



**CLEANING UP
AIR POLLUTION
FROM
AMERICA'S POWER PLANTS**



THE FACTS





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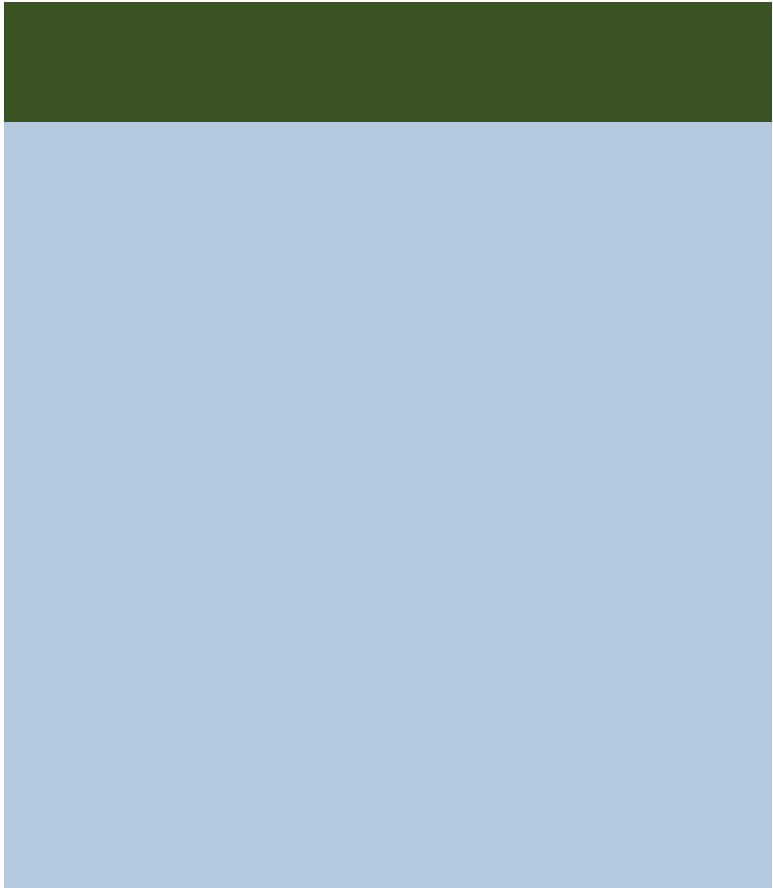
THE ELECTRIC UTILITY INDUSTRY AT A CROSSROADS



INTRODUCTION

The electric utility industry is at a crossroads. The industry has been a dominant force in the economy for decades, but it is now facing a number of challenges that are forcing it to change. These challenges include the need to invest in new infrastructure, the need to improve efficiency, and the need to address environmental concerns. The industry is also being challenged by new entrants, such as renewable energy sources and smart grids. The industry must find ways to adapt to these changes in order to remain competitive and to continue to provide reliable and affordable electricity to its customers.

The industry is also facing a number of regulatory challenges. The Federal Energy Regulatory Commission (FERC) is currently reviewing the industry's proposed changes to the way it is regulated. The industry is also facing a number of state-level regulatory challenges. The industry must work with regulators to develop a regulatory framework that will allow it to continue to provide reliable and affordable electricity to its customers.



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U.S. Department of Energy, "Scenarios for a Clean Energy Future,"
 November, 2000, p. 7.2

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The electric utility industry is a critical part of the economy. It provides the power that drives our lives and businesses. The industry is facing a number of challenges, including the need to invest in new infrastructure and the impact of climate change.

The industry is also facing a number of opportunities, including the potential for renewable energy and smart grid technology. The industry is working to address these challenges and opportunities to ensure a secure and reliable energy future for all Americans.

The industry is committed to providing reliable and affordable energy to all Americans. We are working to improve our operations and reduce our environmental footprint. We are also working to ensure that our energy system is secure and resilient.

The industry is also committed to providing excellent customer service. We are working to improve our customer experience and ensure that we are meeting the needs of our customers. We are also working to ensure that our energy system is secure and resilient.

The industry is also committed to providing a safe and healthy environment. We are working to reduce our greenhouse gas emissions and improve our air quality. We are also working to ensure that our energy system is secure and resilient.

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Electricity and Gas

2019-2020 Budget

Table 1.2: Operating Expenses

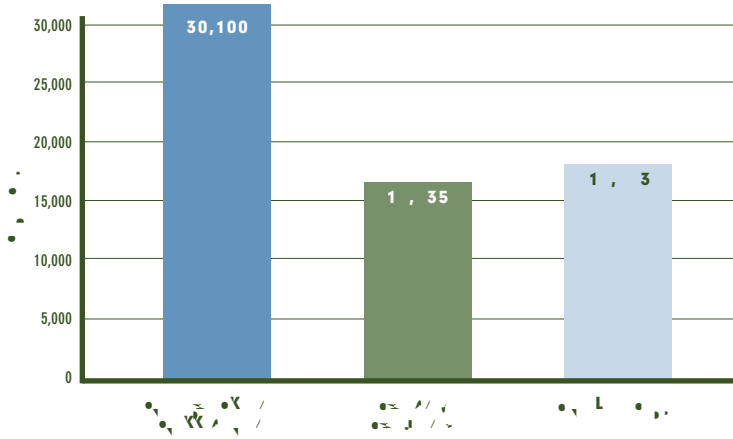
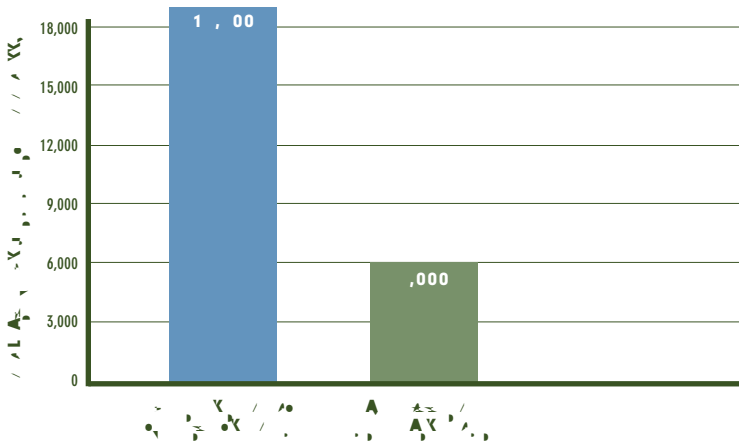
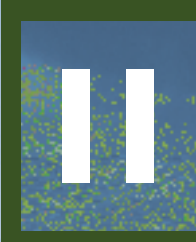


Table 1.3: Capital Expenditures

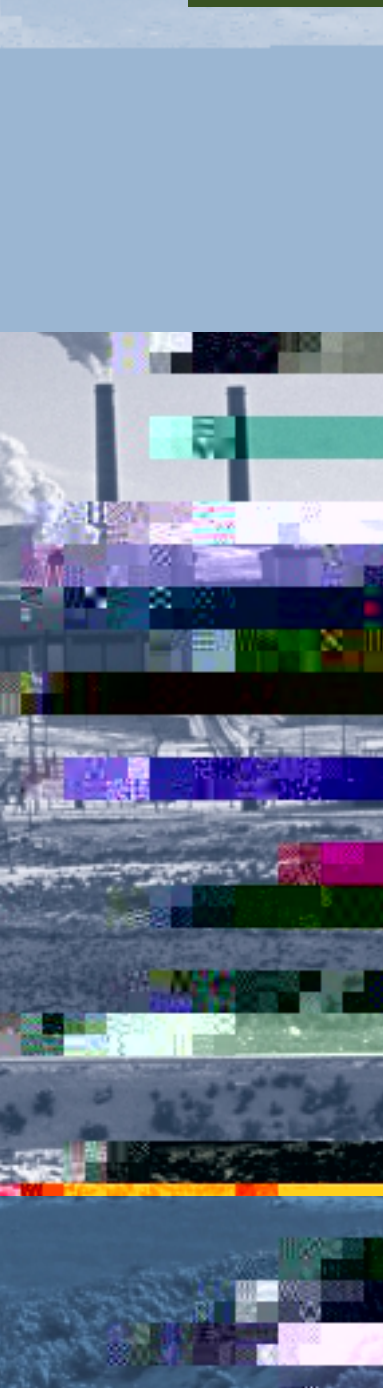


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- 1 White House National Energy Policy Development Group, *Reliable, Affordable and Environmentally Sound Energy for America's Future*, May 2001, "Overview," p. xi; <http://www.whitehouse.gov/energy/Overview.pdf>.
 - 2 Harlan Byrne, "Too Much Power? The Utility Industry's in a Building Boom. Why Skeptics Fear a Bust," *Barron's*, August 6, 2001.
 - 3 According to U.S. EPA, moderate to advanced utilization of energy efficiency measures will reduce electricity demand by between 8% and 24% from a "business as usual" scenario. U.S. EPA, *Economic Analysis of a Multi-Emissions Strategy* (preparhPR.6aC[ah efficiency measures





POLICIES AND PROPOSALS



The first part of the report
 is devoted to the analysis of
 the current situation in the
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 by a detailed description of
 the existing energy efficiency
 measures and their impact
 on the energy consumption
 of buildings. The report
 also includes a list of
 recommendations for
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The following table shows the number of power plants in the United States that are subject to the Clean Air Act (CAA) and the Clean Water Act (CWA). The table is divided into two columns: CAA and CWA. The rows represent different types of power plants: Coal, Gas, Nuclear, and Other.

Table 1: Number of Power Plants Subject to the Clean Air Act (CAA) and the Clean Water Act (CWA)

Power Plant Type	CAA	CWA
Nine Chicago, Illinois-Area Power Plants. ¹	300	200
Two Southeastern Massachusetts Power Plants. ²	159	124

The table shows that there are 300 power plants in the Chicago, Illinois-Area that are subject to the CAA and 200 power plants in the same area that are subject to the CWA. Similarly, there are 159 power plants in the Southeastern Massachusetts area that are subject to the CAA and 124 power plants in the same area that are subject to the CWA.

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Governor George W. Bush,
 "A Comprehensive National Energy Policy," September 29, 2000.

ELECTRIC INDUSTRY EXECUTIVES RECOGNIZE THE VALUE OF CLEANING UP ALL MAJOR POLLUTANTS IN ONE COMPREHENSIVE PLAN

“A piecemeal pollutant-by-pollutant approach to emissions reductions is costly and inefficient.... In comparison, an integrated strategy would allow electricity generators to optimize their pollution control decisions.”

The Clean Energy Group³²

“It makes good business sense to know what our CO₂ control obligations might be for a period of time so that we can factor that into our decisions when we comply with the other emissions reductions.... If we know the whole package, including CO₂, we’d probably make a decision to retire more plants.”

Dale Heydlauff, Senior Vice President for Environmental Affairs, American Electric Power³³

“Our proposal calls for mandatory, nation-wide emissions caps for nitrogen oxide, sulfur dioxide, mercury and carbon dioxide [emphasis added]; established dates certain for producing necessary emissions reductions; [and] implementation through emissions banking and trading....”

Frank Cassidy, President, PSEG Power, LLC³⁴

“The fragmented regulatory framework which now applies to electric power plants emissions is blocking progress toward our long-term energy and environmental goals. There is need for a coordinated multi-pollutant framework for power plant emissions....”

James E. Rogers, Vice Chairman, President, and CEO,

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¹ U.S. EPA, *Air Quality Where You Live*

¹⁷ Tripp Baltz, "New Source Review Must Be Eliminated in Any Trading Bill, Air Chief Says," *BNA Daily Environment Report*, March 18, 2002.

¹⁸ The White House, "Executive Summary," *The Clear Skies Initiative*, February 14, 2002; <http://www.whitehouse.gov/news/releases/2002/02/clearskies.html>.

¹⁹ Tripp Baltz, *op cit*.

²⁰ Alex Canizares, "Cinergy, Southern to Gain From Clean-Air Law Changes," *Bloomberg News*, January 2, 2002. Article based on interview of EPA official William Harnett.

²¹ *Ibid*.

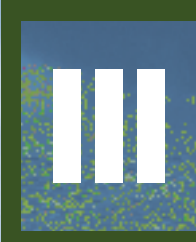
²² A summary of compliance strategies implemented by the 443 coal-fired units regulated under Phase I of the acid rain program is as follows: fuel switching: 162 (37%); purchasing pollution allowances from other units: 39 (9%); installing emissions controls (fuel gas de-sulfurization): 27 (6%); using previously installed controls: 25 (6%); retiring facilities: 7 (2%); boiler re-powering: 1 (< 1%); substituting and compensating units: 182 (41%). Source: U.S. Department of Energy, Energy Information Administration, Form EIA-767; <http://www.eia.doe.gov/cneaf/electricity/page/eia767.html>.

²³ Clean Air Act,



(a) Clean Energy Group companies are: Conectiv, Consolidated Edison, Inc., Entergy Corp., Exelon Power Corp., KeySpan, Northeast Utilities, Ontario Power Generation, Inc.,





POWER PLANT CLEANUP: MYTHS AND FACTS



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How much more pollution will be allowed by the Bush plan?

The Bush plan allows for a significant increase in pollution from power plants. It allows for a 36% increase in nitrogen oxides (NO_x) emissions, a 50% increase in sulfur dioxide (SO₂) emissions, and a 200% increase in mercury (Hg) emissions. Additionally, it allows for a delay in the implementation of existing programs, with an 8-year delay for NO_x, a 6-year delay for SO₂, and a 10-year delay for Hg.

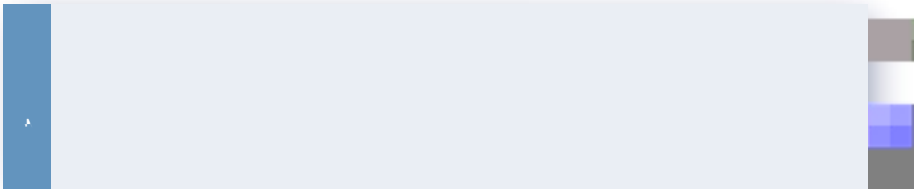
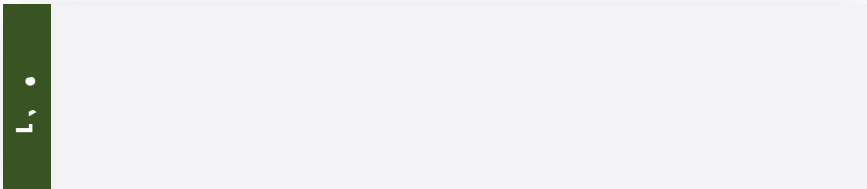
Table 1: Comparison of Emissions Caps and Delays for Clean Air Act and Bush Plan

	NITROGEN OXIDES (NO _x)	SULFUR DIOXIDE (SO ₂)	MERCURY (Hg)	CARBON DIOXIDE (CO ₂)
Clean Air Act (existing programs) ¹	1.25 million ton cap by 2010 ²	2 million ton cap by 2012 ³	Maximum emission of 5 tons per year by 2008 ⁴	
Bush "Clear Skies" Plan (two-step approach) ⁵	2.1 million ton cap by 2008 1.7 million ton cap by 2018	4.5 million ton cap by 2010 3 million ton cap by 2018	Maximum emission of 26 tons per year by 2010 Maximum emission of 15 tons per year by 2018	No Limit
Increase allowed by Bush plan over Clean Air Act existing programs (by 2018) ⁶	450,000 tons more NO _x	1 million tons more SO ₂	10 tons more Hg	No Limit
% increase allowed by Bush plan over Clean Air Act existing programs (by 2018)	36% more NO _x	50% more SO ₂	200% more Hg	No Limit
Delay allowed by Bush plan over Clean Air Act existing programs	8-year delay	6-year delay	10-year delay	

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Increasing Electricity Availability From Coal-Fired Generation in the

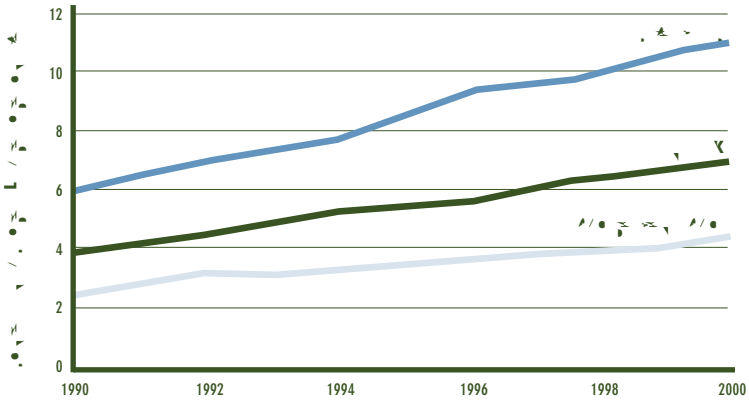
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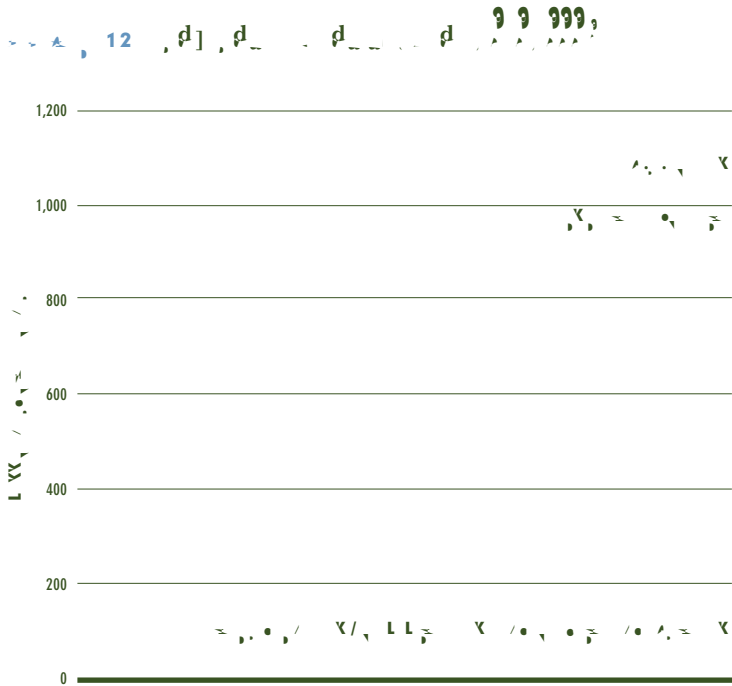
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- în grupul de vârstă de 12-17 ani, numărul de persoane este de 1,200. În grupul de vârstă de 18-24 ani, numărul de persoane este de 1,000. În grupul de vârstă de 25-34 ani, numărul de persoane este de 800. În grupul de vârstă de 35-44 ani, numărul de persoane este de 600. În grupul de vârstă de 45-54 ani, numărul de persoane este de 400.

- Pe alți copii și adolescenți, numărul de persoane este de 1,000. Pe tinerii de 18-24 ani, numărul de persoane este de 800. Pe adulții de 25-34 ani, numărul de persoane este de 600. Pe adulții de 35-44 ani, numărul de persoane este de 400. Pe persoanele de 45-54 ani, numărul de persoane este de 200.

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⁷ U.S. EPA, *Economic Analysis of a Multi-Emissions Strategy*, prepared for Senators James M. Jeffords and Joseph I. Lieberman, October 31, 2001, p. 27; <http://www.epa.gov/air/jeffordslieberm.pdf>. The reduction target analyzed by EPA was 58 million metric tons of carbon by 2020.

⁸ U.S. Department of Energy,

²⁰ National Environmental Trust, *Powering the Future: Clean Energy for a Clean Environment*, 1997. This report uses U.S. EPA and U.S. DOE data to calculate emission rates for power plants. The average emissions rates (lb CO₂/MWh) vary tremendously for coal and for natural gas, as much as 40%. On average, coal-fired plants emit 2,300 lb/MWh, and natural gas-fired plants emit 1,300. Given the current amounts of generation from each fuel, a 5% increase in efficiency means 40 million metric tons of carbon equivalent (MMtC) not released into the atmosphere. This is approximately 10% of the U.S. reduction goal under the Kyoto Protocol. For a copy of this report, contact National Environmental Trust, 202-887-8800.

²¹ Coal-fired power plants are approximately 33% efficient, on average. This means that only 33% of the energy potentially obtained from burning the coal is actually converted to electricity. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, *Scenarios of U.S. Carbon Reductions: Potential Impacts of Energy Technologies by 2010 and Beyond* (Report # ORNL/CON-444, Washington, DC, 1997), pp. 7.28-7.29.

²² *Ibid.*

²³ Capital improvements other than new construction typically require a two-year payback period before investment will occur. New Jersey Department of Environmental Protection, *Evaluation of the Effectiveness of Pollution Prevention Planning in New Jersey*, May 1996. Companies, however, capitalize new construction and new processes over 20 years or more. Many energy efficiency projects have paybacks longer than two years, especially if new equipment is involved. In general, companies choose to treat energy efficiency as any other capital investment, rather than giving it the status of a genuine process upgrade; consequently, it won't necessarily get done.

²⁴ For example, see F. Irwin *et al.*, *Tak::D7Byte outs of Carbo: Elfecroni csInnovationfor#*

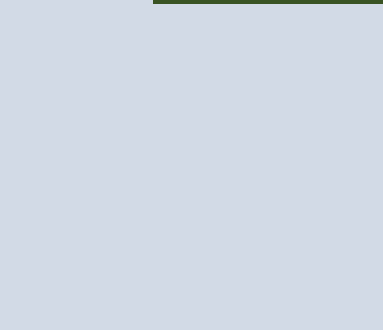
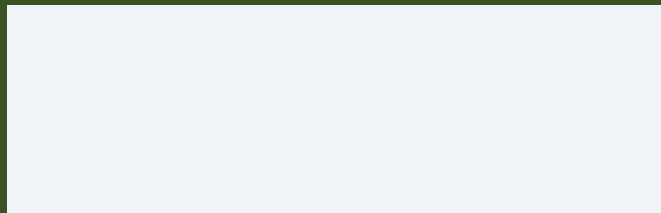
³² The Mellman Group, Inc., "Ohio 6th Congressional District Voter Attitudes Toward Clean Air Regulations," September 8, 1998. The Mellman Group designed and administered this survey conducted by professional interviewers. The survey interviewed 400 likely November 1998 voters in Ohio's 6th Congressional District. The survey was conducted between August 25 and 27, 1998. The margin of error is +/- 4.9 percentage points at the 95% confidence level. A copy can be obtained from National Environmental Trust, 202-887-8800.

³³ Clean Air Task Force, *Scraping the Bottom of the Barrel for Power: Why There Is No Need to Relax Clean Air Safeguards on Dirty Power Plants to "Keep the Lights On,"* November 8, 2001; <http://cta.policy.net/relatives/18560.pdf>. See Appendix A, "Electric Power New Capacity Additions Update," Erin O'Neill, The NorthBridge Group, October 31, 2001 ("U.S. Historic and Projected Capacity Additions"). New generation projections in this "Update" are based on a forecast prepared by The NorthBridge Group. Information on plants under construction or in the development process used to prepare this forecast comes from the October update of "NEWGen" database maintained by Resource Data International (RDI). The process for siting, permitting, and constructing a new power plant typically takes four to five years. The status of plants in the early stages of this process is less certain than those in advanced stages of development. Thus, new power plant development projections can only be made based on current market activity through about 2004-6.

³⁴ *Ibid.*

³⁵ *Ibid.*





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Air Pollution from Power Plants Harms Public Health

Fine Particle Soot: When power plants burn coal, they produce sulfur dioxide that forms fine particles that are extremely harmful to human health. These particles can be inhaled deeply into the lungs where they lodge, causing severe damage, including asthma attacks, respiratory illness, and premature death. Sulfur dioxide from power plants is the leading cause of fine particle soot in the eastern half of the U.S.⁶

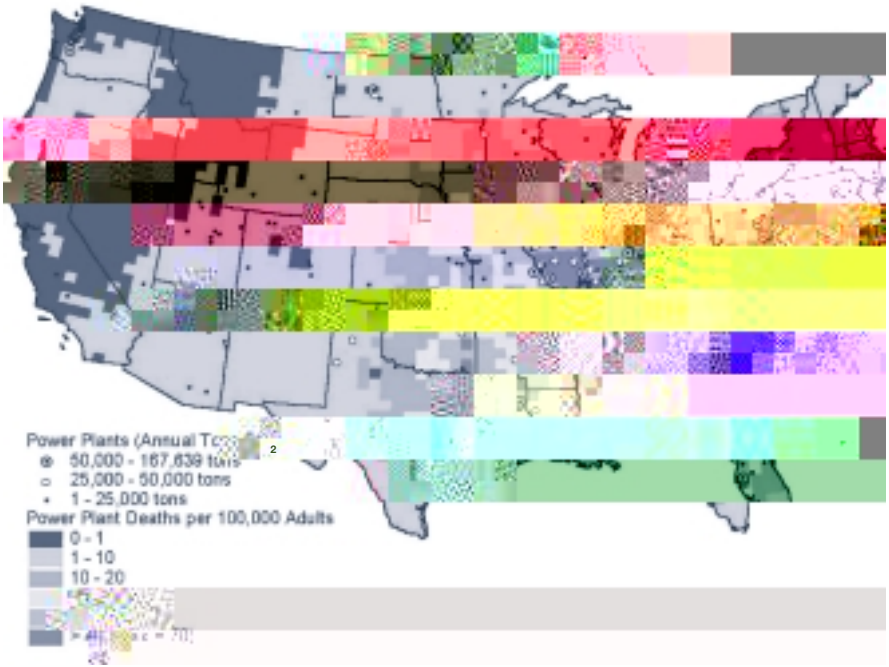
Ozone Smog: Power plants produce nitrogen oxides that are transformed into ozone smog on hot summer days, resulting in “code red” conditions in cities and towns throughout the U.S. Ozone smog causes respiratory damage ranging from temporary discomfort to asthma attacks and long-term, permanent lung damage. Coal-burning power plants produce more nitrogen oxide pollution than any other industrial source.⁷

all the time, and they are not just a problem for the
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The map shows the distribution of power plants across the United States, with a concentration in the eastern and central regions. The size of the symbols indicates the annual tonnage of emissions, and the shading indicates the number of deaths per 100,000 adults.

The map is titled "Power Plants (Annual Tons)" and "Power Plant Deaths per 100,000 Adults".



The map shows that the highest concentration of power plants and the highest death rates are found in the eastern and central United States. The western United States has a lower density of power plants and lower death rates.

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WHAT IS ACID RAIN?

When sulfur dioxide and nitrogen oxides are released into the atmosphere, they form acids that return to earth in rainfall. "Acid rain" accumulates in lakes and seeps into soils, causing wide-ranging damage. In addition to killing many fish species and harming others, it contributes to death and disease among several species of trees. Power plants emit about 67% of all sulfur dioxide and 25% of all nitrogen oxides in the U.S., making them the single largest source of acid rain.¹²

Table 1: Visibility Loss Due to Haze at Seven National Parks

| PARK | WORST DAY | BEST DAY | VISIBILITY LOSS |
|--|-----------|-----------|-----------------|
| Acadia National Park (ME) | 16 miles | 87 miles | 82% |
| Big Bend National Park (TX) | 37 miles | 118 miles | 69% |
| Glacier National Park (MT) | 29 miles | 94 miles | 69% |
| Grand Canyon National Park (AZ) | 61 miles | 145 miles | 58% |
| Great Smoky Mountains Nat'l Park (TN/NC) | 60 miles | 12 miles | 80% |
| Point Reyes Wilderness Area (CA) | 15 miles | 88 miles | 83% |
| Shenandoah National Park (VA) | 10 miles | 54 miles | 81% |

These are the estimated visibility loss percentages for each of the seven national parks. The visibility loss is calculated as the percentage of the best day's visibility that is lost on the worst day. For example, at Acadia National Park, visibility is 87 miles on the best day and 16 miles on the worst day, resulting in an 82% visibility loss.

The first step in the process is to identify the potential impacts of the proposed project. This involves a thorough review of the project description and the environmental context. The next step is to assess the significance of the impacts, taking into account both the magnitude and the frequency of the effects. This is done by comparing the predicted impacts against established criteria and standards. The final step is to develop mitigation measures to avoid, minimize, or compensate for the adverse effects. These measures should be integrated into the project's implementation and monitoring plans.

The following table provides a summary of the key findings from the impact assessment. It details the nature of the impacts, their potential severity, and the proposed mitigation strategies.



Source: National Park Service

The following table provides a summary of the key findings from the impact assessment. It details the nature of the impacts, their potential severity, and the proposed mitigation strategies.



Source: National Park Service

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3. **Prevalence of HIV/AIDS in the population**
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16. HIV/AIDS

1. **Prevalence of HIV/AIDS**
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The National Academy of Sciences was congressionally chartered to advise Congress on scientific and technical questions. Its principal fact-finding arm, the National Research Council, completed *Climate Change Science: An Analysis of Some Key Questions* in June 2001 at the request of President Bush. The report characterized the global warming trend over the last 100 years, examined some of the likely consequences in the 21st century, and discussed the extent to which human activity may be responsible for warming. The panel preparing the report consisted of 11 prominent U.S. climate scientists, including a Nobel laureate.

The Intergovernmental Panel on Climate Change (IPCC), established in 1988 by the United Nations, comprises 2,000 climate experts and scientists from around the world who are charged with assessing the technical issues of global warming and providing policy makers with guidance on mitigation options. Presidents Ronald Reagan and George H. W. Bush endorsed the formation of the IPCC to ensure thorough and fair review of emerging scientific findings on climate change. Building on past reports and incorporating the results of new research over the past five years, the IPCC's *Third Assessment Report*, issued in February 2001, is the most emphatic warning yet about the dangers of global warming.

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- 1 Abt Associates, *The Particulate-Related Health Benefits of Reducing Power Plant Emissions*, October 2000; http://www.clnaf.org/resources/reports/Abt_PM_report.pdf. Abt Associates is EPA's leading health-damage consultant, and conducted its analysis using the methodology approved by EPA's independent Science Advisory Board. For a quick reference to the key findings of the Abt Associates study, see *Clear the Air, Death, Disease & Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants*, October 2000, pp. 3 and 5; <http://cta.policy.net/fact/mortality/mortalitylowres.pdf>.
- 2 "Health Benefits of Emissions Reductions from Older Power Plants," *Risk in Perspective*, Vol. 9, Issue 2, Harvard Center for Risk Analysis, April 2001.
- 3 Abt Associates, *The Particulate-Related Health Benefits of Reducing Power Plant Emissions*, and *Clear the Air, Death, Disease & Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants*, p. 5.
- 4 Dr. John Peters (director), "Epidemiologic Investigation to Identify Chronic Health Effects of Ambient Air Pollutants in Southern California" (known as "The Children's Health Study"), February 2002; <http://www.arb.ca.gov/research/chs/chs.htm>.
- 5 U.S. Public Interest Research Group, *Danger in the Air: Unhealthy Smog Days in 2000* (January 2001), p. 7, Table 1, "Summary of 2000 Exceedances and Smog Days by State"; <http://uspirg.org/reports/Dangerintheair2000.pdf>.
- 6 U.S. EPA, *National Air Pollutant Emissions Trends, 1900-1998*, March 2000, Chapter 1.2, p. 1-2 and Figure 2-4, p. 2-12; <http://www.epa.gov/ttn/chief/trends/trends98/trends98.pdf>.
- 7 *Ibid.*, Chapter 1.2, p. 1-1 and Figure 2-2, p. 2-10.
- 8 Ohio Environmental Council, *Ohio Valley - Ozone Alley*, February 2000; http://www.theoec.org/pubs_airenerg.html.
- 9 J. I. Levy et al., "Using CALPUFF to evaluate the impacts of power plant emissions in Illinois: Model sensitivity and implications," *Atmospheric Environment*, 36 (6): 1063-1075 (2002); <http://www.hsph.harvard.edu/press/releases/press1032001.html>. Also J. I. Levy and J. D. Spengler, "Modeling the benefits of power plant emission controls in Massachusetts," *Journal of Air & Waste Management Association*, 52: (2002); <http://www.hsph.harvard.edu/papers/plant/plant.pdf>.
- 10 U.S. EPA, *Progress Report on the EPA Acid Rain Program*, November 1999, pp. 12-14; <http://www.epa.gov/airmarkets/progress/arpreport/acidrainprogress.pdf>.
- 11 *Ibid.*, p. 12.
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