

US EPA ARCHIVE DOCUMENT

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 WYOMING ¹

Human Health and Environmental Benefits of Clear Skies: Clear Skies would protect human health, improve air quality, and reduce deposition of sulfur dioxide (SO₂), 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.
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- There are no counties in Wyoming currently projected to be out of attainment with the annual fine particle or 8-hour ozone standards. Clear Skies would, however, achieve additional reductions or moderate projected increases in fine particle concentrations under the existing Clean Air Act that will protect human health.
 - Clear Skies delivers numerous environmental benefits by 2020:
 - nitrogen deposition would be reduced by up to 15% throughout the state; and
 - under Clear Skies, the Western Regional Air Partnership agreement will be honored, and the WRAP emissions reductions are expected to take effect; this will allow future growth in the West to occur without degrading visibility.

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.

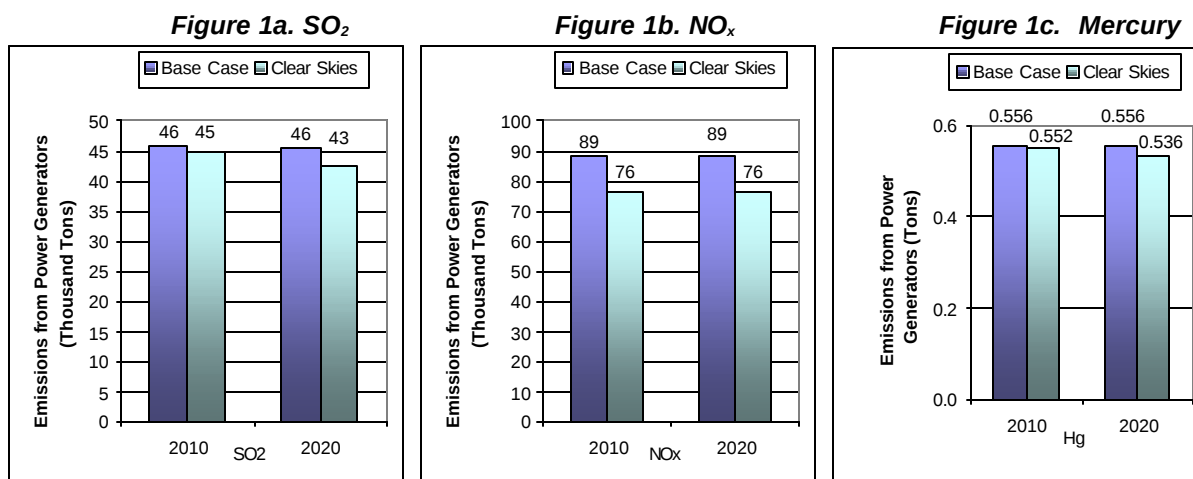
Changes in Emissions Under Clear Skies: Clear Skies is projected to result in significant emissions reductions from power generators by 2020.

- In Wyoming, Clear Skies is projected to significantly reduce emissions from power generators by 2020 (relative to 2000 emissions):
 - SO₂ emissions would be reduced by 47%;
 - NO_x emissions would be reduced by 14%; and
 - mercury emissions would be reduced by 41%.

Nationwide Emissions under Clear Skies in 2020

- SO₂ 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 SO₂, 67% for NO_x, and 69% for mercury.

Figures 1a, 1b and 1c. Existing Clean Air Act Regulations (base case⁴) vs. Clear Skies in Wyoming in 2010 and 2020



- Emissions rates in Wyoming in 2010 and 2020:

Table 1. Projected Emissions Rates in 2010 and 2020 in Wyoming

Year		SO ₂	NO _x			Hg
		Coal	All	Coal	Gas	Coal
		lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/MMBtu	lbs/TBtu
2010	Base Case	0.21	0.41	0.41	0.10	2.57
	Clear Skies	0.21	0.35	0.35	0.03	2.56
2020	Base Case	0.21	0.40	0.41	0.04	2.57
	Clear Skies	0.20	0.35	0.35	0.02	2.49

Costs: Nationwide, the projected annual costs of Clear Skies (in \$1999) are \$3.69 billion in 2010 and \$6.49 billion in 2020.⁵

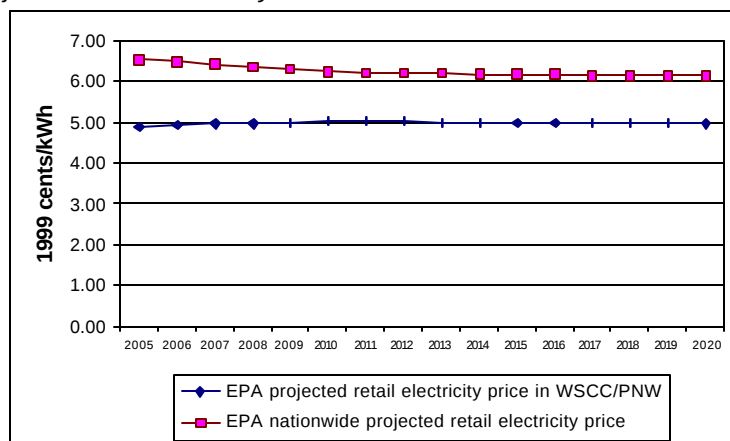
⁴ The base case includes Title IV, the NO_x SIP call and State-specific caps in CT, MO and TX. It does not include mercury MACT in 2008 or any other potential future regulations to implement the current Clean Air Act.

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 Wyoming would not be significantly affected by Clear Skies.

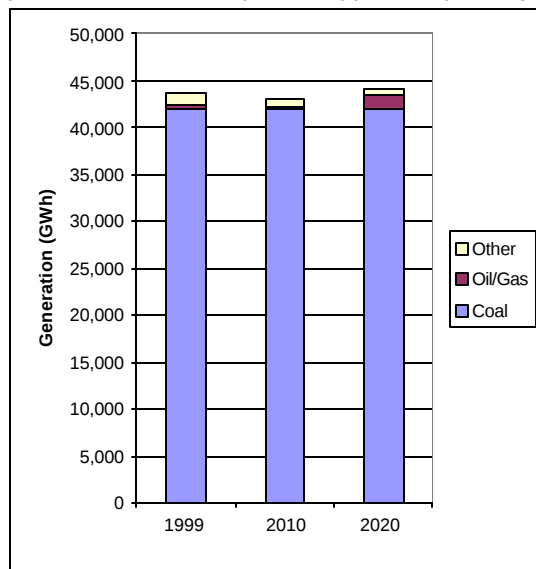
- In 1999, the average retail electricity price in Wyoming was approximately 4.30 cents/kWh, which was below the average *national* retail price of approximately 6.66 cents/kWh.⁶ As shown in Figure 3, retail prices in WSCC/PNW (the North American Electric Reliability Council (NERC) regions containing Wyoming⁷) are projected to decrease and remain below the national average between 2005 and 2020.⁸

Figure 2. Projected Retail Electricity Prices in WSCC/PNW under Clear Skies (2005-2020)



Generation in Wyoming under Clear Skies: Coal-fired power plants currently produce 96% of the electricity generated in Wyoming. This level of contribution from coal-fired generation would increase in Wyoming under Clear Skies to approximately 98% by 2010, and then decrease to 95% by 2020. By 2010, coal-fired capacity in Wyoming is projected to be approximately 5,600 MW under Clear Skies.

Figure 3. Current and Projected Generation by Fuel Type in Wyoming under Clear Skies (GWh)⁹



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

⁷ Wyoming falls under NERC regions WSCC/PNW, WSCC/Rocky Mountains, and MAPP. The region shown in the graph represents the largest capacity share of the state.

⁸ 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.

⁹ Source: 1999 data from EIA at http://www.eia.doe.gov/cneaf/electricity/st_profiles/wyoming/wy.html (Table 5).

- EPA does not project that any facilities in Wyoming would switch from coal to natural gas in response to the Clear Skies emissions caps.
- Approximately 85% of Wyoming's coal-fired generation is projected to come from coal units with emission control equipment in 2010, and 85% in 2020.¹⁰

Coal Production in Wyoming: Wyoming currently produces approximately 31% of the nation's coal supply, and has about 13% of the nation's coal reserves.¹¹

- 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).¹²
- 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 Wyoming: The ten largest plants in the State -- each over 30 MW -- are a combination of hydro, petroleum-, gas- and coal-fired plants. The major generation companies include: PacifiCorp, Powder River Energy Corp., Cheyenne Light Fuel & Power Co., High Plains Power, Inc. and Lower Valley Energy Inc.

¹⁰ Emissions control equipment includes, where applicable, scrubbers, selective catalytic reduction, selective non-catalytic reduction, gas-reburn and activated carbon injection.

¹¹ Source: 2000 Coal Industry Annual, Tables 1 and 33.

¹² Because coal supply regions generally do not confirm to State boundaries, it is impractical to project coal production at a State-level.