

US EPA ARCHIVE DOCUMENT



The Clear Skies Act of 2003

Texas and Clear Skies



Highlights of Clear Skies in Texas

- Texas already has in place state requirements that will substantially reduce emissions of SO₂ and NO_x in the State.
- Clear Skies achieves additional emission reductions in Texas, particularly for SO₂ and mercury; sources would reduce emissions of SO₂ by 40%, NO_x by 22%, and mercury by 45% by 2020 due to Clear Skies.
- The health benefits in Texas would total \$4.1 billion annually (\$750 million under the alternative estimate) and include approximately 500 fewer premature deaths (300 under the alternative estimate) and 1,300 fewer hospitalizations/emergency room visits each year.
- In addition, Texas would receive environmental benefits, including improved visibility. The value of this benefit for Texas residents who visit America's National Parks and Wilderness Areas nationwide is \$180 million.
- Clear Skies does not significantly impact electricity prices. With or without Clear Skies, electricity prices in the electricity supply region that includes Texas are expected to remain below or near 2000 prices.

Clear Skies: An Innovative Approach to Improving Human Health and the Environment

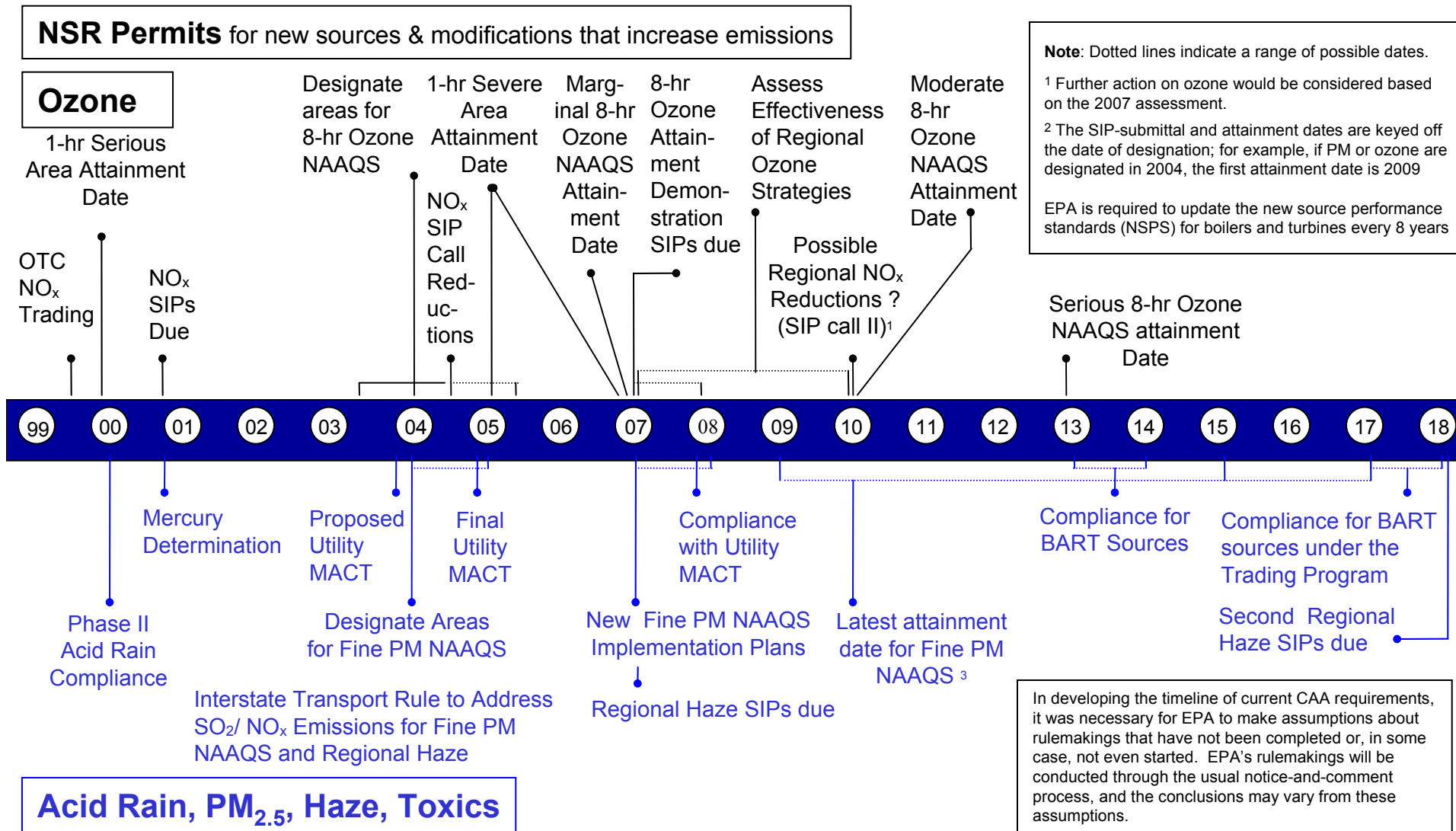
Why Clear Skies?

- **Air quality has improved, but serious concerns persist**
 - Texas citizens suffer ill effects from air pollution, including asthma attacks and premature death
- **Electricity generation sector remains a major emissions source**
 - Very cost-effective to control the power sector, relative to other sources
 - Sources are concerned about upcoming complex and burdensome regulations

Advantages of the Clear Skies Approach

- **Guarantees significant nationwide emissions reductions – beginning years before full implementation**
 - Texas sources would substantially reduce emissions of SO₂, NO_x, and mercury
 - Delivers dramatic progress towards achievement of critical health and environmental goals
- **Uses proven, market-based flexible approach with incentives for innovation**
 - Recognizes environmental needs as well as industry constraints, allowing industry to better manage its operations and finances while lowering risks to the public
 - Sources are projected to install pollution controls to enable continued reliance on coal
- **Increases certainty across the board for industry, regulators, and consumers**

Under Current Clean Air Act Power Plants Would Face a Complex Set of Requirements



Clear Skies Sets a Firm Timeline for Emission Reductions

2004: The NO_x SIP call (summertime NO_x cap in 19 Eastern States + D.C.)

2004

The existing Title IV SO₂ cap-and-trade program provides an incentive and a mechanism to begin reductions upon enactment of Clear Skies years before regulatory action under the current Act.

2008: Clear Skies NO_x Phase I (2.1 million ton annual cap assigned to two Zones with trading programs)

2008

2010: Clear Skies Hg Phase I (26 ton annual cap with a national trading program)

2010

2010: SO₂ Phase I (4.5 million ton annual cap with a national trading program)

2018: Clear Skies NO_x Phase II (1.7 million ton annual cap assigned to two Zones with trading programs)

2018

2018: Clear Skies Hg Phase II (15 ton annual cap with a national trading program)

2018: Clear Skies SO₂ Phase II (3.0 million ton annual cap with a national trading program)

Clear Skies Health and Air Quality Benefits in Texas

Improve Public Health

- **Reduced ozone and fine particle exposure** by 2020 would result in public health benefits of:
 - approximately 500 fewer premature deaths each year¹
 - approximately 400 fewer cases of chronic bronchitis each year
 - approximately 800 fewer non-fatal heart attacks each year
 - approximately 1,300 fewer hospital and emergency room visits each year
 - approximately 74,000 fewer days workers are out sick due to respiratory symptoms each year
 - approximately 9,500 fewer school absences each year
- **Reduced mercury emissions** would reduce exposure to mercury through consumption of contaminated fish, resulting in additional, unquantified benefits to those who eat fish from Texas' lakes, streams, and coastal waters.

By 2020, Texas would receive approximately \$4.1 billion in annual health benefits from reductions in fine particle and ozone concentrations alone due to Clear Skies.¹

Help Maintain Health-Based Air Quality Standards²

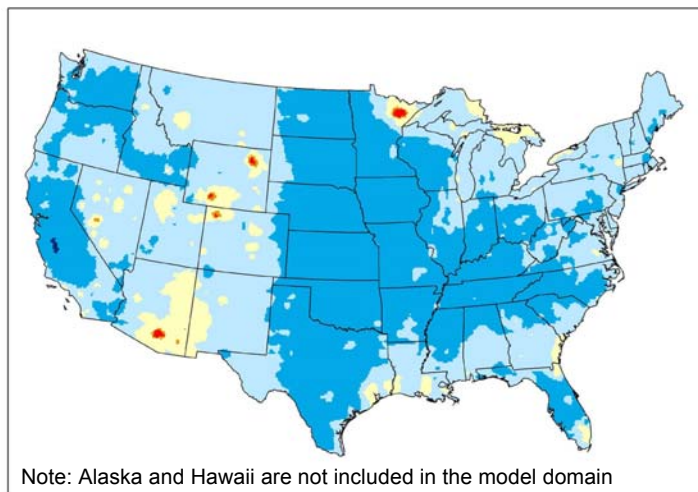
- Twelve counties in Texas currently exceed the 8-hour ozone standard.
- Seven of those counties (population approximately 4 million) would be brought into attainment with the ozone standard under existing programs by 2010.
- An additional 3 counties (population over 2 million) would be brought into attainment with the ozone standard under existing programs by 2020.
- Clear Skies would reduce concentrations of ozone in the remaining two nonattainment counties (Galveston and Harris counties).

1. An alternative methodology for calculating health-related benefits projects approximately 300 premature deaths prevented and \$750 million in health benefits each year in Texas by 2020.

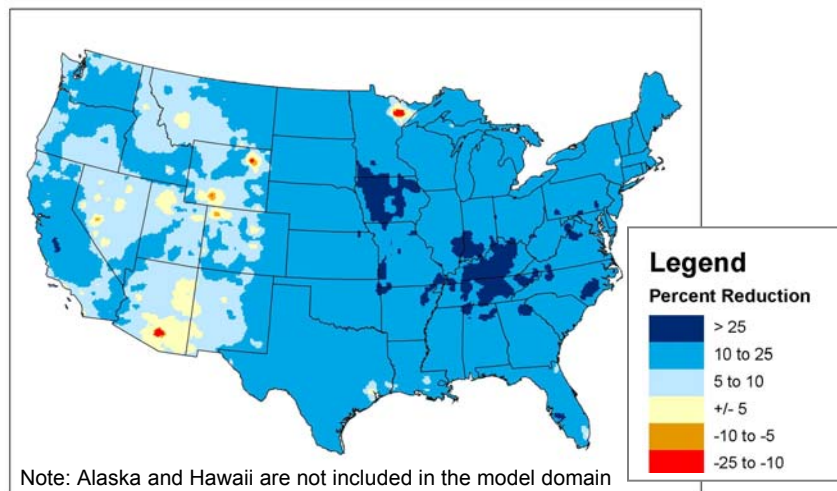
2. Based on 1999-2001 data for counties with monitors that have three years of complete data.

Clear Skies Environmental Benefits in Texas

Projected Changes in Fine Particles with the Base Case in 2020 Compared to 2001



Projected Changes in Fine Particles with Clear Skies and the Base Case in 2020 Compared to 2001



Clear Skies Would Provide Substantial Environmental Benefits in Texas

In comparison to existing programs,

- **Visibility would improve** perceptibly.
 - The value of this benefit for Texas residents who visit America's National Parks and Wilderness Areas is \$180 million.
- **Fine particle concentrations would decrease** by up to 10% throughout much of the state.
- **Sulfur deposition, a primary cause of acid rain, would decrease 15-30%** in parts of East Texas and up to 15% throughout most of the rest of the state.
- **Nitrogen deposition, a cause of damage in nitrogen-sensitive coastal waters, would decrease** by up to 20% in portions of central and western Texas.
- **Mercury deposition would decrease up to 15%*** in some eastern portions of the state.

* These results are based on modeling the Clear Skies mercury cap without triggering the safety valve.

Note: The increases in fine particle concentrations in Minnesota, Arizona, Wyoming, and in the intermountain West occur under both the Base Case and Clear Skies and are the result of increases in emissions from metal smelting, mining, and other sources not affected by Clear Skies.

Emissions in Texas under Clear Skies

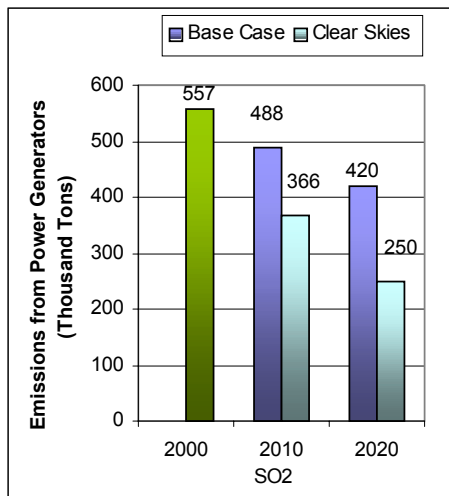
Emissions in Texas (2020) would be significantly reduced from 2000 levels:

- 55% reduction in SO₂ emissions
- 59% reduction in NO_x emissions
- 61% reduction in mercury emissions

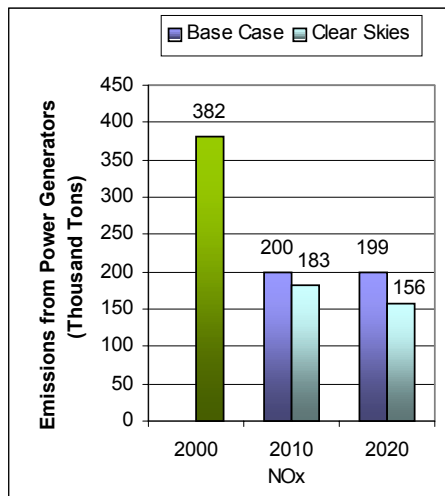
These reductions are partially attributable to Texas' state requirements. Clear Skies gets an additional 40% reduction in SO₂ emissions and an additional 45% reduction in mercury emissions beyond what Texas' rule would achieve in 2020.

Emissions: Current (2000) and Existing Clean Air Act Regulations (base case*) vs. Clear Skies in Texas in 2010 and 2020

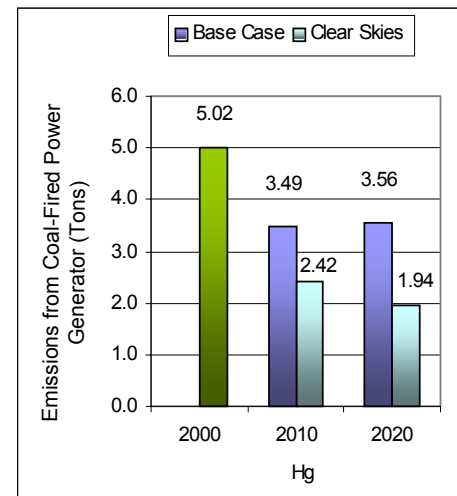
Sulfur dioxide



Nitrogen oxides



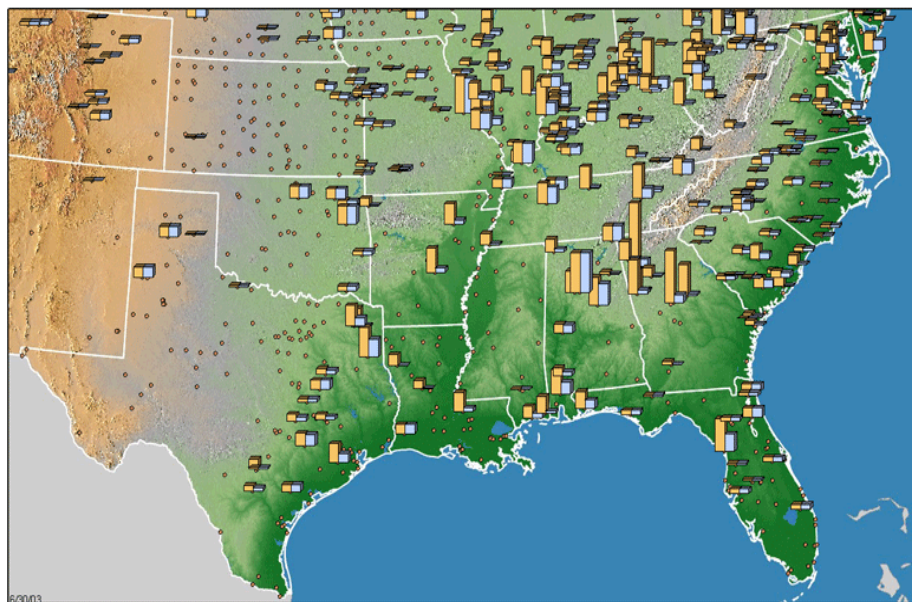
Mercury



Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

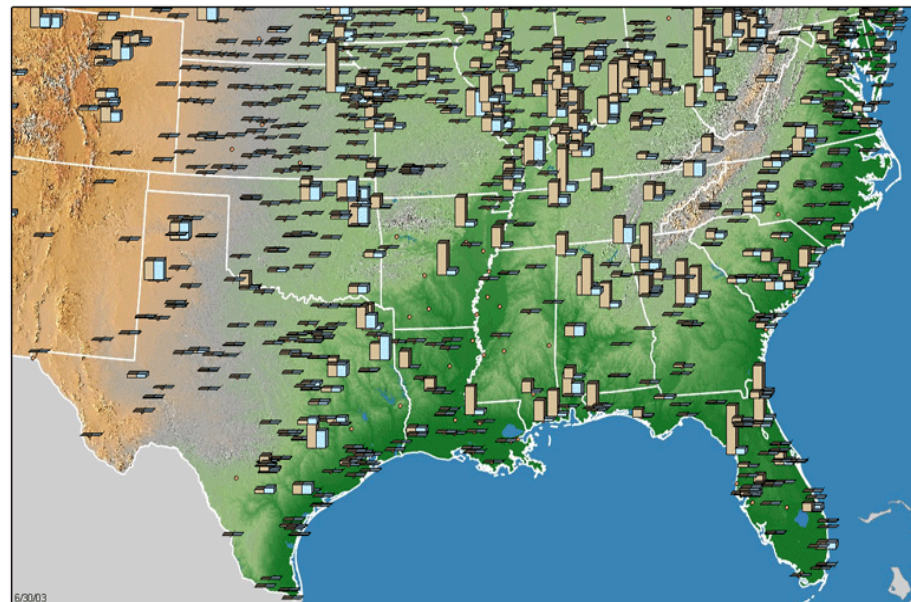
SO₂ and NO_x Emissions Reductions under Clear Skies

Emissions in Texas and surrounding states would decrease considerably. These emission reductions would make it much easier for Texas to attain and maintain compliance with the national air quality standards.



Projected SO₂ Emissions from Power Plants with the Base Case and Clear Skies (2020)
South

- 75,000 tons
- Base Case Power Plant SO₂
- Clear Skies Power Plant SO₂
- Fossil Power Plants with Negligible SO₂ Emissions



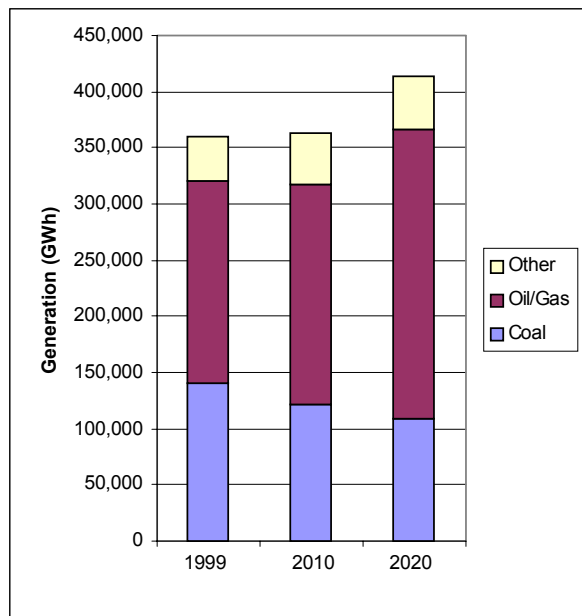
Projected NO_x Emissions from Power Plants with the Base Case and Clear Skies (2020)
South

- 22,000 tons
- Base Case Power Plant NO_x
- Clear Skies Power Plant NO_x
- Fossil Power Plants with Negligible NO_x Emissions

Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

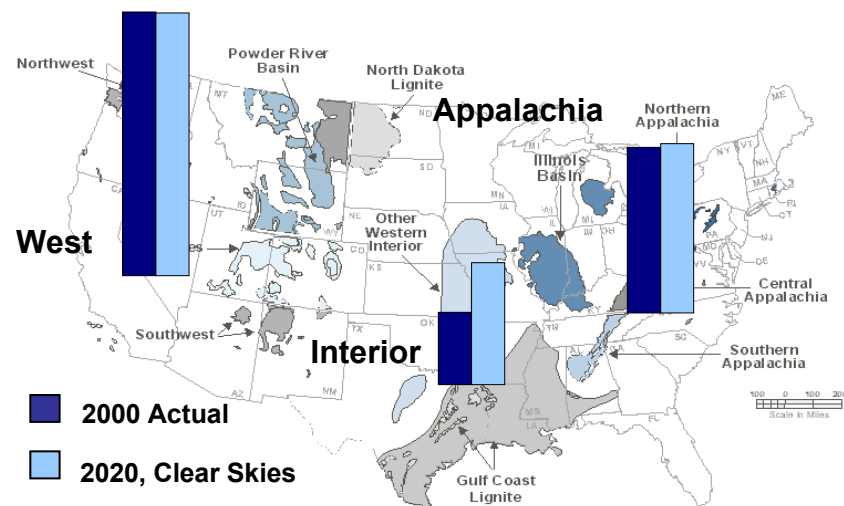
Electricity Generation in Texas under Clear Skies

Current and Projected Generation by Fuel Type in Texas under Clear Skies (GWh)



- Texas' sources are projected to reduce their emissions through the installation of emission controls, rather than through a switch from coal to natural gas.
 - In 2010, 76% of Texas' coal-fired generation is projected to come from units with advanced SO₂, NO_x and/or mercury control equipment that also substantially reduce mercury emissions; in 2020, the percentage is projected to increase to 81%.

Current and Projected Coal Production for Electricity Generation



Scale: Appalachia 2000 = 299 million tons

Emission Controls in Texas under Clear Skies

• Under Clear Skies by 2020...

- 27% of coal-fired capacity would install SCR
- 24% would install scrubbers
- 3% would install mercury controls

• The major generation companies in Texas include:

- TXU Electric Company
- Central Power & Light Company
- San Antonio Public Service Board
- Southwestern Electric Power Company
- Houston Lighting & Power Company
- Calpine

• Total coal-fired capacity in Texas is projected to be 18,701 MW in 2010

Units in Texas Projected to Be Retrofitted Due to Clear Skies by 2020

Plant Name	Unit ID	Technology
J T DEELY	1	SCR* / Scrubber*
J T DEELY	2	SCR* / Scrubber*
SAM SEYMOUR	1	SCR / Scrubber
SAM SEYMOUR	2	SCR / Scrubber
W A PARISH	WAP5	Scrubber
W A PARISH	WAP7	Scrubber
WELSH	1	SCR* / Scrubber*
WELSH	2	SCR* / Scrubber*
WELSH	3	SCR* / Scrubber*
J K SPRUCE	BLR1	SCR
OKLAUNION	1	SCR*
SAM SEYMOUR	3	SCR*
MONTICELLO	1	ACI*

* Retrofit was installed under Clear Skies by 2010

Notes:

[1] Retrofits and total coal-fired capacity apply to coal units greater than 25 MW.

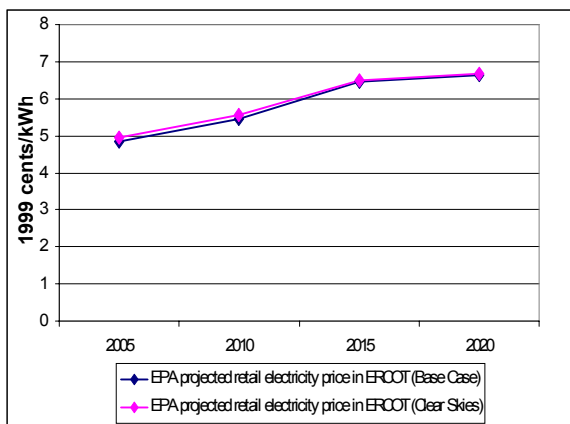
[2] Pirkey unit 1 is projected to be removed from operation by 2005 with Clear Skies due to excess gas-fired capacity in the marketplace, unless otherwise needed for voltage purposes. The recent overbuild of gas-fired generation reduces the need for less efficient units operating at lower capacity factors. These units are inefficient compared to other coal-fired plants and newer gas-fired generation. Less conservative assumptions regarding natural gas prices or electricity demand would create a greater incentive to keep these units operational.

Electricity Prices in Texas under Clear Skies

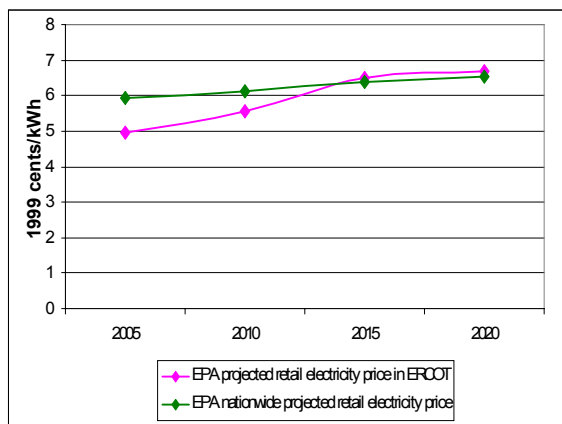
- With or without Clear Skies, retail prices in the North American Electric Reliability Council (NERC) ERCOT region (the electricity supply region that contains Texas) are projected to increase between 2005 and 2020.
- With Clear Skies, retail prices are projected to be approximately 0.6 – 2.3% higher between 2005 and 2020 than in the absence of the legislation.



Projected Retail Electricity Prices in Texas under the Base Case and Clear Skies (2005-2020)



Projected National Retail Electricity Prices and Prices in Texas under Clear Skies (2005-2020)



In 2000, the average retail electricity price in Texas was approximately 6.5 cents/kWh, which was below the average *national* retail price of approximately 6.7 cents/kWh.

Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

Costs and Benefits in Texas under Clear Skies

Benefits Outweigh the Costs

- **In Texas, Clear Skies is projected to cost approximately \$458 million annually by 2020 while providing health and visibility benefits totaling approximately \$4.2 billion annually.**
- **The increases in production costs under Clear Skies represent only a small percentage of total retail electricity sales revenue in Texas.**
 - Retail electricity sales revenue in Texas was over \$20.4 billion in 2000.
 - Adjusting these sales revenues by the same growth rate used for the modeling of costs would result in revenues of almost \$31.4 billion annually in 2020.
- **Nationwide, the projected annual costs of Clear Skies (in \$1999) are \$4.3 billion in 2010 and \$6.3 billion in 2020; the nationwide benefits of Clear Skies are expected to be over \$113 billion annually by 2020.**
 - An alternate estimate projects annual health benefits totaling \$23 billion.

Note: Costs include capital costs, fuel, and other operation and maintenance costs (both fixed and variable) associated with the achievement of the emissions caps in the legislation (for example, the installation and operation of pollution controls). These state-level production costs are estimates; they do not account for the costs associated with the transfer of electricity across regions, nor the costs or savings that could be associated with allowance movement between sources.

Clear Skies....

- **Guarantees significant emissions reductions – beginning years before full implementation**
- **Uses a proven and flexible market-based approach with incentives for innovation**
- **Increases certainty across the board for industry, regulators, and consumers**

Notes on EPA's Analysis

- The information presented in this analysis reflects EPA's modeling of the Clear Skies Act of 2003.
 - EPA has updated this information to reflect modifications:
 - Changes included in the Clear Skies Act of 2003.
 - Revisions to the Base Case to reflect newly promulgated rules at the state and federal level since the initial analysis was undertaken.
 - The Clear Skies modeling results presented include the safety valve feature
- This analysis compares new programs to a Base Case (Existing Control Programs), which is typical when calculating costs and benefits of Agency rulemakings.
 - The Base Case reflects implementation of current control programs only:
 - Does not include yet-to-be developed regulations such as those to implement the National Ambient Air Quality Standards.
 - The EPA Base Case for power sector modeling includes:
 - Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in Connecticut, Massachusetts, Missouri, New Hampshire, North Carolina, Texas, and Wisconsin finalized before March 2003.
 - For air quality modeling, the Base Case also includes federal and state control programs, as well as the Tier II, Heavy Duty Diesel, and Non-Road Diesel rules.
- **For more information regarding the Clear Skies Act, please visit the EPA website:**

(<http://www.epa.gov/clearskies>)

