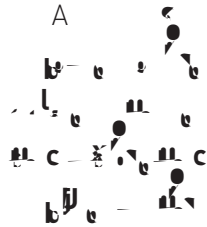


Stop Blowing Smoke in the Heartland

PROTECTING HUMAN HEALTH
FROM SMOKESTACK POLLUTION



e 
ENVIRONMENTAL
finding the ways that work

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Environmental Defense gratefully acknowledges Jana Milford, who was instrumental to the report's production.

Cover photos: Corbis.

The image displays a musical score for two staves, likely piano and violin/viola. The notation includes various note values, rests, and dynamic markings. The first staff begins with a treble clef and a key signature of one flat (B-flat). The second staff begins with a bass clef and a key signature of one flat (B-flat). The score is divided into two main sections. The first section starts with a treble clef and a key signature of one flat, featuring notes such as C, CA, and f, with dynamic markings like f and accents. The second section starts with a bass clef and a key signature of one flat, featuring notes such as A, A, A, and A, with dynamic markings like f, ff, and accents. The score concludes with a double bar line and a key signature change to one sharp (F-sharp).

0 2000 4000 6000 8000 10000 12000

be \$1,000 per ton. Figure A, which is based on EPA data, compares the SO₂ pollution reduction investments for motor vehicles, diesel freight trucks, and industrial smokestack scrubbing. In dramatic contrast with power plants, these other major economic sectors are required to invest many thousands of dollars per ton to clean up each ton of SO₂.

Even a \$1,500 per ton threshold for power plants would be highly cost-effective compared to other national EPA programs to reduce SO₂, and such costs would be far surpassed by the human health benefit of controlling SO₂ at smokestacks. The human health benefits of lowering SO₂ from power plants are valued at \$15,000 per ton. Modestly increasing the cost-effectiveness threshold to \$1,500 per ton for SO₂ and a similar increase for NO_x would annually prevent some 16,000 premature deaths from particulate pollution, and 1,000,000 asthma episodes in children across the eastern region subject to EPA's initiative.

The Heartland is hit hardest by power plant pollution and has the most to gain from tougher EPA clean up standards. Using EPA's methodology, Environmental Defense estimated both the number of avoided premature deaths and the number of avoided asthma episodes in children in each affected state by modestly increasing smokestack pollution control investments. Figure B shows the top fifteen states that stand to benefit from strengthening EPA's proposal by raising the SO₂ cost-effectiveness threshold to \$1,500 per ton.

Strengthening pollution limits on smokestacks would also aid the many communities struggling to restore healthy air. According to EPA's own analysis, millions of

standards. But EPA disregards this body of analysis and instead uses its lax cost-effectiveness test as the primary tool for establishing its proposed SO₂ pollution cap of 2.7 million tons for the 28-state region. A modest cost-effectiveness threshold of \$1,500 per ton, far less than the investments being asked of other economic sectors to lower SO₂, would lead to a regional limit for SO₂ of 1.6 million tons per year.

Environmental Defense recommends EPA adopt tougher pollution limits to protect human health: the SO₂ from eastern power plants in the 28 states

Air pollution has taken a tremendous toll on human health and the environment, with power plants emitting 68% of sulfur dioxide (SO₂) and 22% of NO_x pollution nationally (see Figure 1).² Because of these high emissions, power plant pollution is implicated in tens of thousands of premature deaths and many more asthma attacks, respiratory and cardiovascular illnesses as well as a host of other health and environmental effects. EPA recently found that well over half of the American



The same particulate pollution that harms human health also pollutes the scenic vistas at national parks and wilderness areas. Visibility in the southern Appalachian Mountains has declined by an estimated 78% from natural levels. Natural visibility is estimated to be 113 miles on an average day in the Smoky Mountains, but today air pollution haze has cut visibility to an average of 25 miles.⁴ Much of the loss in visibility can be traced back to pollution from coal-fired power plants.



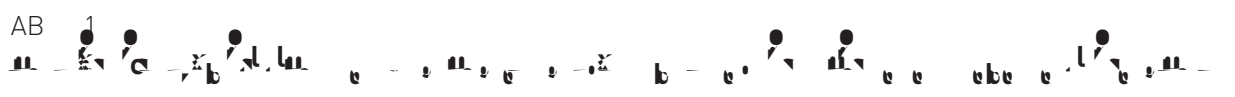
Air pollution causes acid rain and nitrogen deposition, which make vegetation more susceptible to disease and pests, contributing to stunted growth and significant declines in populations of tree species throughout the East. Atmospheric nitrogen also contributes to harmful levels of nutrient loading in sensitive coastal and estuarine water systems such as the Chesapeake Bay, Long Island Sound and the Tar-Pamlico watershed. Excess nitrogen loading from power plant NO_x and other sources in waterways overstimulates algae growth, which depletes oxygen levels, causing fish kills and destroying ecologically and commercially valuable plants. Power plants need to be cleaned up across the eastern United States to remedy the ecosystem impacts of pollution.



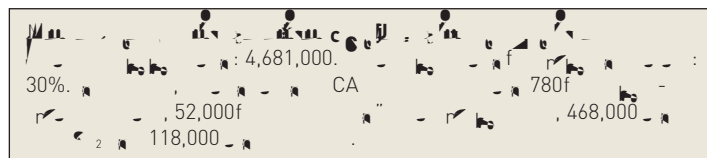
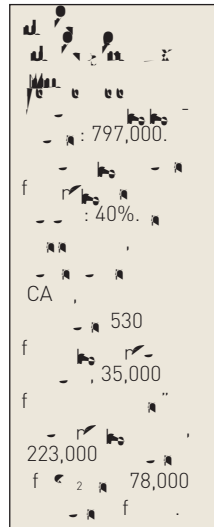
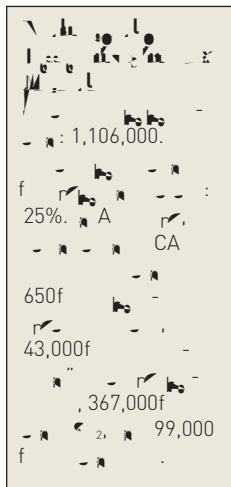
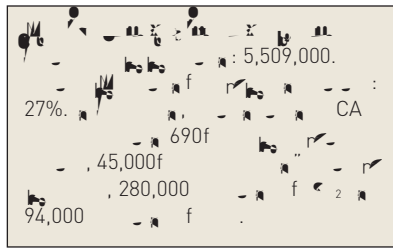
To its credit, EPA is breaking through the political logjam in Congress by using its existing power under the Clean Air Act to lower smokestack pollution. Dubbed the “Clean Air Interstate Rule,” the EPA initiative would establish statewide limits on power plant pollution of SO₂ and NO_x. The rule is based on the “good neighbor” provisions of the Clean Air Act that prohibit an upwind state from discharging pollution that significantly contributes to unhealthy air in a downwind state. But no one will begin to breathe cleaner air until EPA makes this rule final. Moreover, millions of Americans in the Heartland will be left behind unless EPA toughens its power plant clean up standards. This report shows that by any measure—public health or economics—the EPA power plant initiative can and should be strengthened.



Power plants are blowing smoke across this nation with communities in the Heartland being the hardest hit. In order to disperse their air pollution, power companies constructed their smokestacks hundreds of feet high. The tall smokestacks discharge pollution that has a cascade of impacts, harming local communities and then being carried downwind hundreds of miles where it has far-reaching human health and environmental consequences. Table 1 ranks the communities in the eastern United States in order of the percent of particulate pollution received from upwind states. For example, Louisville, Kentucky, suffers from unhealthy particulate pollution and receives over 40% of its pollution from sources in upwind states.



F 2



(A C), ()
(F)
C)
(A A) f
C) ()
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(C C), ()
(C C), ()
(C C), A ()

8

0

5

Reducing the blowing smoke from upwind power plants is therefore essential to improve public health and bring these communities into compliance with the health-based air quality standards.



The EPA proposal to cut SO₂ and NO_x pollution from power plants in eastern states must be strengthened to protect human health in the Heartland. In fact, EPA predicts that even after implementation of its proposed Clean Air Interstate Rule millions of people across the Heartland and on the Atlantic coast will be left with unhealthy air and this rule will still allow unhealthy pollution concentrations in a number of major metropolitan areas. For example, highly populated cities such as Chicago, Detroit, Cleveland, Cincinnati, Pittsburgh, Birmingham and Atlanta will still be out of compliance with the health-based standard for particulate pollution (see Figure 2). At the same time, EPA's own analysis shows that much steeper reductions in sulfur dioxide would achieve far-reaching public health benefits and be highly cost effective.

The Heartland of the United States is hit hardest by power plant pollution and it has the most to gain from EPA strengthening its power plant clean up standards. Using EPA's methodology, Environmental Defense estimated both the number of premature deaths and the number of asthma episodes in children that could be prevented if EPA modestly increased smokestack pollution control investments

20
10
0

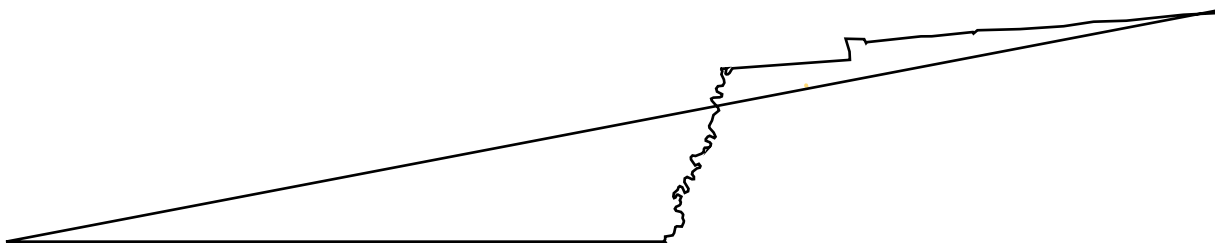


outweigh the costs. For example, Senator Jefford's proposed Clean Power Act would require deeper and faster SO₂ and NO_x cuts along with reductions of mercury and carbon dioxide levels. EPA estimates this much more ambitious legislation would cost about \$16.5 billion, still far less than the estimated \$84 billion in benefits from implementation of the CAIR. Clearly, the EPA proposal could be strengthened to achieve far greater societal benefits while still remaining cost effective.



EPA proposes to establish pollution caps of 2.7 million tons for SO₂ and 1.3 million tons for NO_x in the year 2015 over a region that includes 28 eastern states and the District of Columbia. EPA estimates the marginal cost of reductions necessary to meet these caps will be approximately \$1,000 per ton of SO₂ and \$1,500 per ton of NO_x. EPA establishes these cost-effectiveness limits as upper bounds on the pollution control investments to be made under the rule. But EPA's proposed cost thresholds are weak. EPA, for example, can substantially increase the human health and environmental benefits while still operating within a "highly cost-effective" reduction scenario by relying on pollution abatement cost thresholds of \$1,500 for SO₂ reduced and \$2,000 per ton of NO_x reduced.

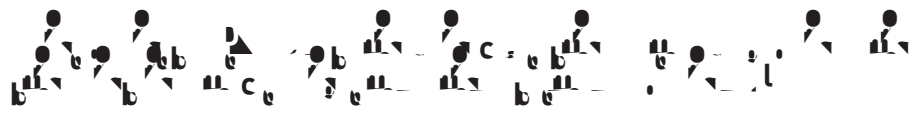
Using EPA data, Environmental Defense estimates that if EPA's cost thresholds for SO₂ and NO_x reductions were increased to \$1,500 and \$2,000 per ton respectively, SO₂



to a cap of 860,000 ton per year across the 28 state region.⁶ The \$1,500 per ton cost-effectiveness threshold for SO₂ would still be far outweighed by the estimated \$15,000 benefits per ton of SO₂ reduced.⁷

An impressive increase in human health benefits would accompany the incremental pollution reductions that occur as a result of relying on cost-effective investments of \$1,500. The resulting health benefits are listed in Table 2.⁸ Modestly increasing the cost-effectiveness threshold to \$1,500 per ton for SO₂ and a similar increase for NO_x would annually prevent some 16,000 premature deaths from particulate pollution, and 1,000,000 asthma episodes in children across the eastern region subject to EPA's initiative.

Each of the 28 states covered by the EPA proposal would realize important human health benefits from the more protective cost-effectiveness threshold. For example, Figure 5 shows that in the state of Tennessee a more protective cost-effectiveness threshold would cut SO₂ pollution by 39,300 tons annually and NO_x pollution by 14,000 tons. These pollution reductions would lead to 6,000 fewer asthma episodes in children and avoid 90 deaths. This figure also shows the high contribution of pollution that Tennessee receives from its neighbors. Similar figures for each of the 28 states covered by EPA's proposal are presented in the On-Line Appendix.⁹



North Carolina's Clean Smokestacks Act of 2002 requires significant cuts in sulfur dioxide from power plants by 2013. Based on underlying state data,¹⁰ Environmental Defense estimates that Progress Energy's average cost per ton to reduce SO₂ is \$5,042, while Duke Energy's cost per ton is \$7,588. These are just two examples of state clean air initiatives that are based on a willingness to require a much higher cost per ton investment in lowering harmful air pollution than the thresholds EPA has proposed for coal-fired power plants.

Rebecca C. Allen

The proposed EPA power plant pollution reduction program should be strengthened and swiftly finalized to protect human health. In order to ensure that the mil-

next several years. But the Agency's efforts to clean up power plant smokestacks has lagged far behind despite a body of scientific evidence connecting smokestack pollution with serious human health impacts.

Cleaning up America's dirty power plants is long overdue. EPA must adopt strong standards to protect human health and the environment from smokestack pollution. It is time to stop blowing smoke in America's Heartland.

- ¹ US EPA Press release, "EPA Administrator Tells Power Companies to Invest in Clean Air," Washington, DC, January 9, 2004; <http://yosemite.epa.gov/opa/admpress.nsf/0/217c26cff40b45a885256e16005693b5?OpenDocument>
- ² <http://www.epa.gov/ttn/chief/net/index.html>.
- ³ U.S. Environmental Protection Agency, "Benefits of the Proposed Interstate Air Quality Rule," January 2004. Docket #OAR 2003-0053-0175. <http://www.epa.gov/air/interstateairquality/technical.html>
- ⁴ National Park Service, *Proposed Air Quality Benchmarks at Great Smoky Mountains and Shenandoah National Parks*, submitted to the Southern Appalachian Mountains Initiative, November 2, 2001. <http://www.epa.gov/fedrgstr/eo/eo12866.htm>
- ⁵ <http://www.epa.gov/fedrgstr/eo/eo12866.htm>
- ⁶ Environmental Defense Written Comments to EPA on the CAIR proposal, March 30, 2004. Copy available by request to mshore@environmentaldefense.org.
- ⁷ Benefit Analysis for the Section 112 Utility Rule (EPA 452/R-03-021), <http://www.epa.gov/ttn/atw/utility/proposalutilitymactbenefitsanalysisfinal.pdf>. From this source

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