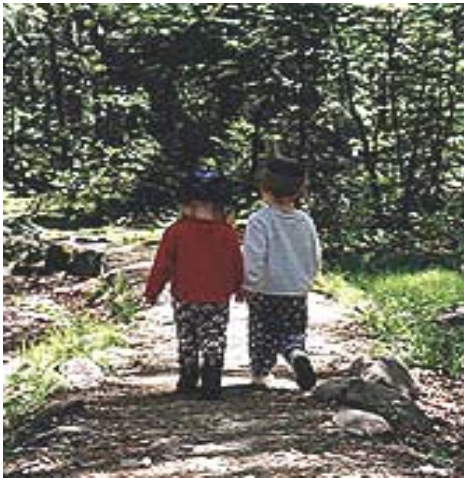


US EPA ARCHIVE DOCUMENT



# The Clear Skies Act of 2003

New Hampshire and Clear Skies

## Highlights of Clear Skies in New Hampshire

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- New Hampshire already has in place state requirements that will substantially reduce emissions of SO<sub>2</sub> and NO<sub>x</sub> in the State.
- Clear Skies achieves additional emission reductions in New Hampshire; New Hampshire sources would reduce emissions of SO<sub>2</sub> by 45%, NO<sub>x</sub> by 21%, and mercury by 20% by 2020 due to Clear Skies.
- The health benefits in New Hampshire would total \$290 million annually (\$55 million under the alternative estimate) and include for the New England region approximately 500 fewer premature deaths (290 under the alternative estimate) and 860 fewer hospitalizations/emergency room visits each year.
- In addition, New Hampshire would receive environmental benefits, including improved visibility and reduced acidic deposition.
- Clear Skies does not significantly impact electricity prices. With or without Clear Skies, electricity prices in the electricity supply region that includes New Hampshire are expected to remain below 2000 prices.

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

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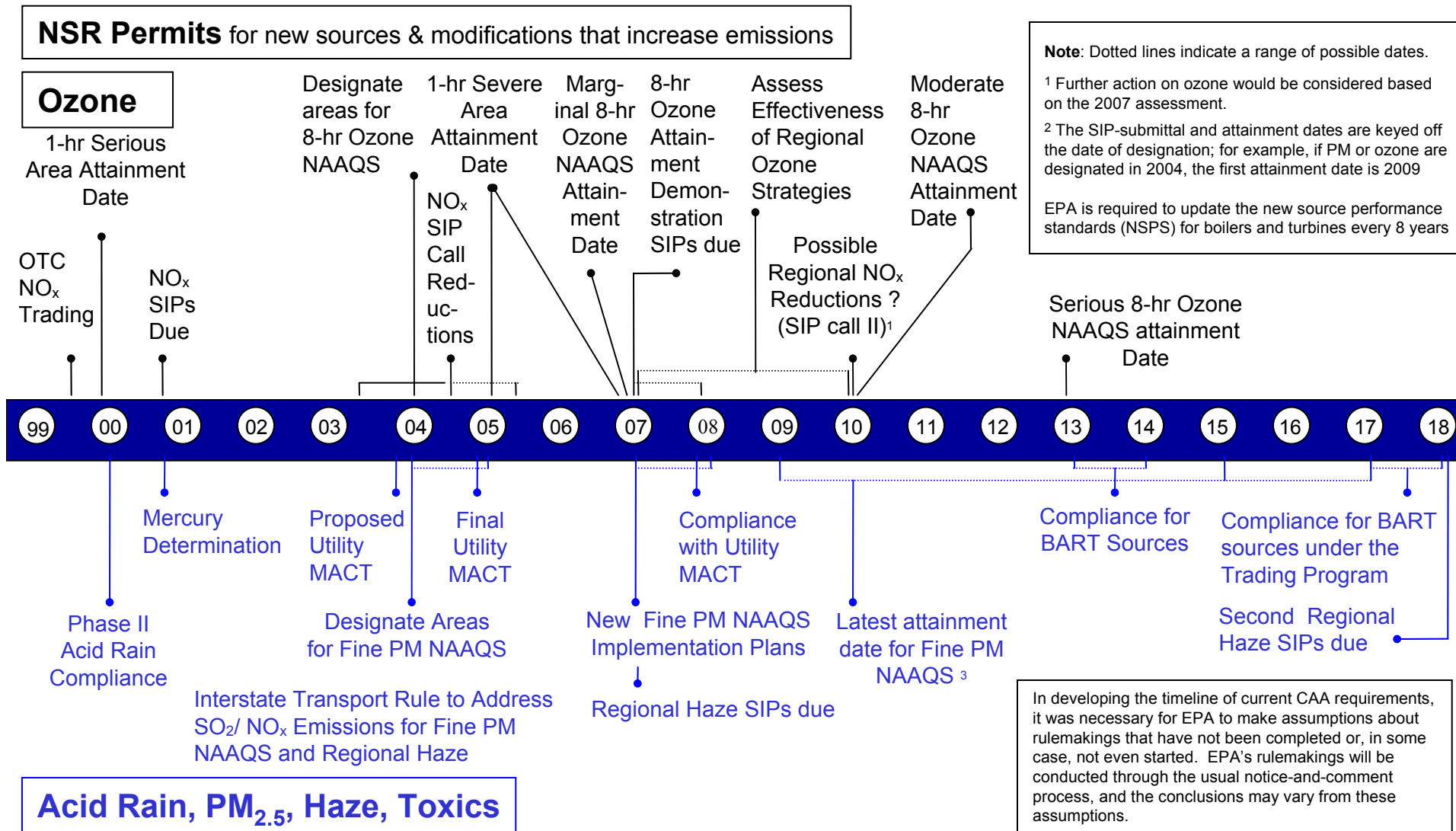
## Why Clear Skies?

- **Air quality has improved, but serious concerns persist**
  - New Hampshire'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 Hampshire sources would substantially reduce emissions of SO<sub>2</sub> and NO<sub>x</sub>
  - 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<sub>x</sub> SIP call (summertime NO<sub>x</sub> cap in 19 Eastern States + D.C.)**

**2004**

The existing Title IV SO<sub>2</sub> 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<sub>x</sub> 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: SO<sub>2</sub> Phase I (4.5 million ton annual cap with a national trading program)**

**2018: Clear Skies NO<sub>x</sub> 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 SO<sub>2</sub> Phase II (3.0 million ton annual cap with a national trading program)**

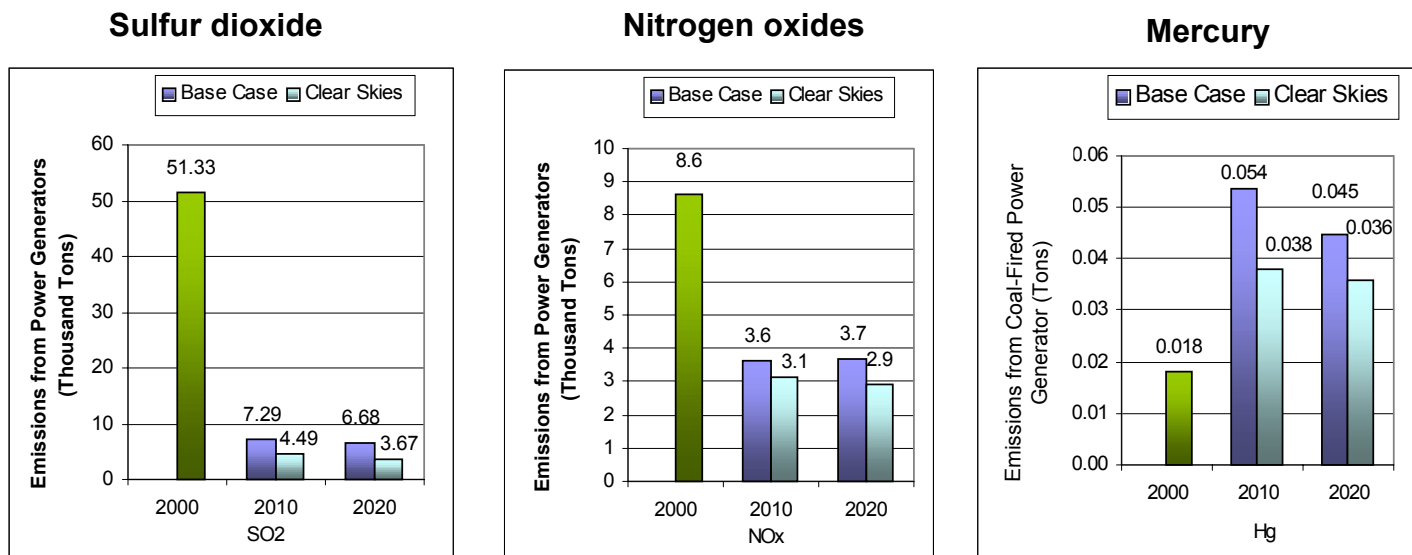
# Emissions in New Hampshire under Clear Skies

**Emissions in New Hampshire (2020) would be significantly reduced:**

- 93% reduction in SO<sub>2</sub> emissions from 2000 levels
- 66% reduction in NO<sub>x</sub> emissions from 2000 levels
- 20% decrease in mercury emissions from the base case

**These NO<sub>x</sub> and SO<sub>2</sub> reductions are mostly attributable to the state regulation.**

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



Note: The base case in IPM includes Title IV, the NO<sub>x</sub> 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 and Air Quality Benefits in New Hampshire

## Improve Public Health

- Throughout the New England region, **reduced ozone and fine particle exposure** by 2020 would result in public health benefits of:
  - approximately 500 fewer premature deaths each year<sup>1</sup>
  - approximately 320 fewer cases of chronic bronchitis each year
  - approximately 1,100 fewer non-fatal heart attacks each year
  - approximately 860 fewer hospital and emergency room visits each year
  - approximately 57,000 fewer days workers are out sick due to respiratory symptoms each year
  - approximately 4,600 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 New Hampshire's lakes and streams.

**By 2020, New Hampshire would receive approximately \$290 million in annual health benefits from reductions in fine particle and ozone concentrations alone due to Clear Skies.<sup>1</sup>**

## Help Maintain Health-Based Air Quality Standards<sup>2</sup>

- All counties in New Hampshire currently meet the 8-hour ozone and fine particle standards.
- Clear Skies would further reduce concentrations of ozone and fine particles throughout New Hampshire.

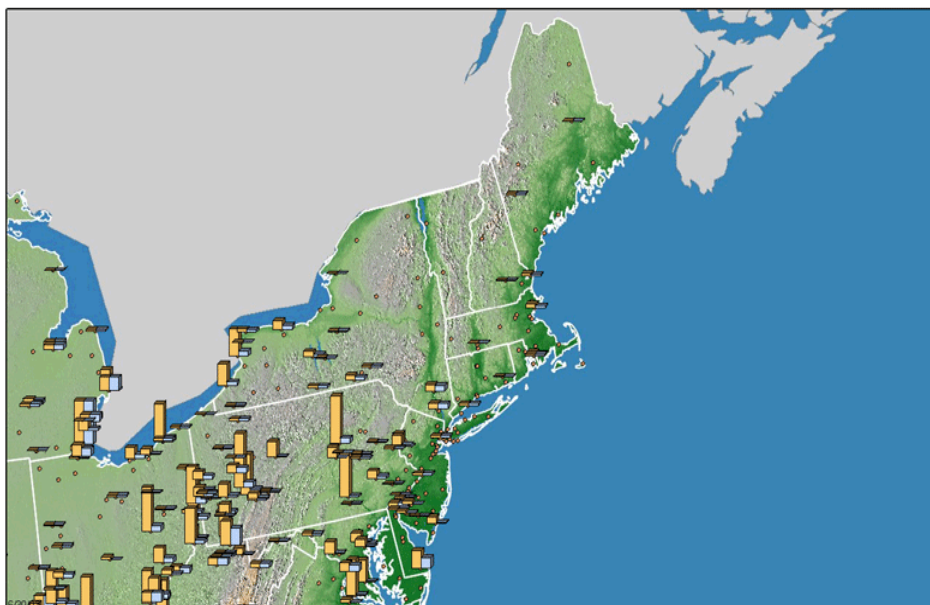
1. An alternative methodology for calculating health-related benefits projects approximately 290 premature deaths prevented throughout New England and \$55 million in health benefits in New Hampshire each year by 2020.

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



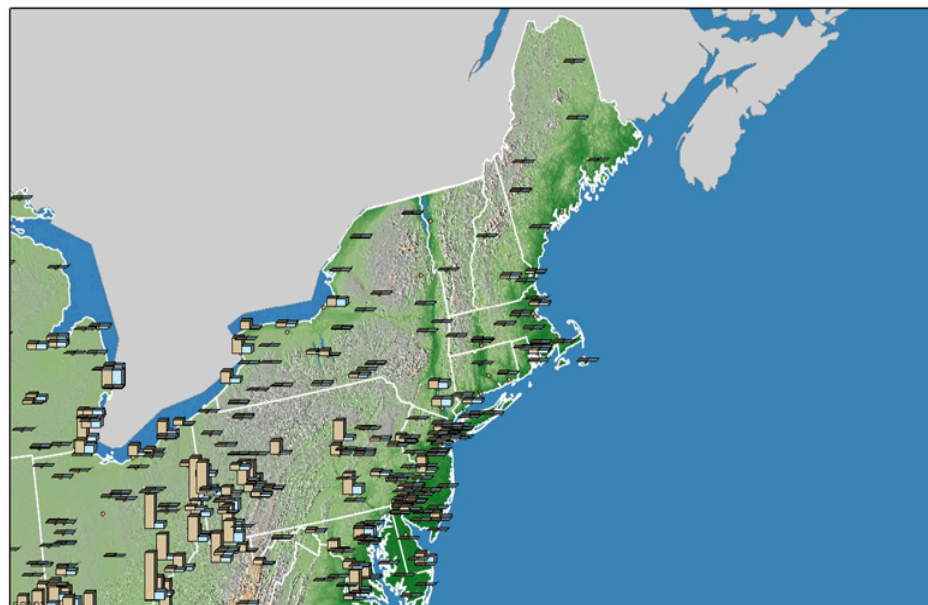
# Emission Reductions under Clear Skies

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



Projected SO<sub>2</sub> Emissions from Power Plants with the Base Case and Clear Skies (2020)  
Northeast

- 75,000 tons
- Base Case Power Plant SO<sub>2</sub>
- Clear Skies Power Plant SO<sub>2</sub>
- Fossil Power Plants with Negligible SO<sub>2</sub> Emissions



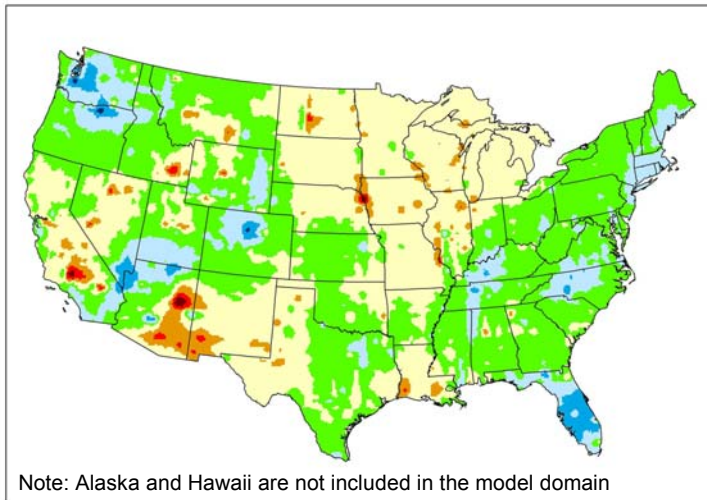
Projected NO<sub>x</sub> Emissions from Power Plants with the Base Case and Clear Skies (2020)  
Northeast

- 22,000 tons
- Base Case Power Plant NO<sub>x</sub>
- Clear Skies Power Plant NO<sub>x</sub>
- Fossil Power Plants with Negligible NO<sub>x</sub> Emissions

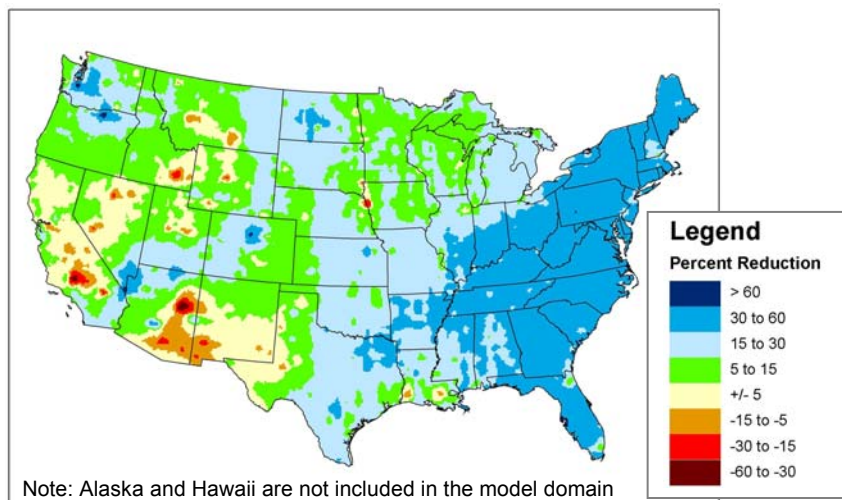
Note: The base case in IPM includes Title IV, the NO<sub>x</sub> SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts 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.

# Clear Skies Environmental Benefits in New Hampshire

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 Hampshire

In comparison to existing programs,

- **Visibility would improve** perceptibly in much of the state, including the White Mountain National Forest region.
  - The value of improved visibility for New Hampshire residents who visit National Parks and Wilderness areas nationwide would be \$13 million each year by 2020.
- **Sulfur deposition, a primary cause of acid rain, would decrease** by 15-30% across most 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% throughout New Hampshire.
- **Mercury deposition would decrease** by up to 5% across the state.\*

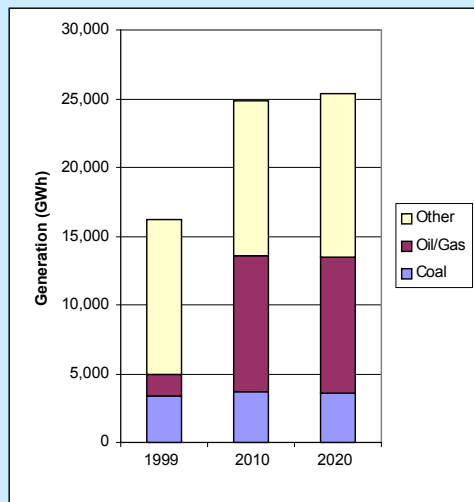
\* These results are based on modeling the Clear Skies mercury cap without triggering the safety valve.

# Electricity Generation and Pollution Controls in New Hampshire under Clear Skies

- New Hampshire'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 7% from 1999 to 2020.

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



- New Hampshire's sources are projected to reduce their emissions through the use of existing pollution controls, rather than through a switch from coal to natural gas.
  - In 2010 and 2020, 100% of New Hampshire's coal-fired generation is projected to come from units with advanced SO<sub>2</sub> and/or NO<sub>x</sub> control equipment that also substantially reduce mercury emissions.
  - No pollution controls are projected to be installed in New Hampshire under Clear Skies.

- The major generation companies in New Hampshire include:

- Public Service Company of NH

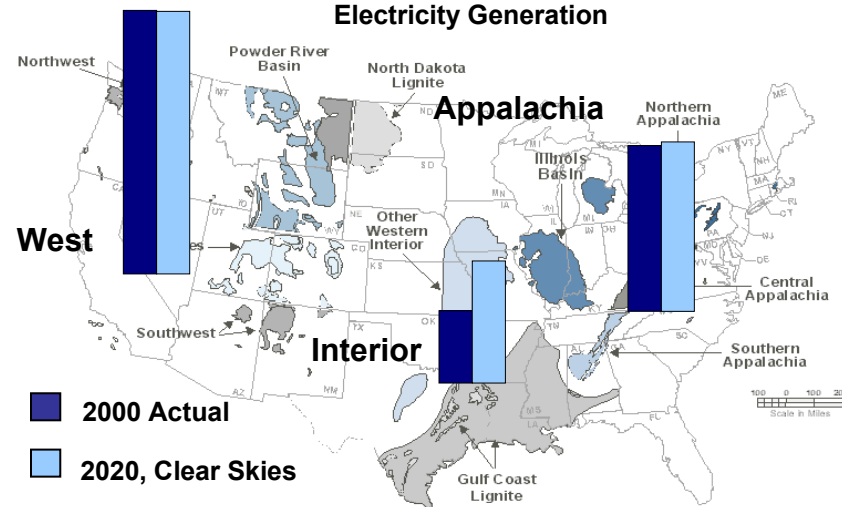
- Total coal-fired capacity in New Hampshire is projected to be 521 MW in 2010

Notes:

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

[2] Schiller unit 6 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.

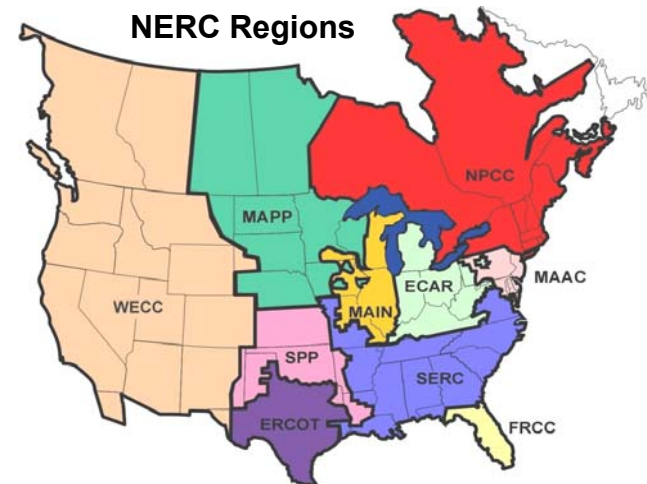
Current and Projected Coal Production for Electricity Generation



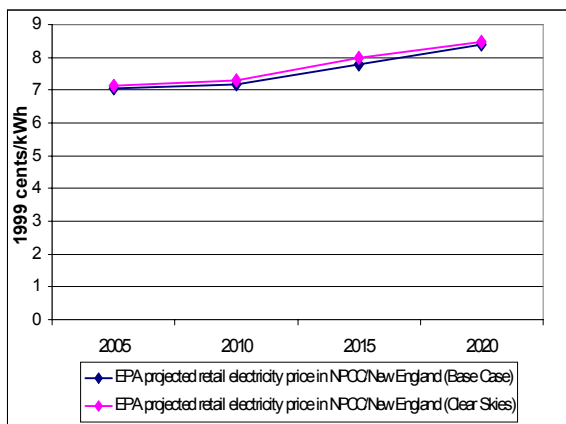
Scale: Appalachia 2000 = 299 million tons

# Electricity Prices in New Hampshire under Clear Skies

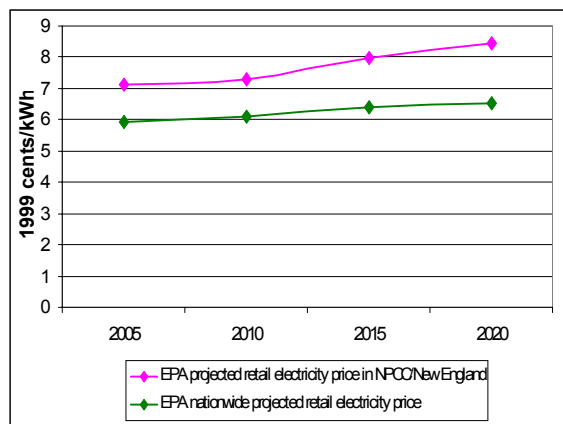
- With or without Clear Skies, retail prices in the North American Electric Reliability Council (NERC) NPCC region (the electricity supply region that contains New Hampshire) are projected to increase between 2005 and 2020.
- With Clear Skies, retail prices are projected to be approximately 0.5 – 2.7% higher between 2005 and 2020 than in the absence of the legislation.



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



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



In 2000, the average retail electricity price in New Hampshire was approximately 11.6 cents/kWh, which was above the average *national* retail price of approximately 6.66 cents/kWh.

Note: The base case using IPM includes Title IV, the NO<sub>x</sub> 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 Hampshire under Clear Skies

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## Benefits Outweigh the Costs

- In New Hampshire, economic modeling projects that the cost of generating electricity, of which a component is the cost of installing and operating pollution controls, is less under Clear Skies than under the base case as power production shifts within the region to enable the power sector to comply in the most cost-effective manner. Total annual health benefits in 2020 for New Hampshire are projected to be \$290 million.
- 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

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- 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<sub>x</sub> SIP Call, NSR settlements, and state-specific caps in New Hampshire, 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>)

