

US EPA ARCHIVE DOCUMENT



The Clear Skies Act of 2003

Vermont and Clear Skies



Highlights of Clear Skies in Vermont

- Vermont sources would emit no SO₂, NO_x, or mercury by 2020.
- The health benefits in Vermont would total \$170 million. In the broader New England region, benefits would be approximately 500 fewer premature deaths (290 under the alternative estimate) and 860 fewer hospitalizations/emergency room visits each year.
- In addition, Vermont would receive environmental benefits, including reduced sulfur and nitrogen deposition and improved visibility for Vermont residents who visit National Parks and Wilderness Areas nationwide valued at \$5 million each year by 2020.
- Clear Skies does not significantly impact electricity prices. With or without Clear Skies, electricity prices in the electricity supply region that includes Vermont are expected to remain below 2000 prices.

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

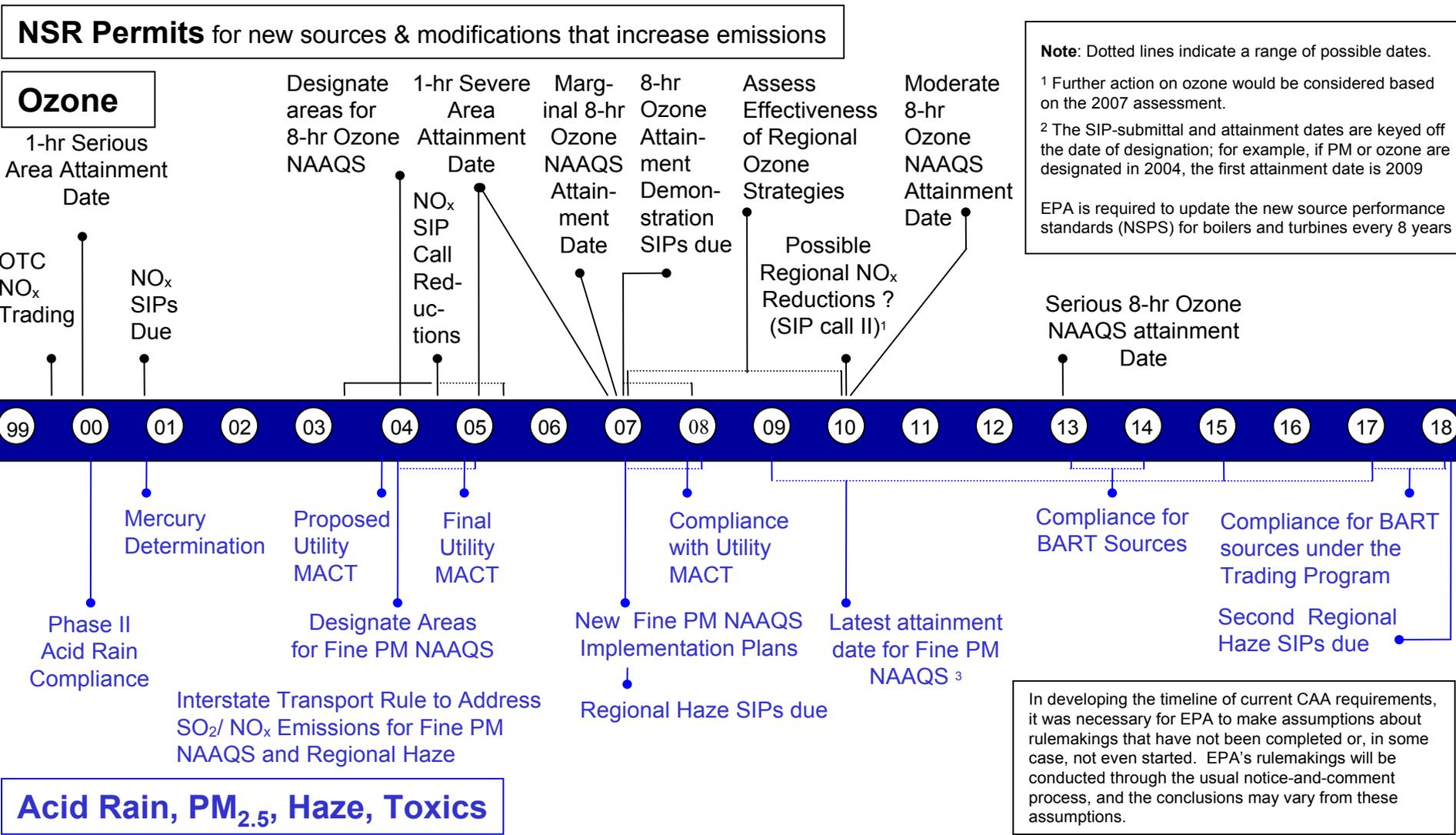
Why Clear Skies?

- **Air quality has improved, but serious concerns persist**
 - Vermont'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**
 - Vermont would benefit from regional reductions of SO₂, NO_x and mercury emissions
 - Delivers dramatic progress towards achievement of regional 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 Vermont under Clear Skies

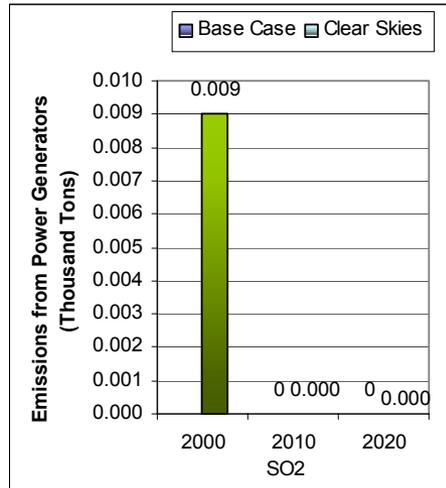
Emissions in Vermont (2020):

- No SO₂ emissions
- No NO_x emissions
- No mercury emissions

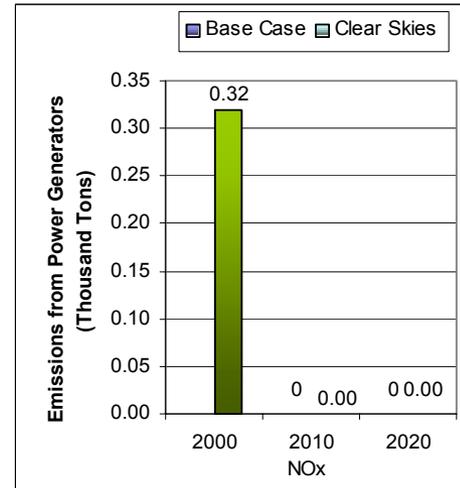
There are no coal-fired power plants in Vermont

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

Sulfur dioxide



Nitrogen oxides



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 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 Vermont

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 year¹
 - 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 Vermont's lakes and streams.

By 2020, Vermont would receive approximately \$170 million 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

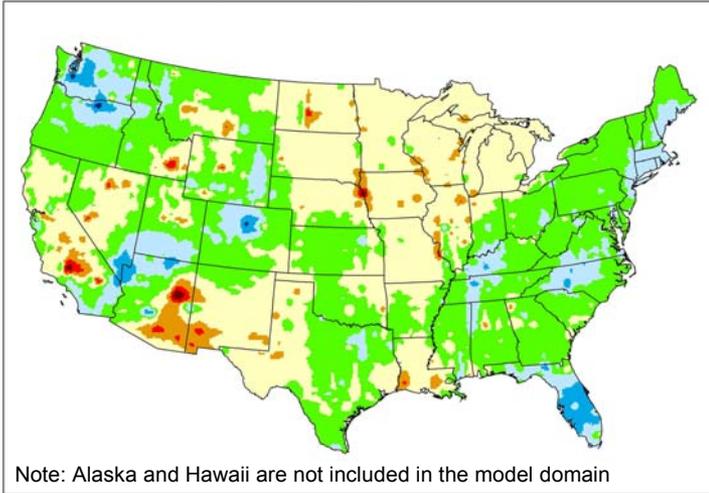
- All counties in Vermont currently meet the 8-hour ozone and fine particle standards.
- Clear Skies would further reduce concentrations of ozone and fine particles throughout Vermont.

1. An alternative methodology for calculating health-related benefits projects approximately 290 premature deaths prevented throughout New England and \$32 million in health benefits in Vermont each year by 2020.

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

Clear Skies Environmental Benefits in Vermont

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

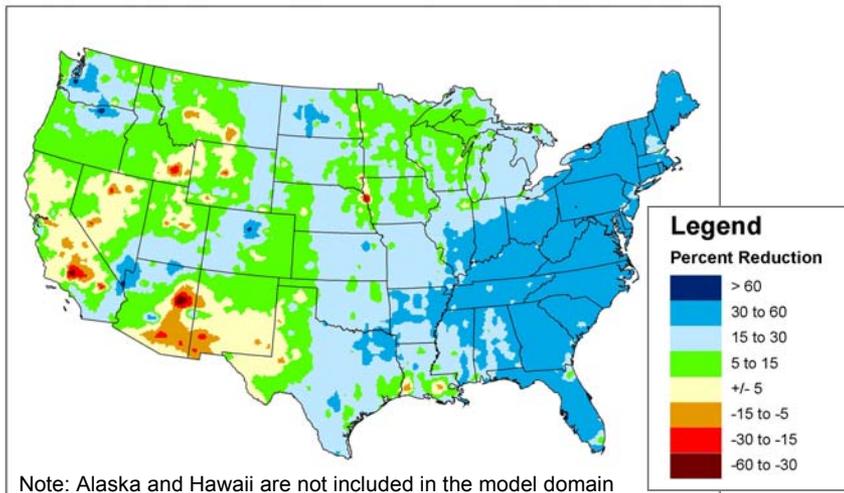


Clear Skies Would Provide Substantial Environmental Benefits in Vermont

In comparison to existing programs,

- **Visibility would improve** perceptibly in much of the state.
 - The value of improved visibility for Vermont residents who visit National Parks and Wilderness areas nationwide would be \$5 million each year by 2020.
- **Sulfur deposition, a primary cause of acid rain, would decrease** by 15-30% across the state.
- **Nitrogen deposition, another significant contributor to acid rain as well as a cause of damage in nitrogen-sensitive forests, would decrease** by up to 20% throughout Vermont.
- **Mercury deposition would decrease** by up to 5% across the state.*

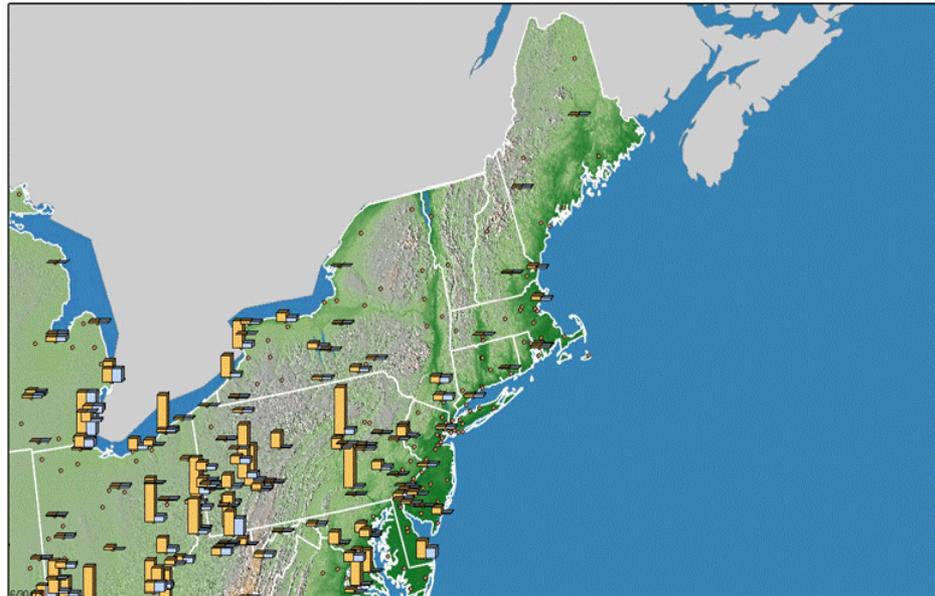
Projected Changes in Sulfur Deposition with Clear Skies and the Base Case in 2020 Compared to 2001



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

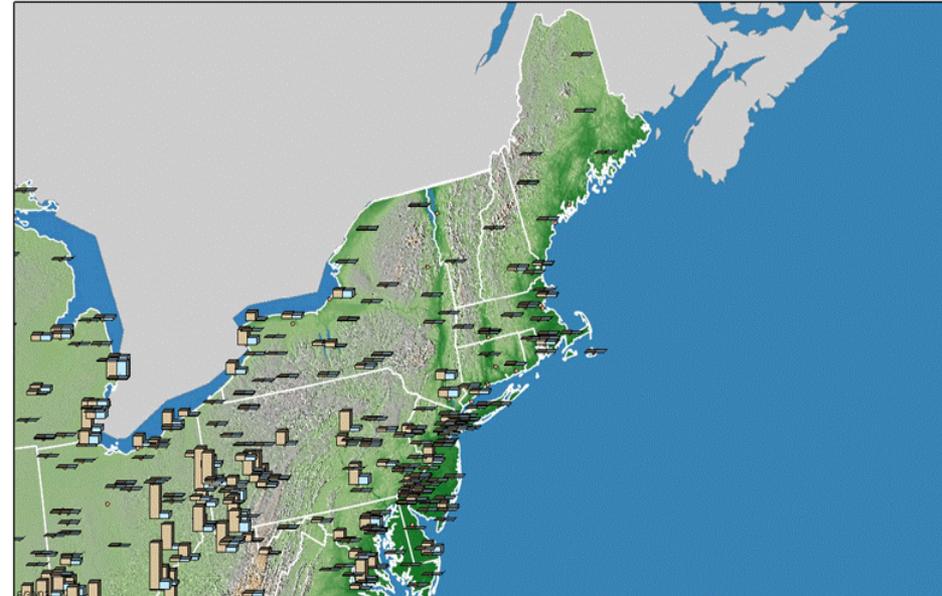
Emission Reductions under Clear Skies

Emissions in states surrounding Vermont would decrease considerably. These emission reductions would make it much easier for Vermont 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



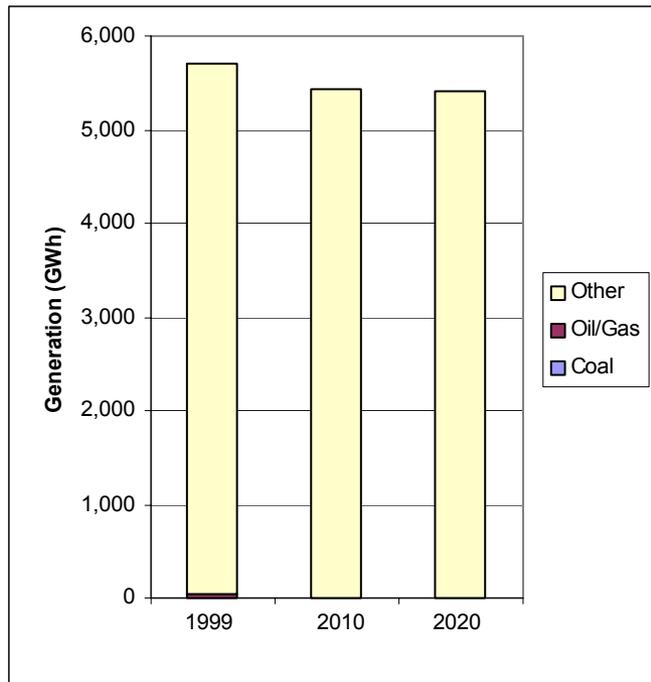
Projected NO_x Emissions from Power Plants with the Base Case and Clear Skies (2020)
Northeast

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 Vermont under Clear Skies

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

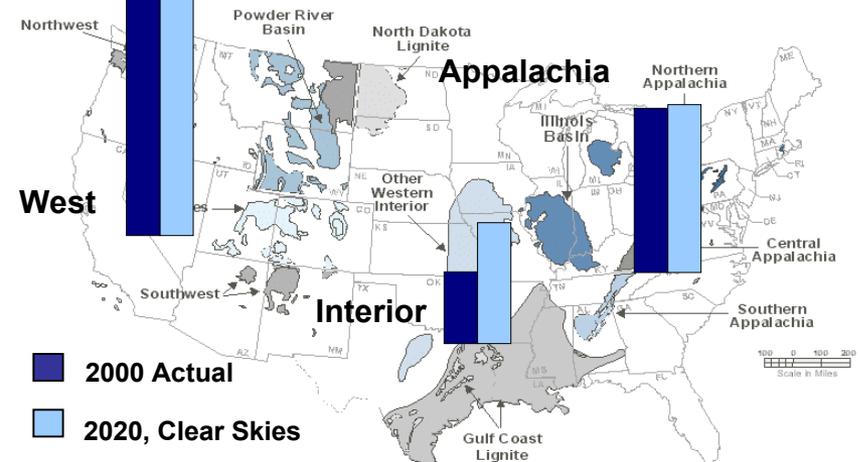


• The major generation companies in Vermont include:

- City of Burlington
- Green Mountain Power Corporation
- Tractebel Power Inc.

• There are currently no coal-fired power plants in Vermont.

Current and Projected Coal Production for Electricity Generation



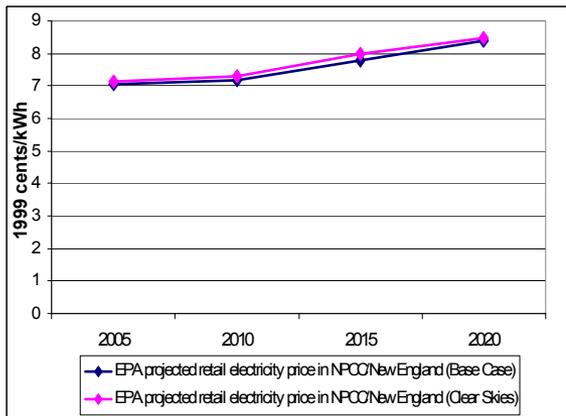
Scale: Appalachia 2000 = 299 million tons

Electricity Prices in Vermont under Clear Skies

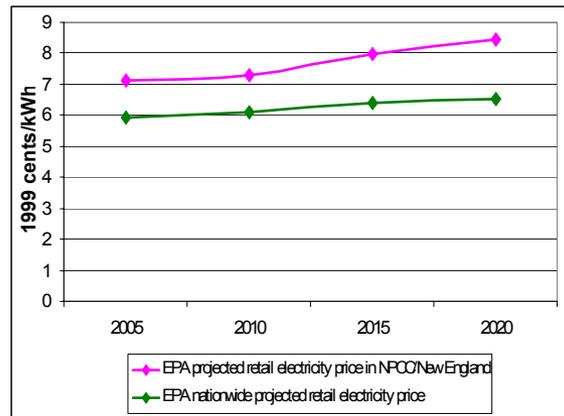
- With or without Clear Skies, retail prices in the North American Electric Reliability Council (NERC) NPCC region (the electricity supply region that contains Vermont) are projected to increase between 2005 and 2020.
- With Clear Skies, retail prices are projected to be approximately 0.5 – 2.7% higher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



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



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



In 2000, the average retail electricity price in Vermont was approximately 10.2 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 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 Vermont under Clear Skies

Benefits Outweigh the Costs

- **In Vermont, Clear Skies is projected to cost less than \$1 million annually by 2020 while providing health benefits totaling approximately \$170 million annually.**
- **The increases in production costs under Clear Skies represent only a small percentage of total retail electricity sales revenue in Vermont.**
 - Retail electricity sales revenue in Vermont was almost \$600 million in 2000.
 - Adjusting these sales revenues by the same growth rate used for the modeling of costs would result in revenues of almost \$900 million 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 Vermont, Massachusetts, Missouri, Vermont, 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>)

