The information presented here reflects EPA's modeling of the Clear Skies Act of 2002. The Agency is in the process of updating this information to reflect modifications included in the Clear Skies Act of 2003. The revised information will be posted on the Agency's Clear Skies Web site (www.epa.gov/clearskies) as soon as possible.

## CLEAR SKIES IN NORTH DAKOTA [1]

**Human Health and Environmental Benefits of Clear Skies:** Clear Skies would protect human health, improve air quality, and reduce deposition of sulfur dioxide ($SO_2$), nitrogen oxides ($NO_x$), and mercury.[2]

### Clear Skies Benefits Nationwide

- In 2020, annual health benefits from reductions in ozone and fine particles would total $93 billion, including 12,000 fewer premature deaths, far outweighing the $6.49 billion cost of the Clear Skies program.
- Using an alternative methodology results in over 7,000 premature deaths prevented and $11 billion in benefits by 2020—still exceeding the cost of the program.[3]
- Clear Skies would provide an additional $3 billion in benefits due to improved visibility in National Parks and wilderness areas in 2020.

- There are no counties in North Dakota currently projected to be out of attainment with the annual fine particle or 8-hour ozone standards. Clear Skies would, however, achieve additional reductions in fine particles and ozone that would further protect human health.

- Clear Skies delivers numerous environmental benefits by 2020:
  - visibility would improve up to 1 deciview throughout most of the state (a change of 1 deciview is a perceptible change in visibility);
  - sulfur deposition would decrease by up to 15% throughout most of the state; and
  - nitrogen deposition would be reduced by up to 30% in central portions of state and by up to 15% throughout the rest of the state.

[1] The projected impacts are the results of extensive emissions and regional air quality modeling and benefits analyses as summarized in the *Technical Addendum: Methodologies for Benefit Analysis of the Clear Skies Initiative, 2002*. While the policy analyses tools EPA used are among the best available, all such national scale policy assessments are subject to a number of uncertainties, particularly when projecting air quality or environmental impacts in particular locations.

[2] All human health and environmental benefits are calculated in comparison to existing Clean Air Act programs.

[3] The two sets of estimates reflect alternative assumptions and analytical approaches regarding quantifying and evaluating the effects of airborne particles on public health. All estimates assume that particles are causally associated with health effects, and that all components have the same toxicity. Linear concentration-response relationships between PM and all health effects are assumed, indicating that reductions in PM have the same impact on health outcomes regardless of the absolute level of PM in a given location. The base estimate relies on estimates of the potential cumulative effect of long-term exposure to particles, while the alternative estimate presumes that PM effects are limited to those that accumulate over much shorter time periods. All such estimates are subject to a number of assumptions and uncertainties. It is of note that, based on recent preliminary findings from the Health Effects Institute, the magnitude of mortality from short-term exposure (alternative estimates) and hospital/ER admissions estimates (both estimates) may be overstated. The alternatives also use different approaches to value health effects damages. The key assumptions, uncertainties, and valuation methodologies underlying the approaches used to produce these results are detailed in the *Technical Addendum* noted above.

**Changes in Emissions Under Clear Skies:** Clear Skies is projected to result in significant emissions reductions from power generators by 2020:

- In North Dakota, Clear Skies is projected to significantly reduce emissions from power generators by 2020 (relative to 2000 emissions):
  - $SO_2$ emissions would be reduced by 59%;
  - $NO_x$ emissions would be reduced by 56%; and
  - mercury emissions would be reduced by 79%.

**Nationwide Emissions under Clear Skies in 2020**

- $SO_2$ emissions from power generators are projected to be 3.9 million tons (a 65% reduction from 2000 levels).
- $NO_x$ emissions are projected to be 1.7 million tons (a 67% reduction from 2000 levels).
- Mercury emissions are projected to be 18 tons (a 63% reduction from 2000 levels).
- At full implementation, the emission reductions would be 73% for $SO_2$, 67% for $NO_x$, and 69% for mercury.

***Figures 1a, 1b and 1c.*** *Existing Clean Air Act Regulations (base case[4]) vs. Clear Skies in North Dakota in 2010 and 2020*

***Figure 1a. $SO_2$***

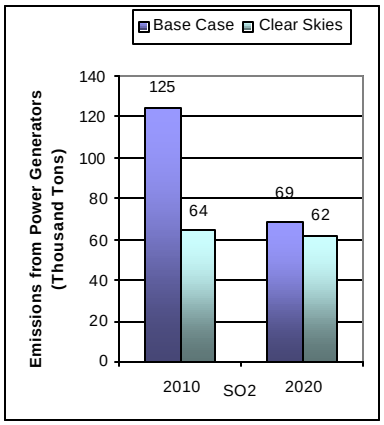



***Figure 1b. $NO_x$***

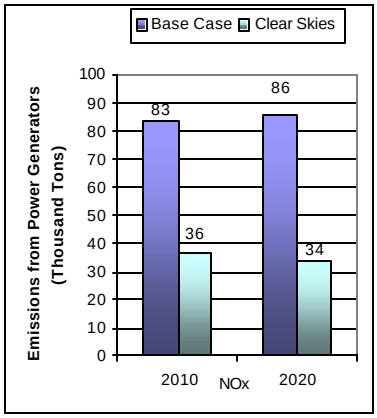
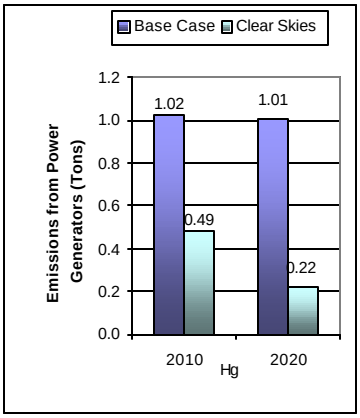



***Figure 1c. Mercury***




- Emissions rates in North Dakota in 2010 and 2020:

***Table 1.*** *Projected Emissions Rates in 2010 and 2020 in North Dakota From Power Generators*

| Year | | $SO_2$ | $NO_x$ | | | Hg |
|---|---|---|---|---|---|---|
| | | Coal | All | Coal | Gas | Coal |
| | | lbs/MMBtu | lbs/MMBtu | lbs/MMBtu | lbs/MMBtu | lbs/TBtu |
| 2010 | Base Case | 0.87 | 0.57 | 0.58 | 0.10 | 7.13 |
| | Clear Skies | 0.45 | 0.24 | 0.25 | 0.03 | 3.40 |
| 2020 | Base Case | 0.47 | 0.56 | 0.58 | 0.10 | 6.82 |
| | Clear Skies | 0.44 | 0.22 | 0.24 | 0.03 | 1.58 |

**Costs:** Nationwide, the projected annual costs of Clear Skies (in $1999) are $3.69 billion in 2010 and $6.49 billion in 2020.[5]

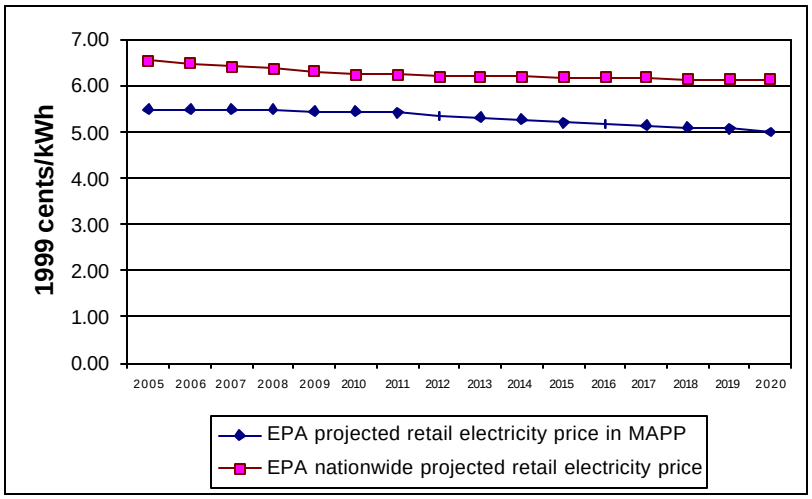
[4] The base case includes Title IV, the $NO_x$ SIP call and State-specific caps in CT, MO and TX. It does not include mercury MACT in 2008 or any other potential future regulations to implement the current Clean Air Act.

[5] EPA uses the Integrated Planning Model (IPM) to project the economic impact of Clear Skies on the power generation sector. IPM disaggregates the power generation sector into specific regions based on properties of the electric transmission system, power market fundamentals, and regional environmental regulations. These regions do not conform to State or EPA region boundaries making some compliance options, such as dispatch, and associated costs impractical to differentiate at a State or Regional level.

**Changes in Projected Retail Electricity Prices Under Clear Skies**: Electricity prices in North Dakota would not be significantly affected by Clear Skies.

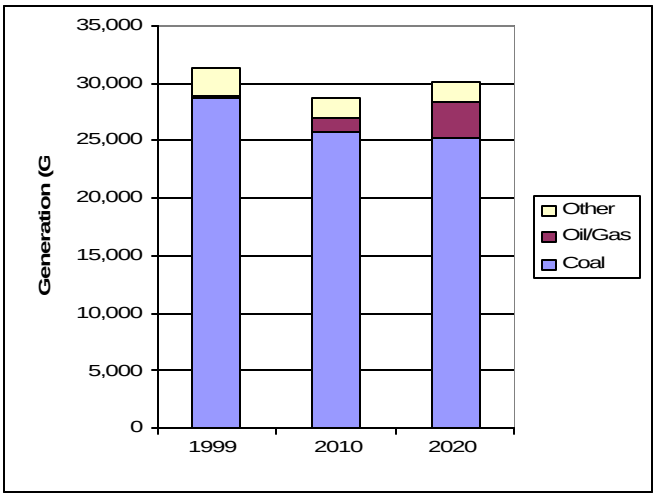
- In 1999, the average retail electricity price in North Dakota was approximately 5.49 cents/kWh, which was slightly below the average *national* retail price of approximately 6.66 cents/kWh.[6] As shown in Figure 3, retail prices in MAPP (the North American Electric Reliability Council (NERC) region that contains North Dakota) are projected to decrease and remain below the national average between 2005 and 2020.[7]

***Figure 2**. Projected Retail Electricity Prices in MAPP under Clear Skies (2005-2020)*




**Generation in North Dakota Under Clear Skies**: Coal-fired power plants currently produce 91% of the electricity generated in North Dakota. This level of coal-fired generation would decrease to approximately 90% of all generation by 2010 and 84% of all generation by 2020.

***Figure 3**. Current and Projected Generation by Fuel Type in North Dakota under Clear Skies (GWh)*[8]




[6] Source: 1999 EIA data at http://www.eia.doe.gov/cneaf/electricity/page/fact_sheets/retailprice.html

[7] State-level retail electricity prices vary considerably across the United States. Variation in prices can be caused by many factors including access to low cost fuels for generating power, State taxes, and the mix of power plants in the States.

[8] Source: 1999 data from EIA at http://www.eia.doe.gov/cneaf/electricity/st_profiles/north_dakota/nd.html#t5 (Table 5).

- EPA does not project that any facilities in North Dakota would switch from coal to natural gas in response to the Clear Skies emissions caps. Instead, sources in North Dakota would reduce their emissions through the installation of control technologies.
  - By 2010, coal-fired capacity in North Dakota is projected to be approximately 3,600 MW under Clear Skies. Approximately 1,100 MW of North Dakota's coal capacity is projected to install Selective Catalytic Reduction (SCR), 900 MW are projected to install scrubbers, and 400 MW are projected to install activated carbon injection (ACI).
  - Between 2010 and 2020, an additional 100 MW are projected to install SCR and 400 MW are projected to install ACI.

- 99% of North Dakota's coal-fired generation is projected to come from coal units with emission control equipment in 2010 and 2020. [9]

**Coal Production in North Dakota**: North Dakota currently produces approximately 3% of the nation's coal supply, and has about 2% of the nation's coal reserves.[10]

- EPA projects a *nationwide* 7.2% increase in coal production by 2020, relative to 2000. Preliminary analysis shows a 6% decrease in total coal production in the West between 2000 (510 million tons) and 2020 (479 million tons). [11]

- Based on preliminary analysis, EPA projects a slight decrease in coal mining jobs by 2020 in West relative to the base case.

**Major Generation Companies in North Dakota**: The ten largest plants in the State -- each over 10 MW -- are a combination of hydro, coal- and petroleum-fired units. The major generation companies include: Northern States Power Co., Otter Tail Power Co., MDU Resources Group, Inc., Basin Electric Power Coop., and Cass County Electric Coop, Inc.

[9] Emissions control equipment includes, where applicable, scrubbers, selective catalytic reduction, selective non-catalytic reduction, gas-reburn and activated carbon injection.
[10] Source: 2000 Coal Industry Annual, Tables 1 and 33
[11] Because coal supply regions generally do not confirm to State boundaries, it is impractical to project coal production at a State-level.