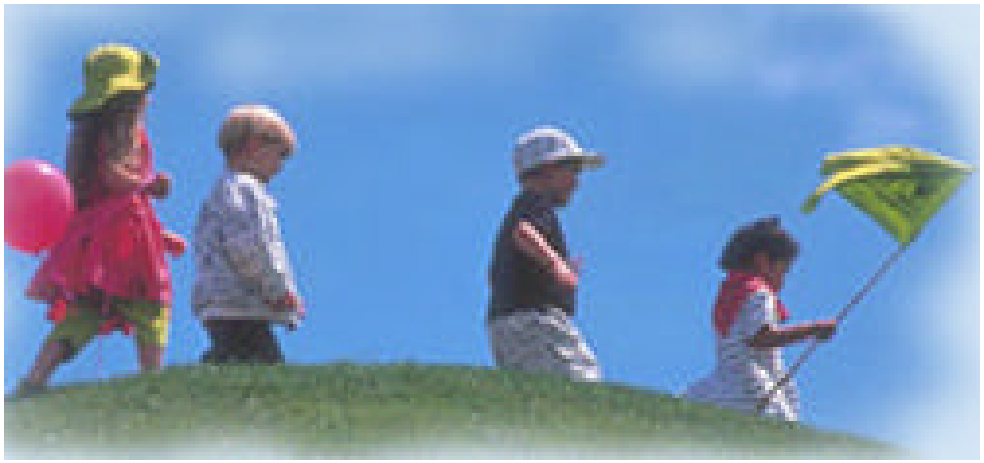
The Clear Skies Initiative



The Clear Skies Initiative

- The Clear Skies Initiative is, by far, the most aggressive action ever proposed by any President to reduce emissions from power plants.
- Prior to President Bush's Clear Skies Initiative, this distinction was held by President George H.W. Bush, who proposed legislation to reduce SO_2 emissions from power plants by approximately 50% from 1990 levels. Congress adopted this proposal in 1990.
- Under the Clear Skies Initiative, power plant emissions of
  - SO_2 will be reduced by 73% from today's levels,
  - NOx will be reduced by 67% from today's levels, and
  - Mercury will be reduced by 69% from today's levels.

The Clear Skies Initiative

- **The Clear Skies Initiative ¾ Building on the Clean Air Act**

  The Clear Skies Initiative is designed to help us meet our national air quality goals. A new Clean Air Act for the 21st century must build on this founding principle – modernization and better technology will mean a progressive new way to accomplish these long-standing environmental goals. The Clear Skies Initiative will bring Americans:

  - Improved air quality,
  - Improved health,
  - Better environmental protection from acid rain, smog, haze, mercury & nitrogen deposition, and
  - Secure, affordable power

- **How the Clear Skies Initiative Works**

  To improve air quality for tens of millions of Americans, the Clear Skies Initiative will adopt the lessons learned from 30 years of environmental regulation by:

  - Establishing mandatory emission caps, based on sound science, that will significantly improve air quality, protecting human and environmental health,
  - Adopting a comprehensive, integrated, multi-pollutant approach,
  - Improving environmental performance at lower cost using market-based mechanisms that create incentives for innovation, and
  - Ensuring a secure, affordable energy supply including the ability to use coal, our most abundant domestic fuel source.

Health and Environmental Benefits of the Clear Skies Initiative

Improved Public Health

- Bring healthier air to tens of millions of people
- Reduce fine particles and smog (ground-level ozone) in highly-populated areas that often fail to meet health-based standards for these pollutants.
- Prevent thousands of premature deaths
- Prevent thousands of new cases of chronic bronchitis, hospitalizations and emergency room visits
- Reduce the number of people with ozone-related health problems, including infection, asthma attacks, and chronic lung damage
- Reduce the risk of mercury exposure to developing fetuses.

Cleaner Water

- Reduce acid rain over broad regions of the U.S.
- Assist in the recovery of many lakes in the Northeast (particularly in the Adirondack Mountains), as well as many streams in the Southeast
- Improve coastal ecosystem health along the East and Gulf coasts by reducing nitrogen loads
- Reduce wildlife exposure to mercury

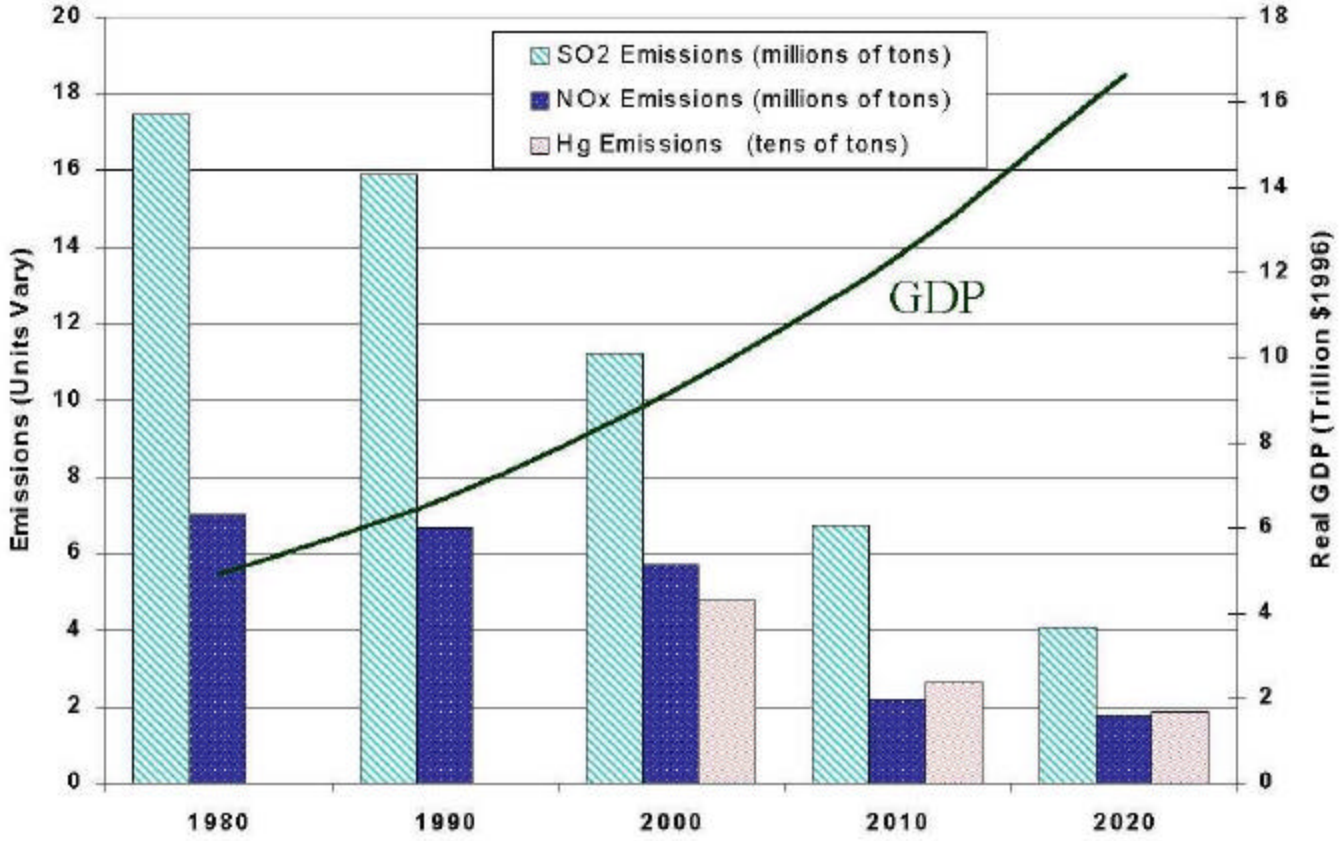
Healthier Forests

- Improve the health of sensitive forest ecosystems, including those in the Appalachian and Rocky Mountains, by reducing acid rain and nitrogen deposition

Improved Visibility

- Reduce regional haze over broad areas of the country
- Improve visibility in the scenic vistas in our national parks, including Great Smoky and Shenandoah

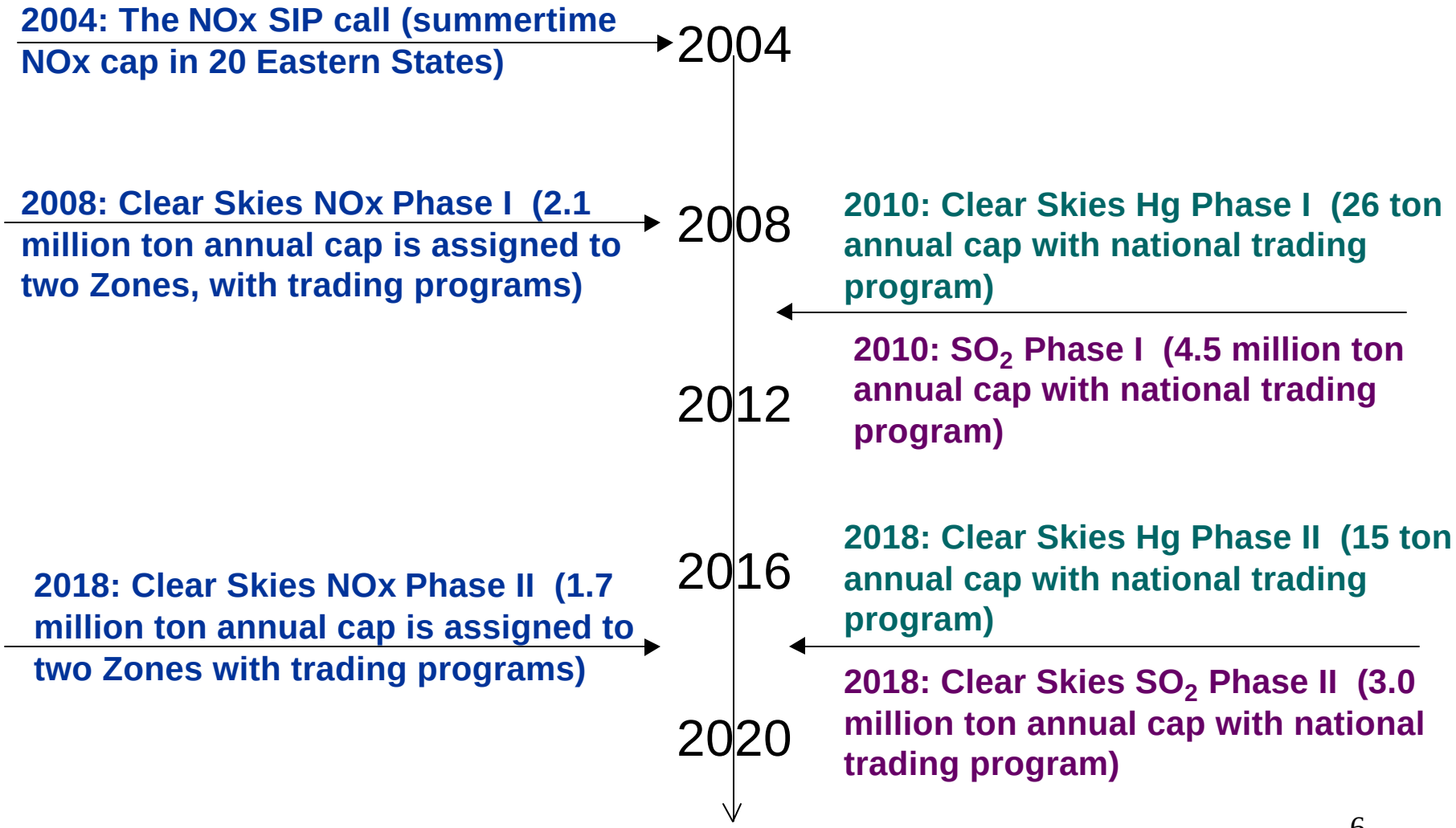
Simultaneous Economic Growth and Environmental Improvement



Sources: 1970 - 1999 emissions data is from the National Air Pollutant Emissions Trend Report, (EPA, March 2000). Projections for SO2 and NOx are derived from the Integrated Planning Model (IPM). GDP data through 2000 is from the Bureau of Economic Analysis, GDP projections follow EIA's assumptions in AEO 2001 of 3% growth per year.

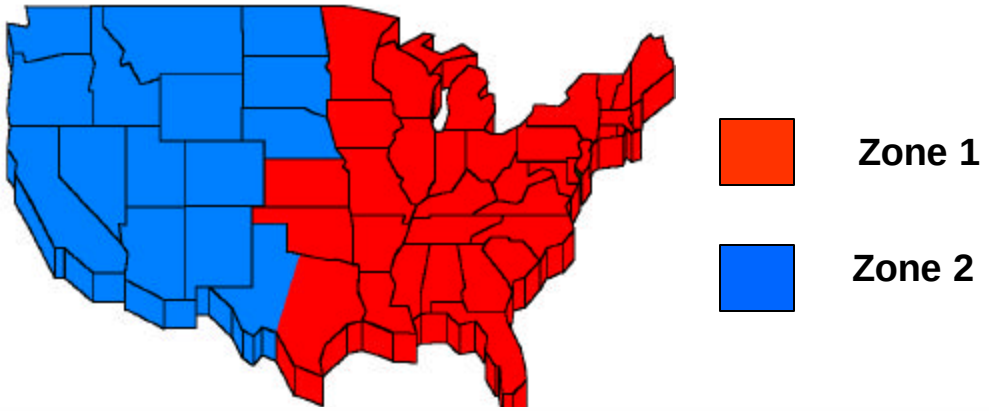
* Note: Emissions data include emissions from all fossil fuel-fired electricity generating units. 2020 emissions are based on the Phase II caps in the Clear Skies Initiative: a 3 million ton cap in 2018 for SO2, a 1.7 million ton cap in 2018 for NOx, and a 15 ton cap in 2018 for Hg.

The Clear Skies Initiative Will Result in Aggressive Environmental Requirements for the Electric Power Sector



The Clear Skies Nitrogen Oxides (NOx) Program

- The Clear Skies Initiative has two trading zones for NOx.



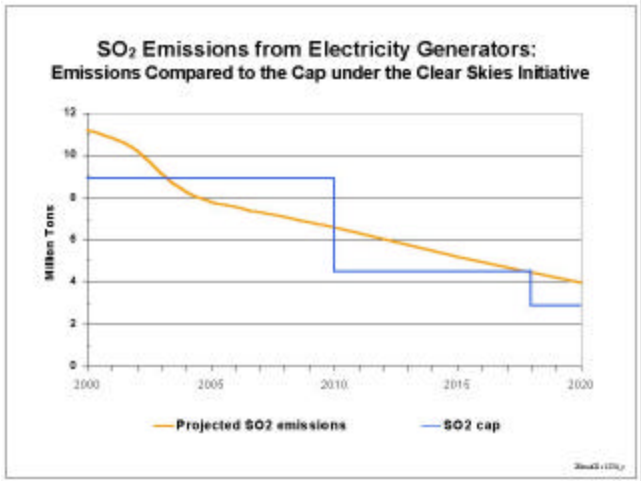
NOx Caps Under The Clear Skies Initiative

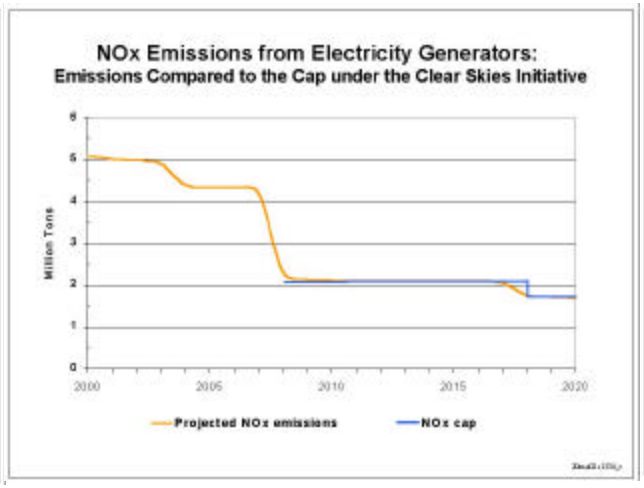
	2000 Emissions			2008 Caps			2018 Caps		
	Total	**Zone 1**	**Zone 2**	**Total**	**Zone 1**	**Zone 2**	**Total**	**Zone 1**	**Zone 2**
Caps *	**5.1 million tons**	4.35 million tons	750,000 tons	**2.1 million tons**	1.582 million tons	538,000 tons	**1.7 million tons**	1.162 million tons	538,000 tons
(effective emissions rate)	**(0.40 lb/mmBtu)**	(0.41 lb/mmbtu)	(0.33 lb/mmBtu)	**(0.16 lb/mmBtu)**	(0.15 lb/mmBtu)	(0.24 lb/mmBtu)	**(0.13 lb/mmBtu)**	(0.11 lb/mmBtu)	(0.24 lb/mmBtu)

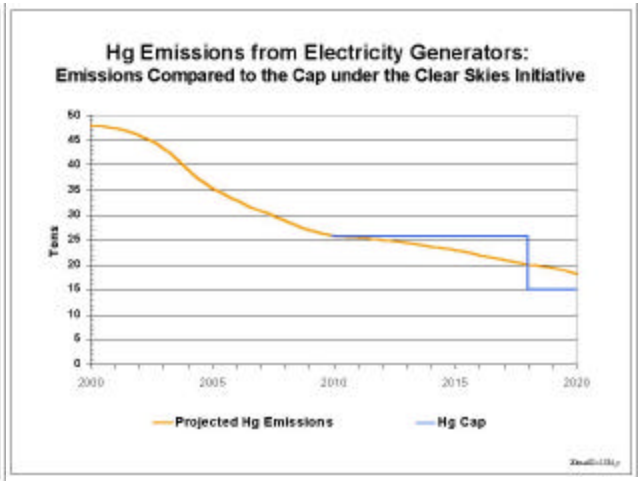
* Numbers for 2000 represent actual emission levels, not caps.

- Significant NOx reductions are required in the East to protect human health and the environment. Less stringent reductions are necessary in the West to maintain good visibility. Therefore, the Clear Skies Initiative creates two trading zones. There would be no trading between the two zones to ensure that the different air quality goals can be met.

Clear Skies Initiative for Electric Generating Units





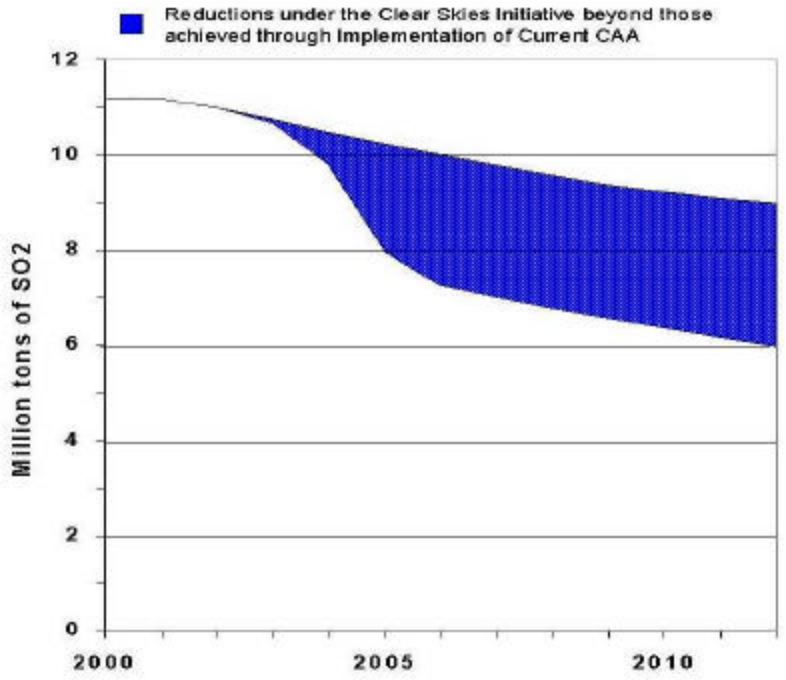


- The Clear Skies Initiative will result in significant over-compliance in the early years because sources are allowed to bank excess emissions reductions and use them later. The use of these banked allowances for compliance in the later years of the program (e.g., 2020) results in SO_2 and mercury emissions above the cap in later years.

Projected SO_2 Emissions from the Electric Power Sector

•**Greater reductions, faster, and with more certainty**: Compared to the current Clean Air Act, the President's initiative will reduce SO_2 by 25 million tons over the next decade.

•This chart shows EPA's projections of the SO_2 emissions reductions that would be achieved from power plants over the next decade under the current Clean Air Act (CAA) and under the President's Clear Skies Initiative. Projections beyond 2012 are more uncertain for the following reasons:



- Under the Clear Skies Initiative, EPA would be required, before 2010, to review new scientific, technology, and cost information and adjust the Phase II (2018) caps if necessary to meet clean air standards.

- Under the existing Clean Air Act, States and EPA will be required to impose new regulations on many sources of SO_2, including power plants, in order to meet new federal standards for fine particles and to improve visibility in national parks. These new regulations will reduce SO_2 emissions from power plants, although the bulk of these reductions are expected to take place after 2012. The exact timing and magnitude of these reductions are also highly uncertain.

- The Clear Skies Initiative would get substantial reductions in SO_2 emissions much earlier than they could possibly be achieved under the CAA. Furthermore, if States need to get additional emissions reductions beyond those mandated under the Clear Skies Initiative, the CAA would continue to require the States to get those reductions and to provide States with a number of regulatory tools to do so.

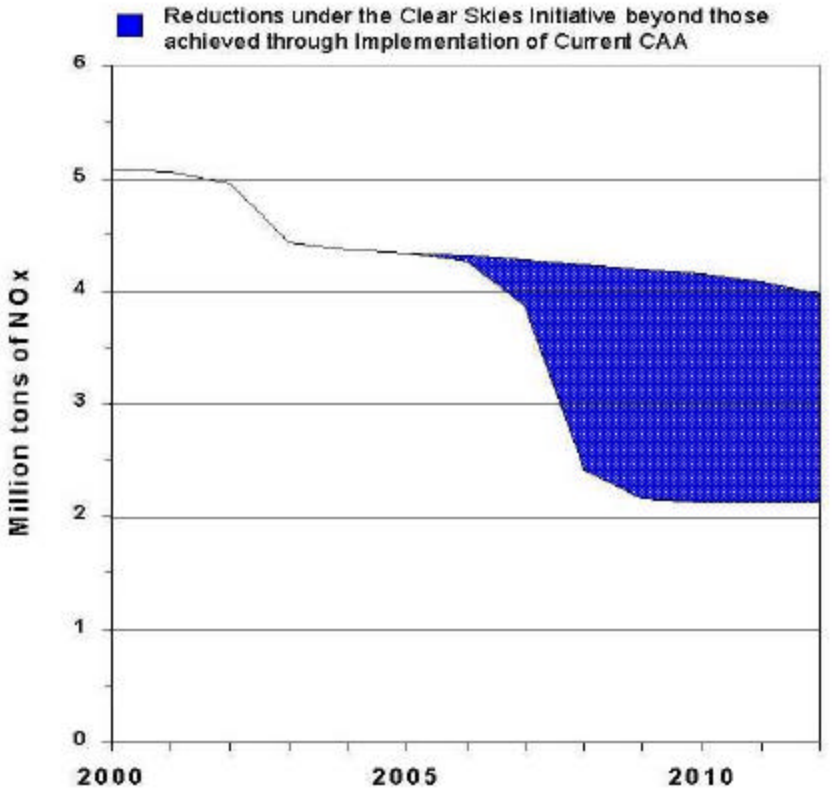
NOx Emissions Under the Clear Skies Initiative

•**Greater reductions, faster, and with more certainty**: Compared to the current Clean Air Act, the President's initiative will reduce NO_X emissions by 10 million tons over the next decade.

•This chart shows EPA's projections of the NO_X emissions reductions that would be achieved from power plants over the next decade under the current Clean Air Act (CAA) and under the President's Clear Skies Initiative. Projections beyond 2012 are more uncertain for the following reasons:

- Under the Clear Skies Initiative, EPA would be required, before 2010, to review new scientific, technology, and cost information and to adjust the Phase II (2018) caps if necessary to meet clean air standards.

- Under the existing Clean Air Act, States and EPA will be required to impose new regulations on many sources of NO_X, including power plants, in order to meet new federal standards for ozone and fine particles and to improve visibility in national parks. These new regulations will likely reduce NO_X emissions from power plants, although the bulk of these reductions are expected to take place after 2012. The exact timing and magnitude of these reductions are also highly uncertain.



•The Clear Skies Initiative would get substantial reductions in NO_X emissions much earlier than they could possibly be achieved under the CAA. Furthermore, if States need to get additional emissions reductions beyond those mandated under the Clear Skies Initiative, the CAA would continue to require the States to get those reductions and to provide States with a number of regulatory tools to do so.

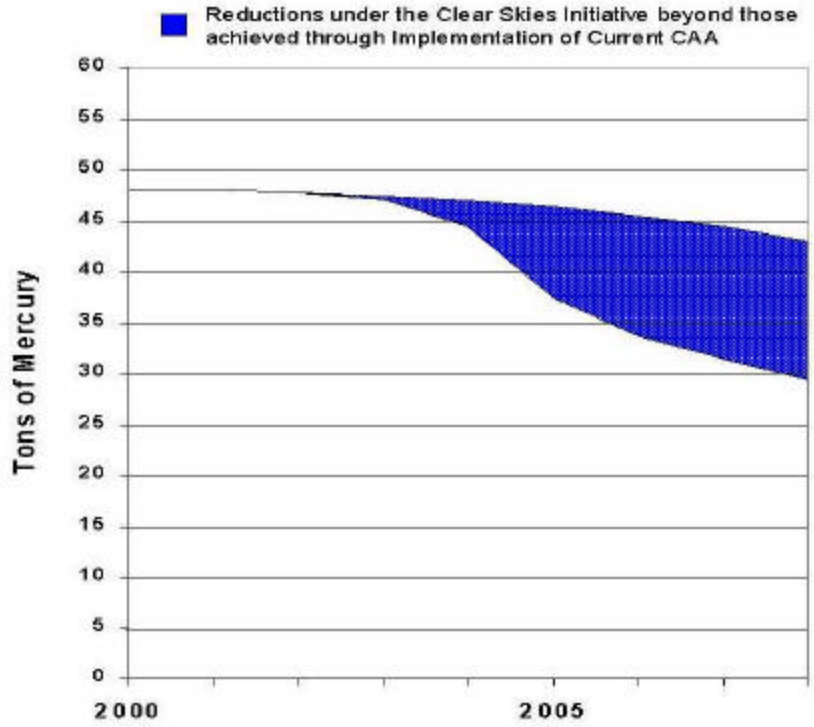
Hg Emissions Under the Clear Skies Initiative

•**Greater reductions, faster, and with more certainty:** Compared to the current Clean Air Act, the President's initiative will reduce mercury emissions by 20 tons over the next 6 years.

•This chart shows EPA's projections of the mercury emissions reductions that would be achieved from power plants over the next 6 years under the current Clean Air Act (CAA) and under the President's Clear Skies Initiative. Projections beyond 2008 are more uncertain for the following reasons:

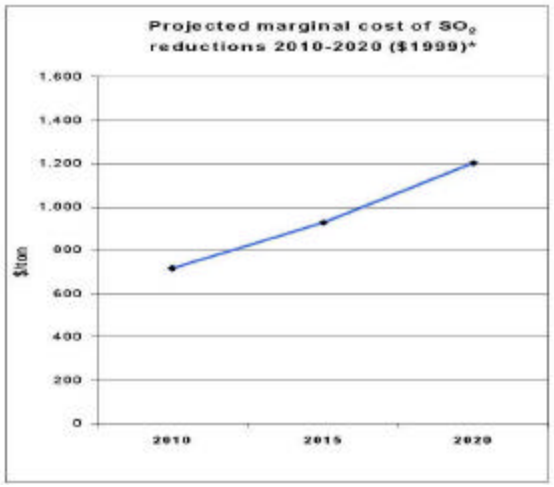
- Under the Clear Skies Initiative, EPA would be required, before 2010, to review new scientific, technology, and cost information and to adjust the Phase II (2018) caps if necessary to meet clean air standards.

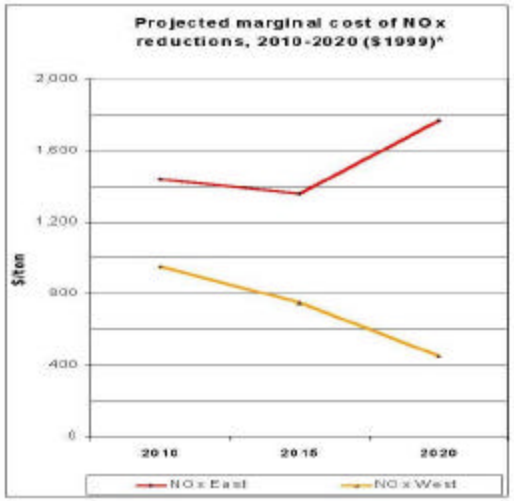
- Under the existing Clean Air Act, EPA is required to set a federal standard for mercury emissions from power plants that would become effective in 2008. The emission reductions that would be required under such a standard are still highly uncertain.

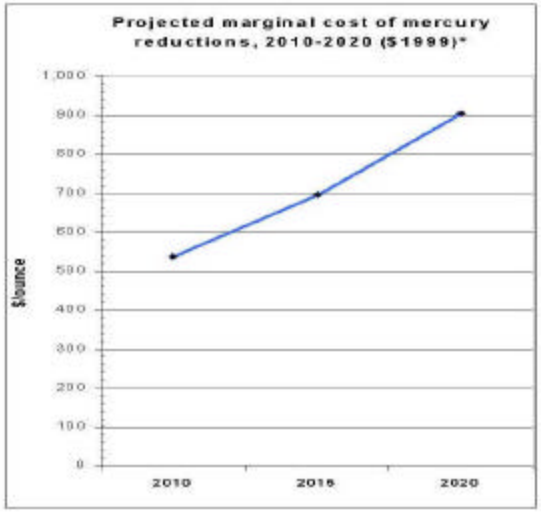


•The Clear Skies Initiative would get substantial reductions in mercury emissions earlier than they will be achieved under the CAA. Furthermore, it would cap mercury emissions into the future, whereas the existing CAA program will allow power plants to increase their future mercury emissions as long as they have installed the required control technology.

Marginal Cost of SO_2, NOx and Hg Reductions Under the Clear Skies Initiative







* Marginal cost projections are EPA's estimates, EIA's modeling would likely show different marginal costs.

- NOTE: Overall, when compared to existing Clean Air Act requirements, the Clear Skies Initiative will likely result in cost savings because a "cap-and-trade" approach is much more efficient than existing regulatory programs. When the Acid Rain Program was implemented using a cap and trade program, compliance costs were significantly lower than predicted as sources took advantage of the flexibility provided by a cap and trade program.

- Under the Clear Skies Initiative, the marginal costs of SO_2 and NOx reductions are well below $2,000/ton and the marginal cost of mercury reductions are below $1,000/ounce.

- The marginal cost of reducing SO_2 and NOx emissions from power generators under EPA's proposal is significantly less than the *average cost* of reducing emissions from other sectors. For example, under the Tier II and heavy-duty diesel rules, the average cost of removing a ton of NOx is estimated at about $2,000/ton.

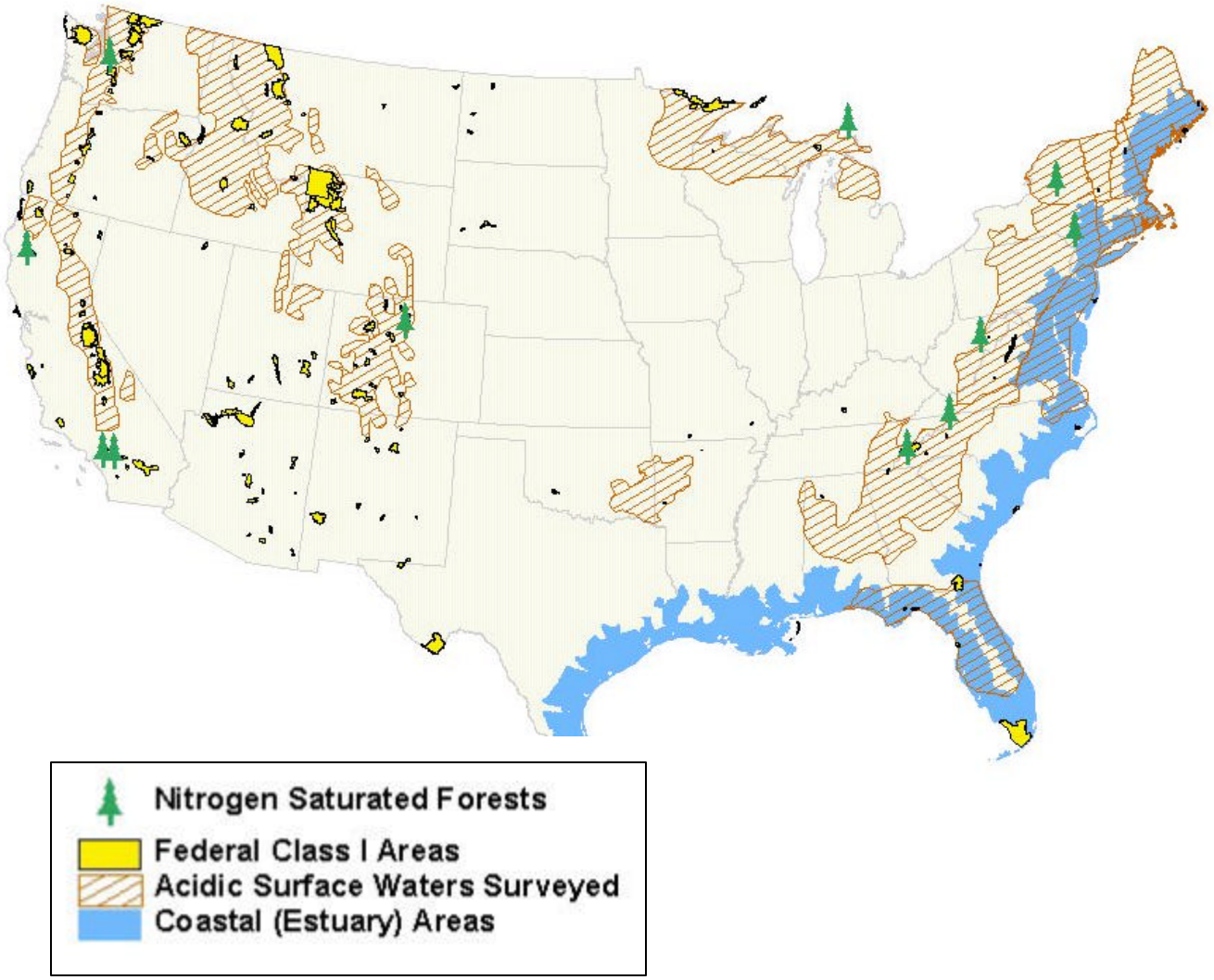
What Are the Impacts of the Clear Skies Initiative?

- The Clear Skies Initiative will dramatically reduce emissions of SO_2, NOx, and mercury from power generation. When fully implemented, these emissions will be reduced by approximately 70% from current levels.
- Because cap-and-trade programs are market-based and more efficient than command-and-control programs, they reduce emissions at a lower cost.
  - Allows for fuel diversity in America's energy future by relying on control technologies, rather than fuel-switching, to achieve the caps.
  - Significantly reduces the State resources needed to conduct modeling, planning and regulatory activities to meet State and federal regulatory requirements (these requirements would be achieved instead by the reductions required under the Clear Skies Initiative).
  - Residential, commercial and industrial consumers are expected to pay less for electricity than they do today.

Human Health Benefits of the Clear Skies Initiative

- **There will be significant and early benefits under the Clear Skies Initiative due to reductions in fine particulate matter ($PM_{2.5}$):**
  - Thousands fewer premature deaths;
  - Tens of thousands fewer new cases of chronic bronchitis;
  - Tens of thousands of fewer respiratory- and cardiovascular-related hospital admissions and emergency room visits;
  - Millions of fewer incidences of aggravated asthma and respiratory symptoms;
  - Reduced risk of childhood illnesses.
- **The health benefits due to reductions in fine particulate matter alone outweigh the total cost of the Clear Skies Initiative.**

Environmentally Sensitive Areas



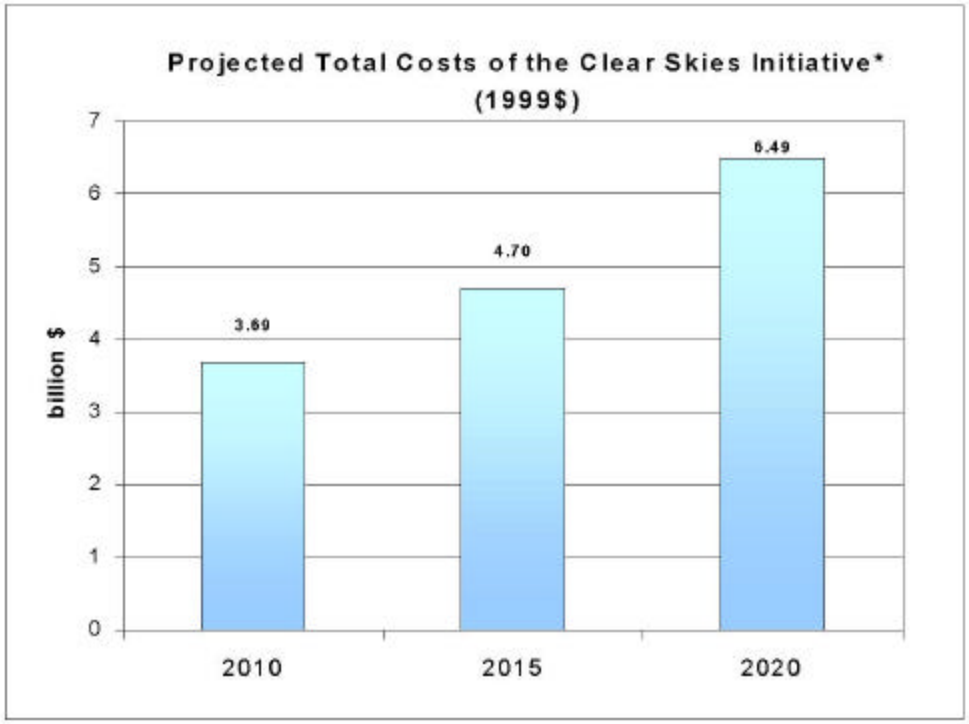
- The pollutants covered in the Clear Skies Initiative -- sulfur dioxide, nitrogen oxides, and mercury -- affect sensitive areas nationwide.
- Many of these sensitive areas will benefit from the early reductions in atmospheric deposition of sulfur, nitrogen, and mercury due to the Clear Skies Initiative.

Note: Nitrogen saturation occurs when nitrogen inputs exceed the ability of the forest to use nitrogen, leading to loss of plant productivity and acidification of surface waters. Class I federal areas include 156 national parks, wilderness areas, and national memorial parks across the U.S.

Environmental and Human Health Benefits of Reducing Mercury

- Power generation is the largest remaining man-made source of mercury emissions (~37% of total in 1999) in the U.S.
- The Clear Skies Initiative will cut those mercury emissions by 69% when fully implemented.
- Under the Initiative, the primary reductions in mercury emissions will be in the “ionic” form, the type of mercury that is prone to deposit close to its sources.
- These emissions reductions will reduce the exposure of high risk populations and sensitive wildlife over large geographic areas.
    - States may be able to redesignate local water bodies as safe (currently 42 States have fish advisories.)

Projected Annual Costs of the Clear Skies Initiative



Notes:

- Cost projections assume the Phase II caps.
- Cost projections are EPA's estimates; EIA's modeling would likely show different costs.

NOTE: These projections show the costs to power generators over and above the costs they have already incurred to meet statutory and regulatory requirements that are already in effect. In the absence of Clear Skies legislation, there are existing statutory provisions that will, in the future, require EPA and states to impose additional requirements (and thus additional costs) on power generators between now and 2020. Because Clear Skies would use a highly-efficient cap-and-trade approach, it may be less costly in the future than continued implementation of existing law, even though it could achieve greater emissions reductions.

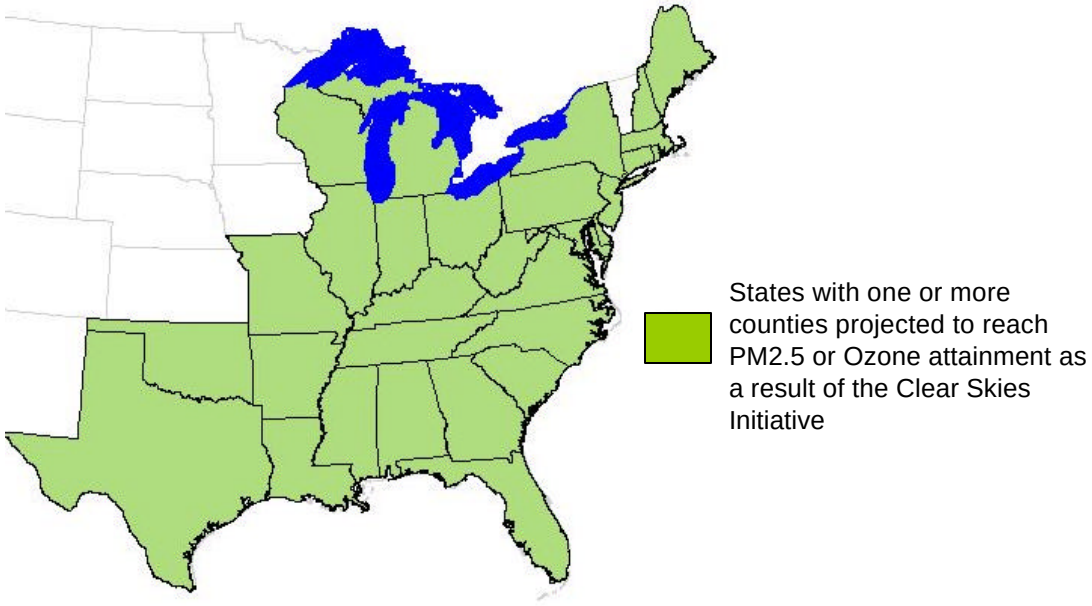
Ensures Secure and Affordable Energy Supply

- **Fuel Diversity**: The Clear Skies Initiative will result in a net increase in national coal production when compared to current levels.
  - Compared to current levels (2000), national coal production for the power industry in 2020 is projected to be 7% higher under the Clear Skies Initiative.

- **Diverse New Generation**: Even with stringent caps, the regulatory certainty and long planning horizon provided by the Clear Skies Initiative will allow the power industry to build and bring on-line new clean coal plants.

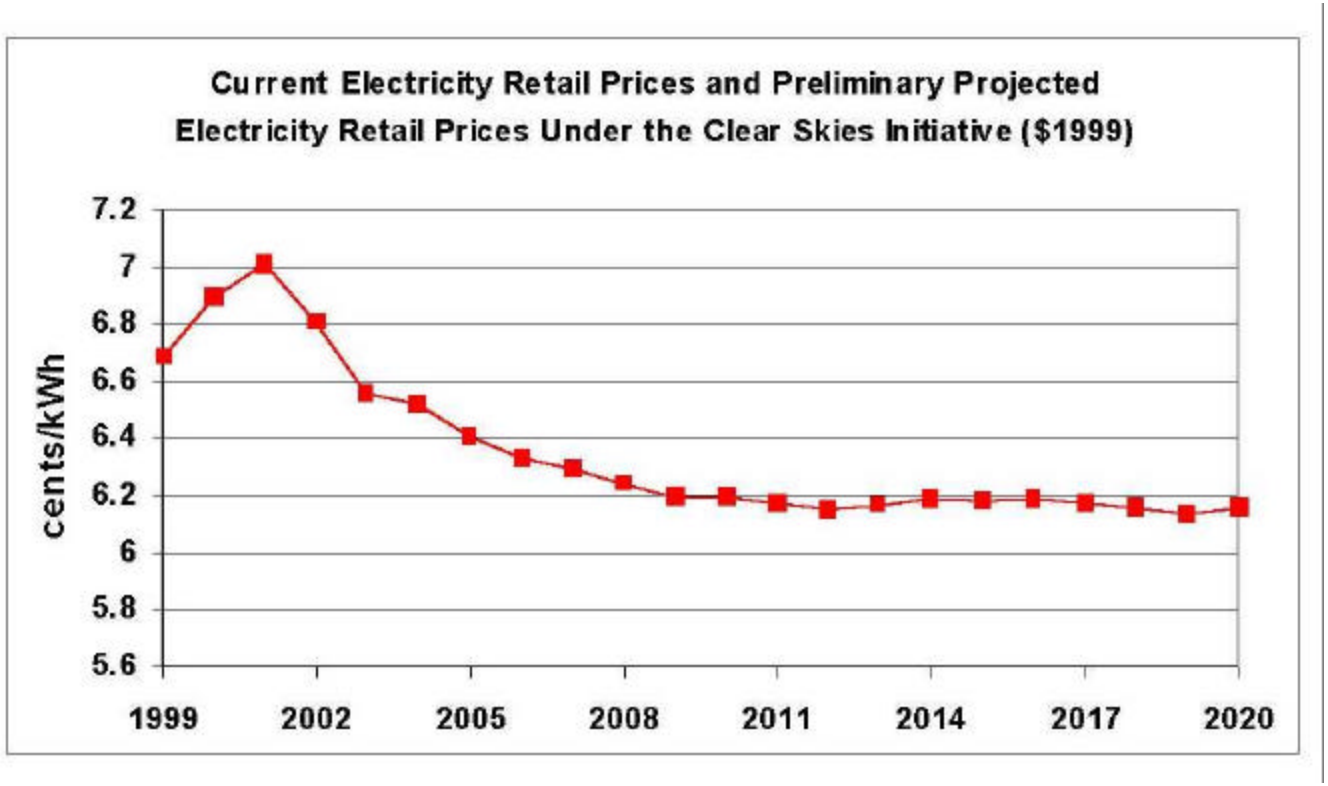
Reduces the Burden on Federal and State Governments

- Clear Skies Initiative will help state and local governments achieve air quality standards without requiring more expensive reductions from other sectors.
- Numerous counties, particularly in the East, that currently do not meet the ozone or the particulate matter ($PM_{2.5}$) standards will meet these standards under the Clear Skies Initiative.
- Air quality in the remaining non-attaining counties will be improved, facilitating local attainment planning.



- Millions of people who live in counties that will meet the $PM_{2.5}$ standard earlier will have fewer respiratory and cardiac problems.
- States avoid having to develop a patchwork of different regulations needed to address SO_2, NOx and Hg emissions from power generators.

Electricity Prices for Residential, Commercial, and Industrial Customers



- Although reducing pollution will require expenditures by power companies, in 2020, net electricity prices are expected to be lower under only the Clear Skies Initiative than recent (2000) prices. The efficient structure of a cap-and-trade program helps to keep the prices low.