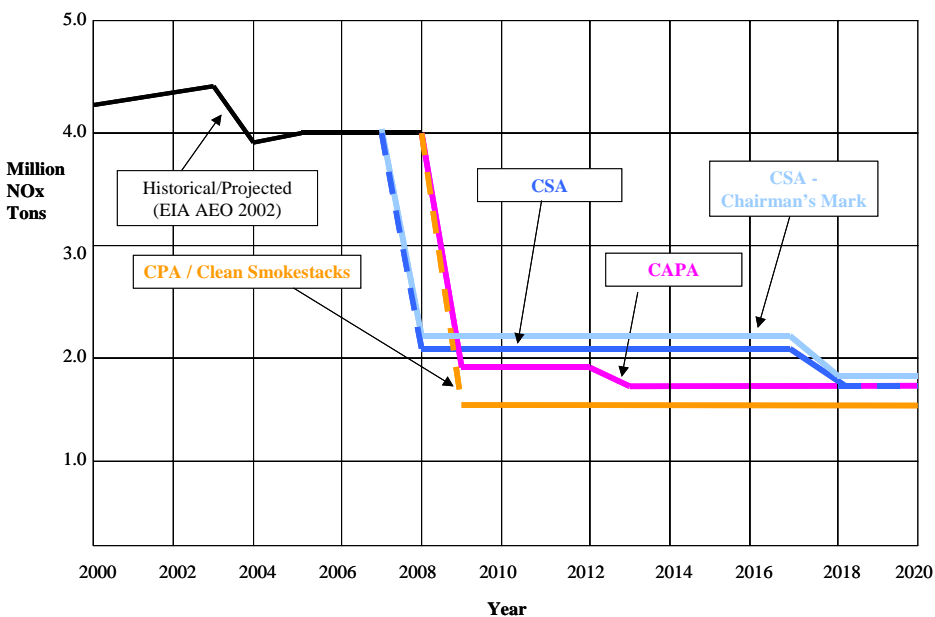


Clean Smokestacks Act mercury target is in 2009, not 2008 as in CPA.

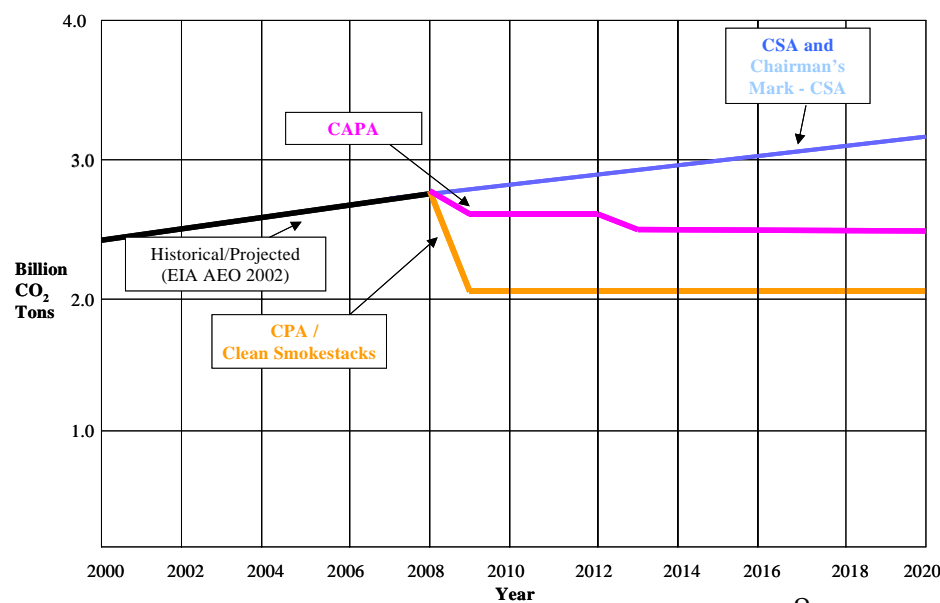
Comparison of Multi-Pollutant Proposal SO₂ Emissions Caps*



Comparison of Multi-Pollutant Proposal NO_x Emissions Caps



Comparison of Multi-Pollutant Proposal CO₂ Emissions Caps*



* This chart does not reflect flexibility measures.

CAPA Provides Substantially More Emissions Reductions and Public Health Benefits than CSA over 20 Years

- an additional 25 million tons of SO₂ reductions;
- an additional 3.3 million tons of NO_x reductions;
- an additional 150 tons of mercury reductions; and
- an additional 6 billion tons of CO₂ reductions via offsets;
- *resulting in roughly \$30 billion in incremental public health benefits per year by 2020.*

Premature Deaths Avoided

Studies have demonstrated an association between increases in fine particle concentrations and increases in morbidity and mortality

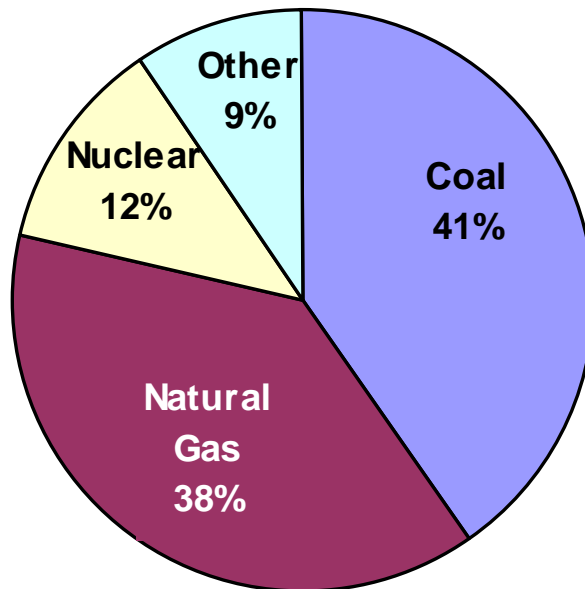
- In 2010, the Clean Air Planning Act is projected to avoid 9,000 premature deaths*
- In 2020, as further emission reductions are implemented, the Clean Air Planning Act is projected to avoid 17,000 premature deaths*

By comparison:

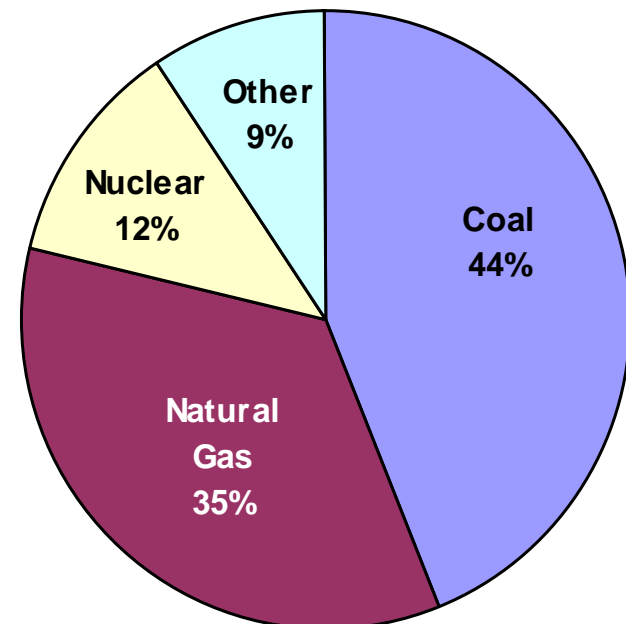
- In 2010, the Clear Skies Act is projected to avoid 7,800 premature deaths*
- In 2020, the Clear Skies Act is projected to avoid 14,100 premature deaths*

Electric Generation Mix Projected in 2020 Under CAPA and CSA

CAPA



CSA

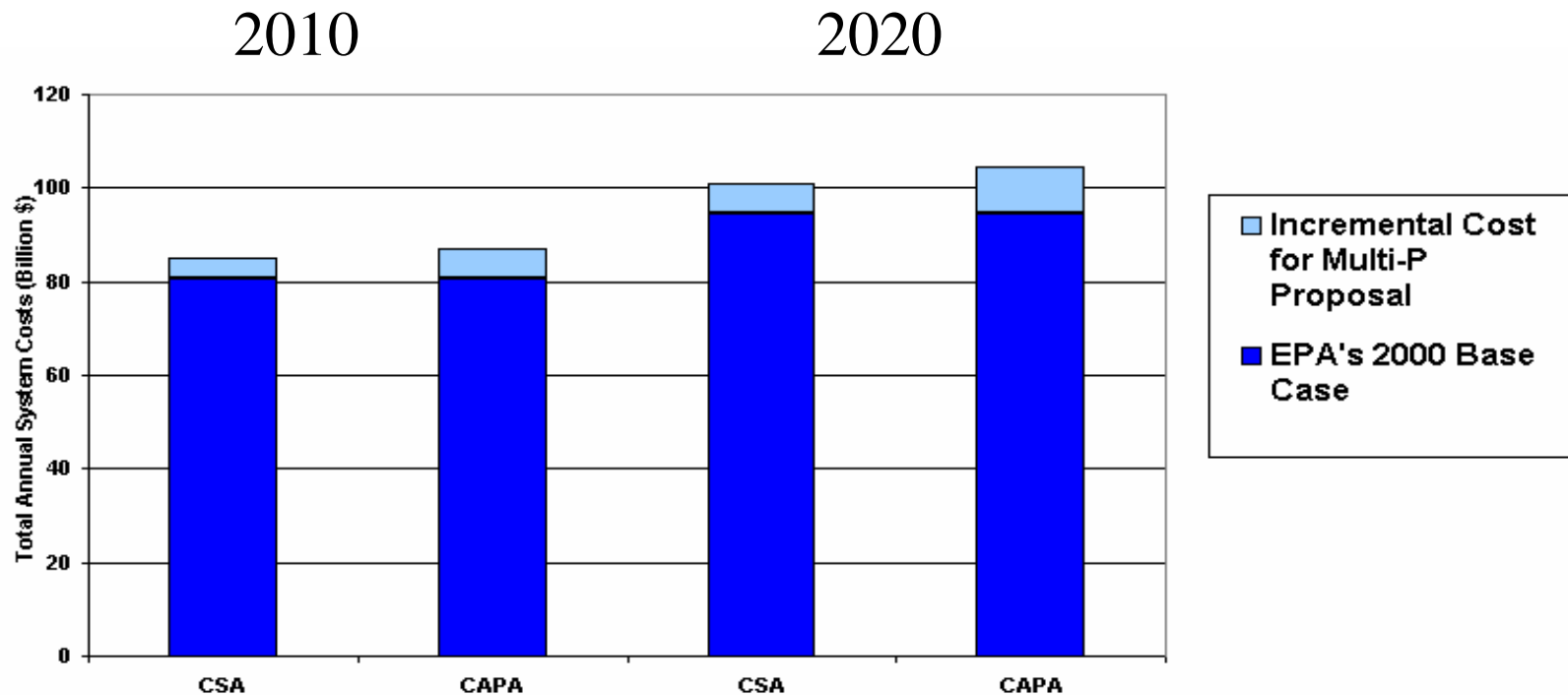


- CAPA maintains a diverse generation mix, similar to today's.
- Under CAPA, coal remains the dominant fuel for electric generation and the market for coal in 2020 will be at least as large as it was in 1990.

The Cost and Energy Impacts Are only Marginally Greater under CAPA than under CSA

- *Total* system costs of CAPA over 20 years (2005-2025) are 2% greater than CSA.
- Average wholesale energy prices in 2020 under CAPA are less than 4% greater than under CSA.
- Average retail energy prices in 2020 under CAPA are less than 2% greater than under CSA.
- Coal use in generating mix in 2020 under CAPA is 3% less than under CSA.
- Gas use in generating mix in 2020 under CAPA is 3% greater than under CSA.

Comparison Between Future Estimated Costs of CSA and CAPA



1. Total annual system costs represent capital, operating and maintenance and fuel costs associated with operating the electric generating system for each scenario.
2. EPA's 2000 Base Case scenario reflects existing federal emission reduction requirements in 2000 including Phase II acid rain requirements and the NO_x SIP call along with state specific regulations for SO₂ and NO_x in Connecticut, NO_x in Missouri and NO_x in Texas. EPA's Base Case **does not** include mercury MACT, NSR settlements, 8-Hour Ozone and Fine PM attainment, regional haze rules, and other 13 state programs, which will raise the price tag of the compliance scenario significantly.

Comparative Cost and Benefit Data: CSA vs. CAPA- EPA Data

	CSA	CAPA		CSA	CAPA
2010 Incremental Benefits (Billion\$)	\$55	\$70	2020 Incremental Benefits (Billion\$)	\$110	\$140
2010 Incremental Costs (Billion\$)	\$4.3	\$6.6	2020 Incremental Costs (Billion\$)	\$6.3	\$9.9
2010 Net Benefits (Billion\$)	\$50.7	\$63.4	2020 Net Benefits (Billion\$)	\$103.7	\$130.1

1. Incremental costs and benefits represent the change resulting in the Multi-P proposals beyond EPA's 2000 Base Case, which does not include all existing regulatory programs currently contemplated under the current Clean Air Act.
2. The difference in incremental costs between CAPA and CSA is primarily attributable to the deeper and earlier reductions in SO₂ and mercury emissions associated with CAPA.
3. CAPA cost and benefits and CSA cost data are from EPA's document responding to requests from the EPW Committee for costs and benefits analysis of multi-pollutant strategies. CSA benefits data are from the Clear Skies web site.

GHG Offsets Keep the Cost of CO₂ Control Low

- CAPA establishes a CO₂ offset program that results in the electric generating sector achieving greenhouse gas (GHG) stabilization in 2013 at 2001 levels.
- Information on the availability and cost of CO₂ offsets used in CEG's modeling analysis is based on EPA's latest greenhouse gas mitigation curves; the model relies on conservative offset assumptions, with only half of the offsets available to the electric generating sector.
- Offsets are from domestic sources, including agricultural and forest sequestration, along with a limited number of international offsets.
- As a result, low CO₂ allowance prices bring the system into compliance. CO₂ allowance prices range from \$2.30 to \$5.30 per ton.

CAPA Creates an Innovative, Effective, and Efficient CO₂ Program

- CAPA addresses CO₂ in the context of multi-pollutant legislation to provide investment certainty:
 - Controlling GHGs is inevitable; many states are establishing GHG initiatives.
 - A pollutant-by-pollutant approach is costly and inefficient, while the cost of adding CO₂ to multi-pollutant legislation under CAPA's approach is minimal over the next 20 years.
 - CAPA establishes a flexible, market-based approach that stabilizes CO₂ emissions at today's levels and creates the framework for more robust CO₂ control efforts.
- Off-system CO₂ credits will create a real incentive for achieving low-cost CO₂ reductions and establish revenue for other sectors, particularly agriculture and forestry:
 - Climate change is not a local issue.
 - Efforts to reduce the overall amount of CO₂ in the atmosphere, including off-system credits, are effective – as effective as achieving reductions at the source of generation.

CAPA Will Foster Investment and Innovation in New Electric Generating Facilities by:

- Creating added value for new electric generating technologies that are more efficient and reduce CO₂ emissions;
- Providing a clear market price signal for CO₂;
- Providing a 20-year period of certainty and stability regarding future air pollutant requirements, including CO₂;
- Creating a national level playing field in terms of regulatory requirements;
- Providing new fossil fuel-fired electric generating units with an allocation of emission allowances, thereby eliminating an important barrier to new sources of generation; and
- Creating a market-based approach that allows companies to optimize their emissions reductions strategies.

Conclusions

- CAPA's 4-pollutant approach provides regulatory and business certainty not afforded by CSA.
- CAPA delivers important public health and environmental benefits while minimizing the economic impact on industry and the consumer.
- CAPA promotes reliability and energy security and results in the continued use of indigenous coal as the primary source of electric power generation.
- By addressing CO₂, simplifying NSR, and creating a more certain investment environment for the next 20 years, CAPA will stimulate innovations in technology, provide a climate for the continued use of coal, and avoid stranded investments.
- CAPA stimulates the development of new generation by setting aside allowances and eliminating the need for offsets, while maintaining effective air quality safeguards, including the rights of states to take actions to meet local air-quality needs.