

US EPA ARCHIVE DOCUMENT



The Clear Skies Act of 2003

New Jersey and Clear Skies

Highlights of Clear Skies in New Jersey

- **New Jersey sources would reduce emissions of SO₂ by 62%, NO_x by 63%, and mercury by 78% due to Clear Skies.**
- **The health benefits in New Jersey would total \$3.2 billion (\$610 million under the alternative estimate) and include 400 fewer premature deaths (200 under the alternative estimate) and 700 fewer hospitalizations/emergency room visits for asthma.**
- **In addition, New Jersey would receive environmental benefits including reductions in sulfur, mercury and nitrogen deposition, and visibility improvements valued at \$96 million for New Jersey residents who visit National Parks nationwide.**
- **Clear Skies does not significantly impact electricity prices. With or without Clear Skies, electricity prices in the electricity supply region that includes New Jersey are expected to remain below 2000 prices.**

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

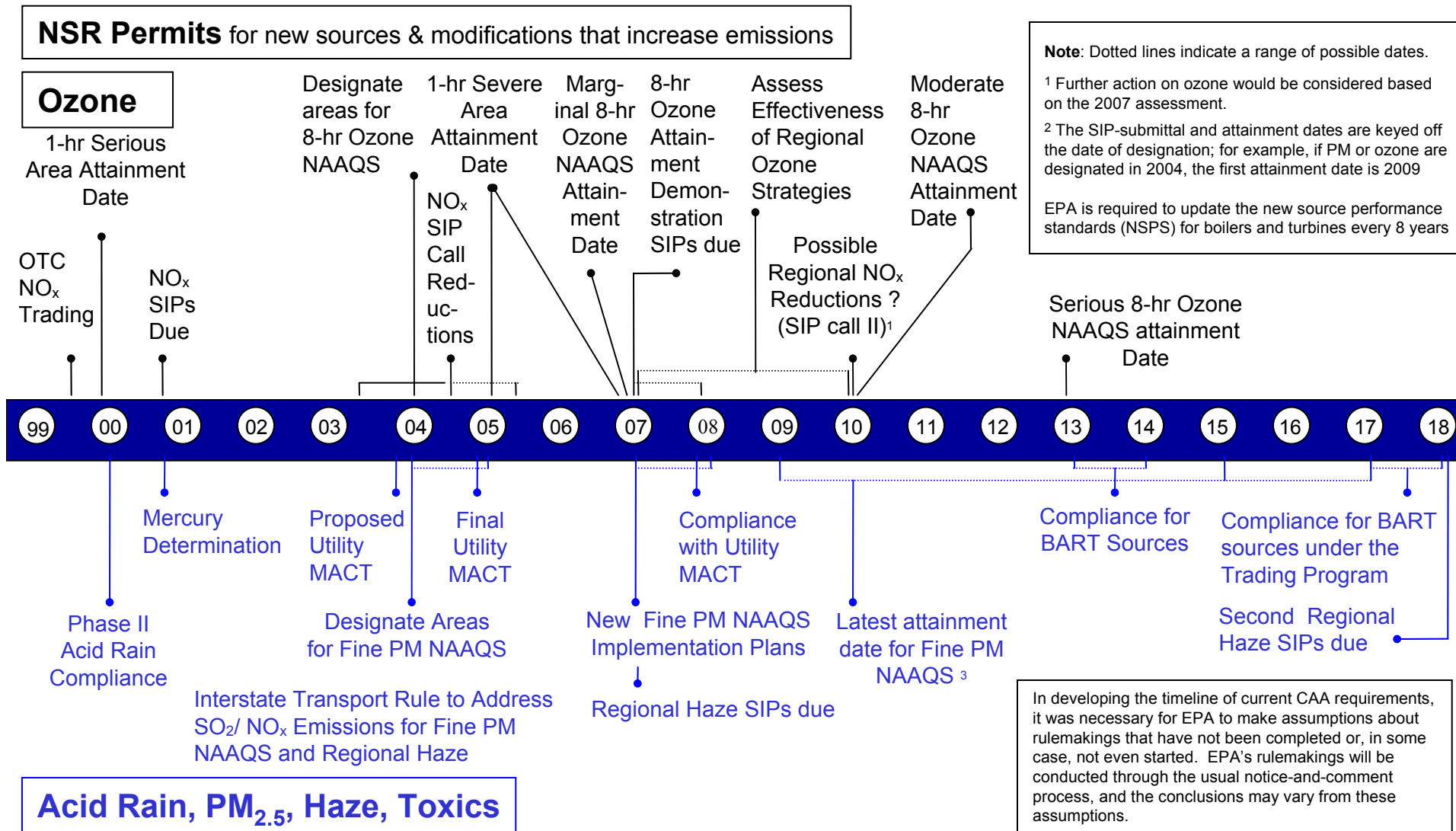
Why Clear Skies?

- **Air quality has improved, but serious concerns persist**
 - New Jersey's 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**
 - New Jersey 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)

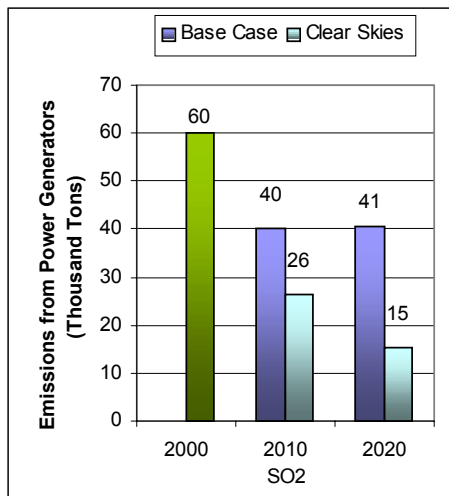
Emissions in New Jersey under Clear Skies

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

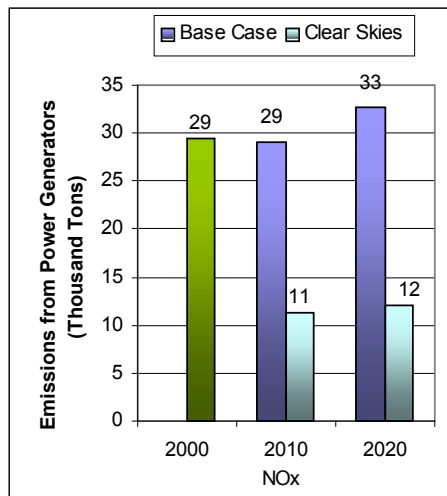
- 75% reduction in SO₂ emissions
- 59% reduction in NO_x emissions
- 77% decrease in mercury emissions compared to the base case

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

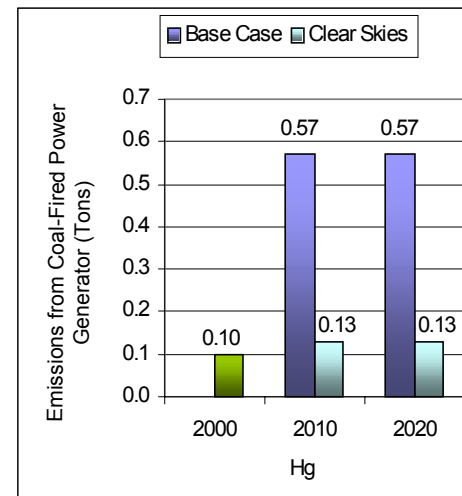
Sulfur dioxide



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.

Clear Skies Health Benefits in New Jersey

Improve Public Health

- **Reduced ozone and fine particle exposure** by 2020 would result in public health benefits of:
 - approximately 400 fewer premature deaths each year¹
 - approximately 300 fewer cases of chronic bronchitis each year
 - approximately 800 fewer non-fatal heart attacks each year
 - approximately 700 fewer hospital and emergency room visits each year
 - approximately 47,000 fewer days workers are out sick due to respiratory symptoms each year
 - approximately 5,500 fewer school absences each year
- **Reduced mercury emissions** would reduce exposure to mercury through consumption of contaminated fish, resulting in additional, unquantified benefits for those who eat fish from New Jersey's lakes and streams.

By 2020, New Jersey would receive approximately \$3.2 billion in annual health benefits from reductions in fine particle and ozone concentrations alone due to Clear Skies.¹

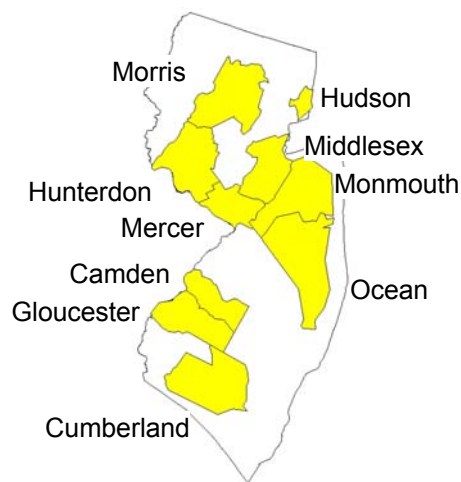
1. An alternative methodology for calculating health-related benefits projects approximately 200 premature deaths prevented and \$610 million in health benefits each year in New Jersey by 2020.

Counties Projected to Remain Out of Attainment with the PM_{2.5} and Ozone Standards in New Jersey

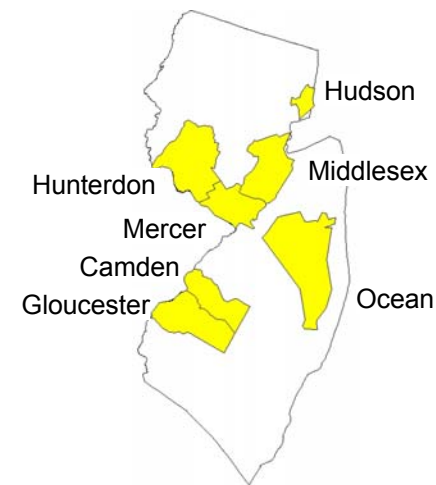
Current Conditions



2010 Base Case



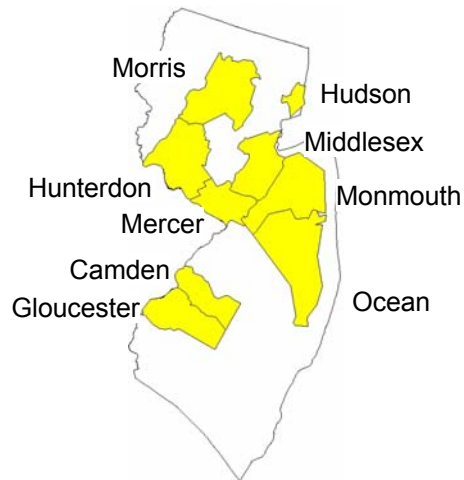
2020 Base Case



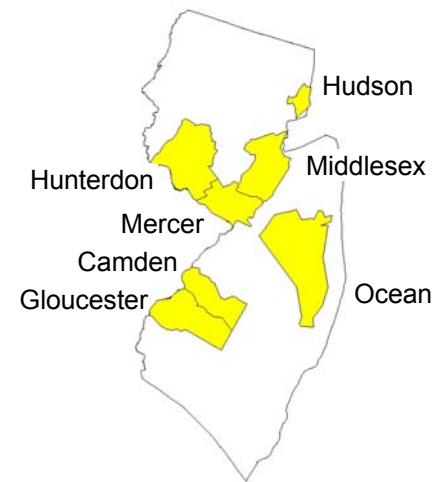
Legend

- out of attainment with the 8-hour ozone standard only
- out of attainment with the annual fine particle standards only
- out of attainment with both standards

2010 Clear Skies



2020 Clear Skies



Note: Based on 1999-2001 data of counties with monitors that have three years of complete data. The base case includes Title IV, the NO_x SIP Call, the Tier II, Heavy-Duty Diesel, and Nonroad Diesel rules, final NSR settlements as of early spring 2003, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act.

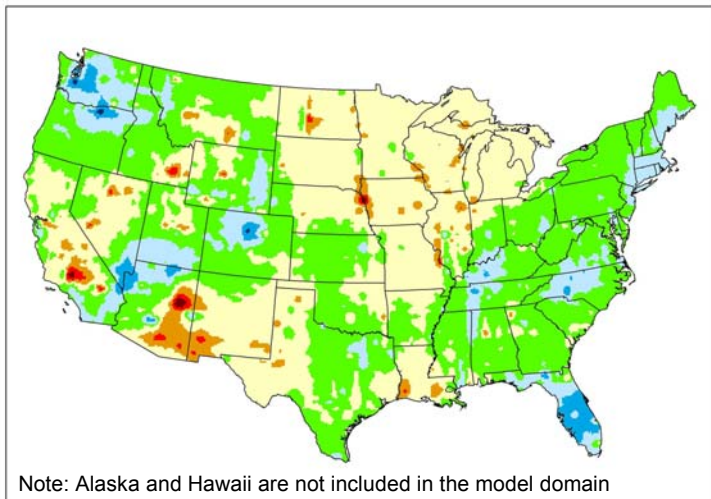
Clear Skies Would Help New Jersey Meet Air Quality Standards

- Currently there are 2 counties exceeding the annual fine particle standards and 12 counties exceeding the 8-hour ozone standard.
 - All of these counties are expected to be brought into attainment with the fine particle standards under existing programs.
 - Four of these counties are expected to be brought into attainment with the ozone standard under existing programs by 2020.
- **Clear Skies would significantly improve air quality in New Jersey** further and more quickly than what is expected from existing programs.
 - By 2010, Clear Skies would bring Cumberland County (population approximately 150,000) into attainment with the 8-hour ozone standard.
- In addition, Clear Skies would reduce ozone and fine particle concentrations in counties throughout the state and move the remaining ozone non-attainment counties in New Jersey (Hudson, Middlesex, Hunterdon, Mercer, Camden, Gloucester, and Ocean counties) closer to attainment.

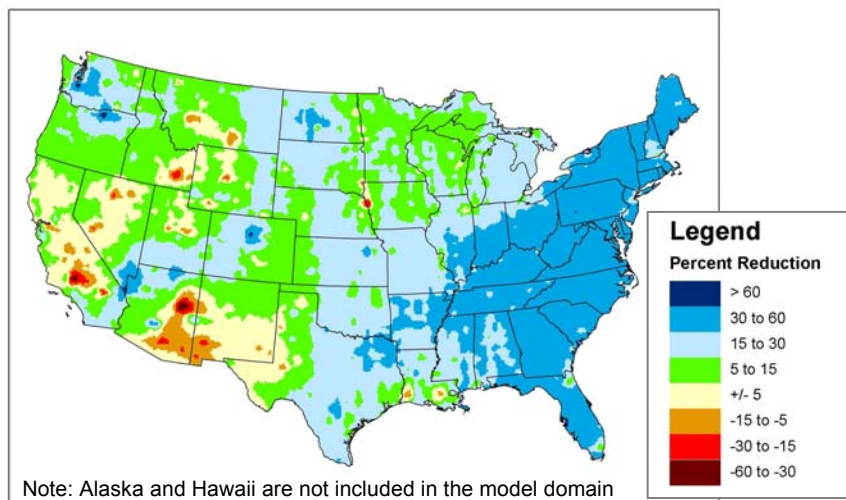
Note: Based on 1999-2001 data of counties with monitors that have three years of complete data.

Clear Skies Environmental Benefits in New Jersey

Projected Changes in Sulfur Deposition with the Base Case in 2020 Compared to 2001



Projected Changes in Sulfur Deposition with Clear Skies and the Base Case in 2020 Compared to 2001



Clear Skies Would Provide Substantial Environmental Benefits in New Jersey

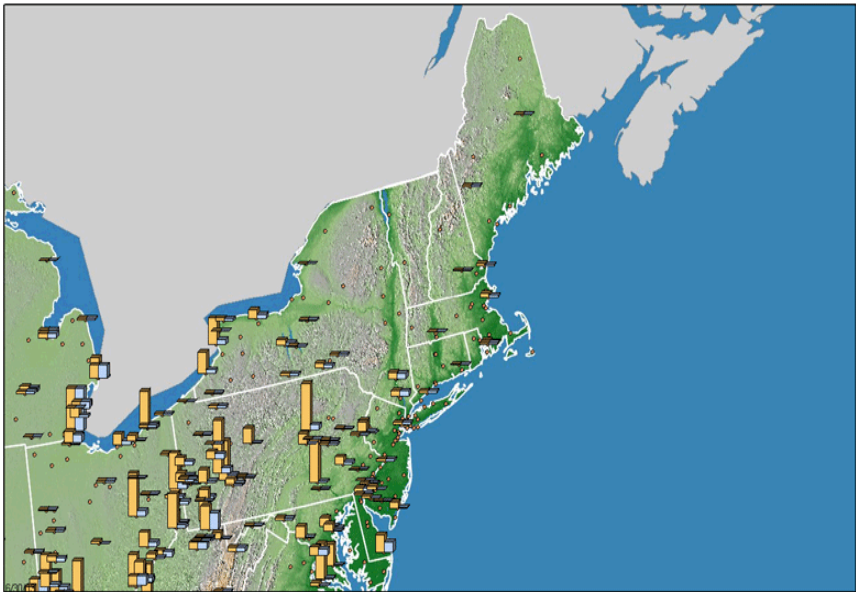
In comparison to existing programs,

- **Visibility would improve perceptibly.**
 - The value of this benefit for New Jersey is \$96 million.
- **Sulfur deposition, a primary cause of acid rain, would decrease by 15-30% across most of the state and 30-60% in the southernmost portion of the state.**
- **Nitrogen deposition, another significant contributor to acid rain as well as a cause of damage in nitrogen-sensitive forests and coastal waters, would decrease by up to 20%.**
- **Mercury deposition would decrease by 5-15% across of the state and by up to 30% in some areas.***

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

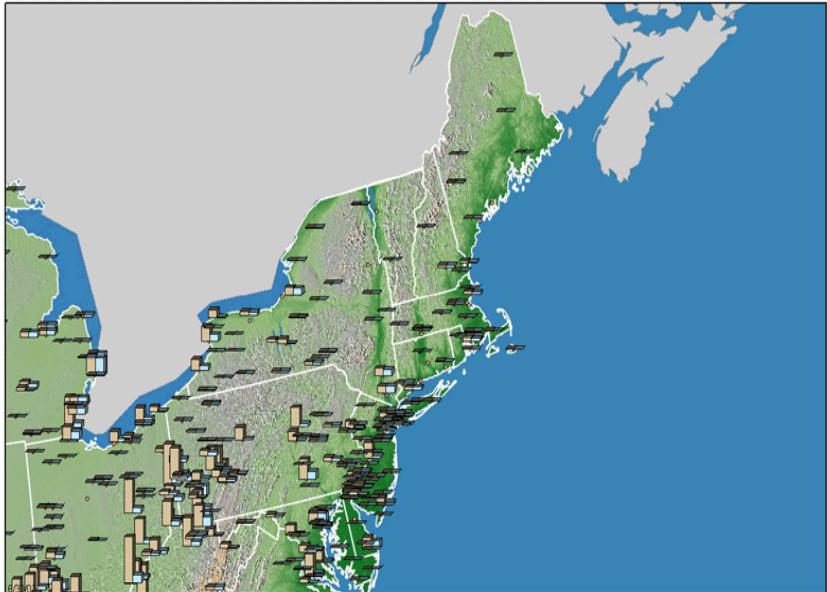
SO₂ and NO_x Emissions Reductions under Clear Skies

Emissions in states surrounding New Jersey would decrease considerably. These emission reductions would make it much easier for New Jersey to comply with the national air quality standards.



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

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



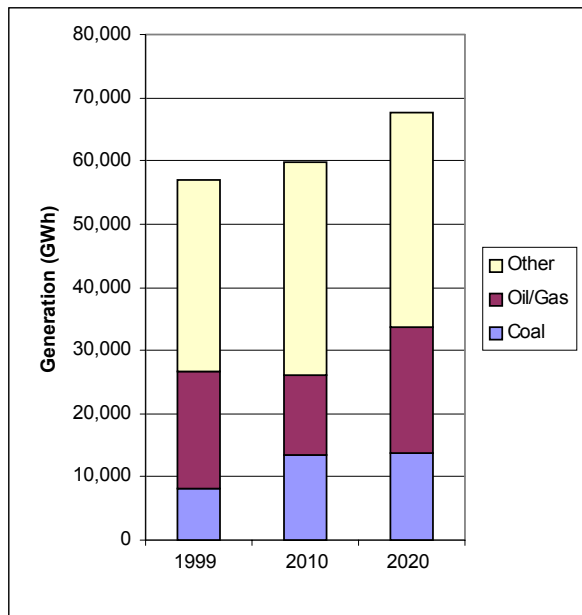
Projected NO_x Emissions from Power Plants with the Base Case and Clear Skies (2020)
 Northeast

- 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 in 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. Emissions projected for new units in 2020 are not reflected.

Electricity Generation in New Jersey under Clear Skies

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

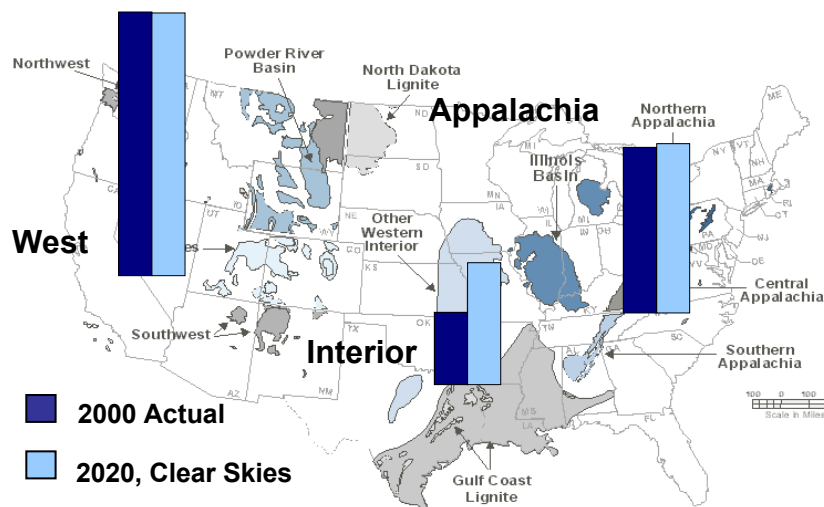


- **New Jersey's sources are projected to reduce their emissions through the installation of emission controls, rather than through a switch from coal to natural gas.**
 - In 2010, 78% of New Jersey's coal-fired generation is projected to come from units with advanced SO₂, NO_x and/or mercury control equipment; in 2020, the percentage is projected to increase to 93%.

- **New Jersey's electricity growth is projected to be met by increases in gas-fired and coal-fired generation. Clear Skies does not significantly alter this projection.**

- Electricity from coal-fired generation will increase by 71% from 1999 to 2020.

Current and Projected Coal Production for Electricity Generation



Scale: Appalachia 2000 = 299 million tons

Emission Controls in New Jersey under Clear Skies

• Under Clear Skies by 2020...

- 9% of coal-fired capacity would install SCR
- 19% would install scrubbers
- 63% would install mercury controls

• The major generation companies in New Jersey include:

- Public Service Electric & Gas Co.
- Atlantic City Electric Company
- Reliant Energy

• Total coal-fired capacity in New Jersey is projected to be 1,864 MW in 2010

Units in New Jersey Projected to Be Retrofitted Due to Clear Skies by 2020

Plant Name	Unit ID	Technology
Chambers Cogeneration Limited Partnership	GEN1	Scrubber/ SCR
Logan Generating Plant	GEN1	Scrubber
HUDSON	2	ACI*
MERCER	1	ACI*
MERCER	2	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.

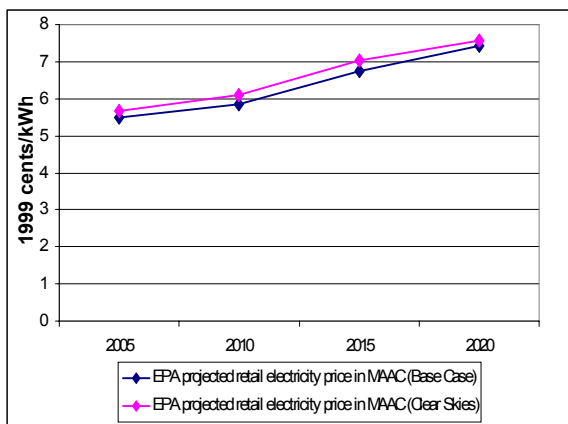
[2] BL England unit 1 is projected to be removed from operation by 2005 with Clear Skies due to excess gas-fired capacity in the marketplace, unless otherwise needed for voltage purposes. The recent overbuild of gas-fired generation reduces the need for less efficient units operating at lower capacity 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 New Jersey under Clear Skies

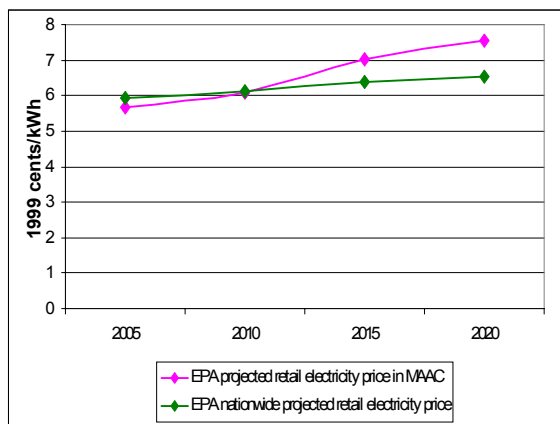
- With or without Clear Skies, retail prices in the North American Electric Reliability Council (NERC) MAAC region (the electricity supply region that contains New Jersey) are projected to increase between 2005 and 2020.
- With Clear Skies, retail prices are projected to be approximately 2.1 – 4.2% higher between 2005 and 2020 than in the absence of the legislation.



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



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



In 2000, the average retail electricity price in New Jersey was approximately 9.1 cents/kWh, which was above 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 New Jersey under Clear Skies

Benefits Outweigh the Costs

- **In New Jersey, Clear Skies is projected to cost approximately \$26 million annually by 2020 while providing health benefits totaling approximately \$3.2 billion annually.**
- **The increases in production costs under Clear Skies represent only a small percentage of total retail electricity sales revenue in New Jersey.**
 - Retail electricity sales revenue in New Jersey was almost \$6.4 billion in 2000.
 - Adjusting these sales revenues by the same growth rate used for the modeling of costs would result in revenues of over \$9.9 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.

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**

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.

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 New York, 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>)

