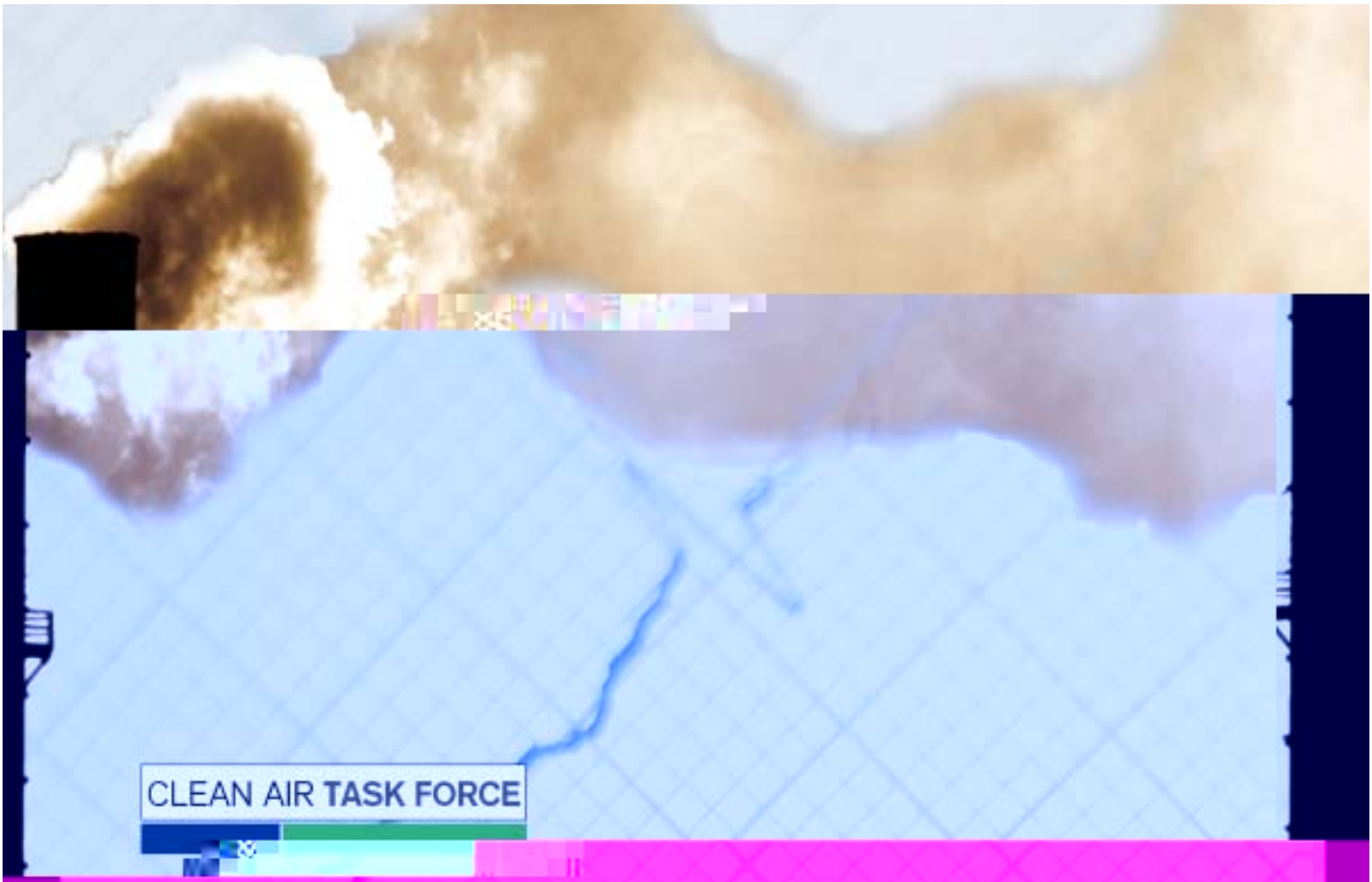

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This report, the full Abt Associates report, “Power Plant Emissions: Particulate Matter-Related Health Damages and the Benefits of Alternative Emission Reduction Scenarios” (June 2004), and the interactive site “Your Air on the Web” are available at: www. t . / t w

C fs :
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"The Dirty Secret Behind Dirty Air: Dirty Power"

by Angela Ledford, Clear the Air

Four years ago, Clear the Air released its first report on the health impacts of power plant pollution. Because of a loophole in the Clean Air Act, we pointed out, power plants built before 1970 had avoided installing modern pollution controls. Coal burning power plants were making people sick and shortening their lives – thousands of them – each year.

Something needed to be done – or at least election-year politicians knew that's what people wanted to hear. Both candidates for president said that mandatory regulations of all four major pollutants from power plants, including sulfur dioxide, nitrogen oxides, mercury, and carbon dioxide, were needed. Candidate Bush highlighted this commitment in no uncertain terms:

> *Governor Bush will work with Congress, the Environmental Protection Agency, the Department of Energy, consumer and environmental groups and industry to develop legislation that will establish mandatory reduction targets for emissions of four main pollutants: sulfur dioxide, nitrogen oxide, mercury and carbon dioxide.**

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

Dirty Air, Dirty Power, documents for the first time how many heart attacks and lung cancer deaths are caused by power plant pollution.

At the same time members of Congress in both houses, from both parties, were proposing legislation to accomplish Candidate Bush's goal. Even the electric power companies had come around to the inevitability of a massive clean up. Industry faced a gauntlet of new regulations under the Clean Air Act, each of which would entail cuts in power plant emissions. By 1999, facing millions of dollars in clean up costs following the largest clean air enforcement action by the Department of Justice in history, the electric power industry had opened discussions with the environmental community to explore clean up proposals.

Had these proposals become law, by the end of this decade we would have substantially reduced the number of ozone smog "red alert days" and asthma attacks that routinely keep kids out of school. Virtually every American would be breathing healthy air, and very few people would die from exposure to pollution from power plants.

But none of that happened because of a dirty little secret: **instead of cleaning up power plants as promised, the Bush administration is allowing the polluters to re-write clean air rules.** The Administration is presenting as "progress," proposals that delay action on air pollution, weaken health standards, and undermine enforcement of the law.

The administration began giving in to the polluters almost immediately after it took office. Two months after being sworn in, President Bush reneged on his campaign promise to require mandatory reductions in carbon dioxide – a pollutant that causes global warming. Vice President Cheney met in secret with representatives of the very companies that had been sued for violating the Clean Air Act and agreed to "study" the rules that the companies had broken. Famous last words – industry eventually got its way, and the "new source review" rules were rewritten.

But the Administration didn't stop there. Since taking office they have issued rules that:

- Delay the deadlines for reducing ozone smog;
- Delay the deadlines for removing deadly fine particles from the air;
- Delay action to reduce haze from the national parks; and
- Delay by more than 10 years real reductions in toxic mercury emissions from power plants, allowing up to seven times more mercury emissions than current law permits.

Dirty Air, Dirty Power reveals, in unprecedented detail, the human cost of the failure of our nation's leaders to solve this problem. This analysis, performed by EPA's own air quality consultants using EPA standard methodology, documents the asthma attacks, hospitalizations, lost work and school days, and premature deaths linked to pollution from power plants.

Since release of our 2000 report, *Death, Disease & Dirty Power*, new scientific studies have found links between air pollution and both heart attacks and lung cancer. This report, *Dirty Air, Dirty Power*, documents for the first time how many heart attacks and lung cancer deaths are caused by power plant pollution.

In addition, *Dirty Air, Dirty Power* goes one step further and compares the Bush administration's air pollution plan to faithful enforcement of the Clean Air Act and proposed "four-pollutant" legislation that would close the power plant loophole once and for all. The results are staggering: the government knows what to do to effectively eliminate the problem of air pollution from power plants, but the Bush air pollution plan represents

The American people need stronger, not weaker, clean air protections.

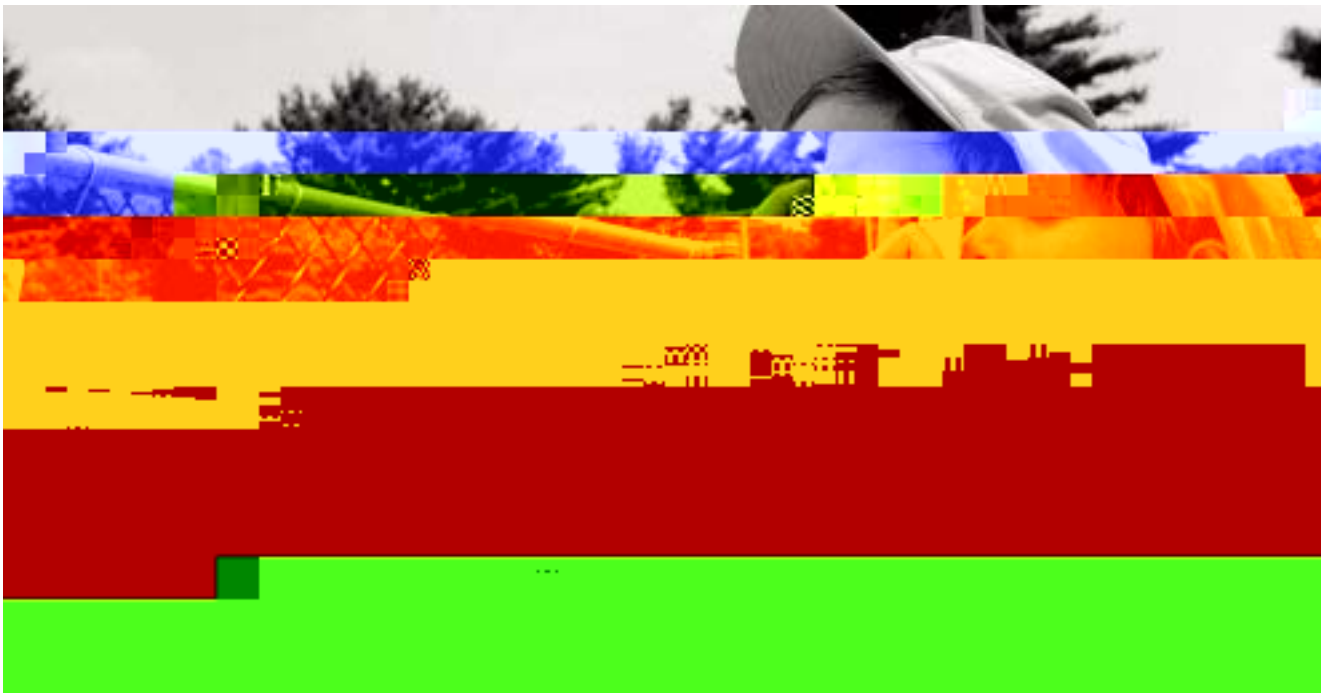
a step backward from simply enforcing current law.

Many of the administration's proposals to weaken clean air laws are just that – proposals and not yet law. The American people have the opportunity to shape those proposals by letting the administration know that we need stronger, not weaker, clean air protections.

The results of this report, which are available on Clear the Air's interactive website, empower individual citizens to tell the story of how power plant pollution affects them. Our work is designed to cut through the spin and reinvigorate the national debate.

If there was ever a time for people to stand up and demand action, it is now.

Angela Ledford
Director, Clear The Air
June 2004

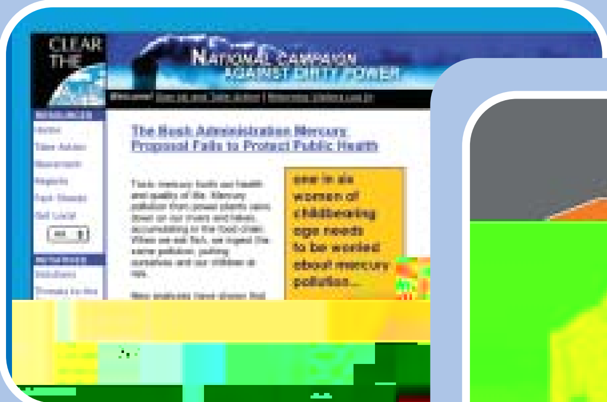


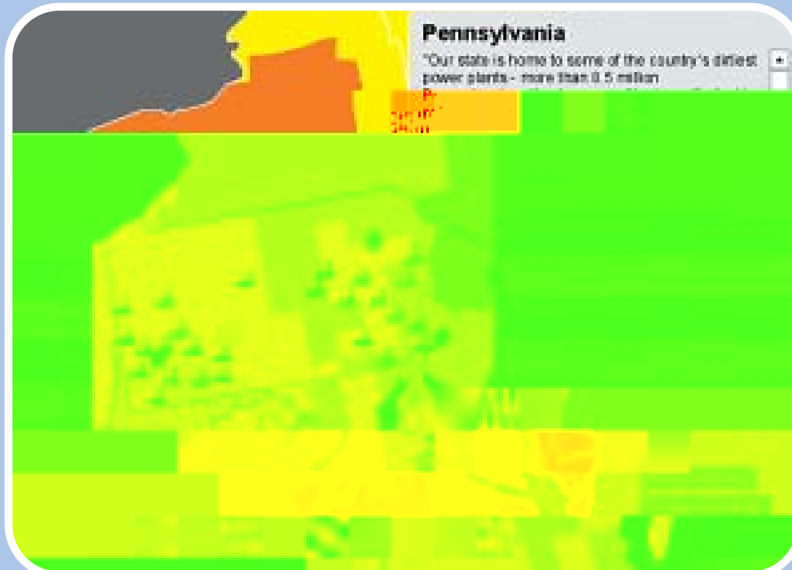
For more than thirty years, the oldest, dirtiest coal-burning power plants have circumvented air emissions standards required of modern power plants. As a result, these "grandfathered" power plants are permitted to emit more than 10 times more nitrogen oxides and sulfur dioxide than modern coal plants. The Bush administration's administrative rollbacks of New Source Review and the statutory rollbacks embodied in its proposed legislation would continue this lethal legacy. Polluting coal-fired plants must be made to comply with modern emission control standards. In addition, the nation's power fleet should be held to stringent caps on all four key power plant pollutants, including nitrogen oxides, sulfur dioxide, mercury, and carbon dioxide.

Requirements such as these can ensure that U.S. energy policy better accounts for the public health and environmental costs associated with electricity production and will propel us toward a more sustainable energy future.

Hundreds of thousands of Americans suffer each year from asthma attacks, cardiac problems, and respiratory problems associated with fine particles from power plants.

Your Air On the Web





- The problem of power plant pollution in your state or metropolitan area;
- The extent to which the Bush plan falls short of current law; and
- How proposals to strengthen the Clean Air Act can improve health in your community.

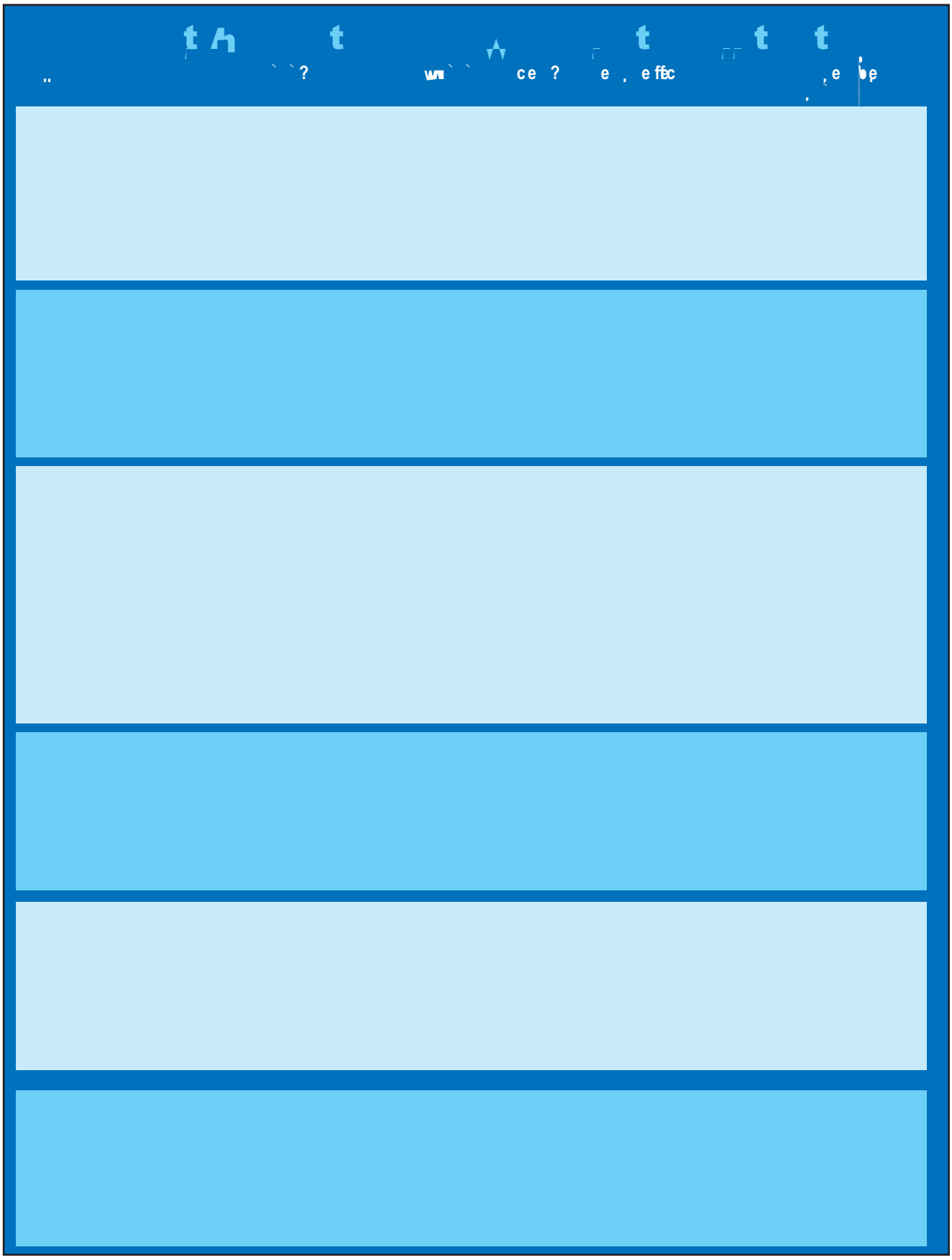
The Problem: Power Plants

Despite progress over the last decade, Americans are still suffering from the adverse health effects of air pollution. Over the past few decades, medical researchers examining air pollution and public health have shown that air pollution is associated with a host of serious adverse human health effects, including asthma attacks, heart attacks, hospital admissions, and premature death.[1] The adverse health consequences of breathing air pollution caused by emissions from utility power plants are severe and well documented in the published medical and scientific literature.[2]

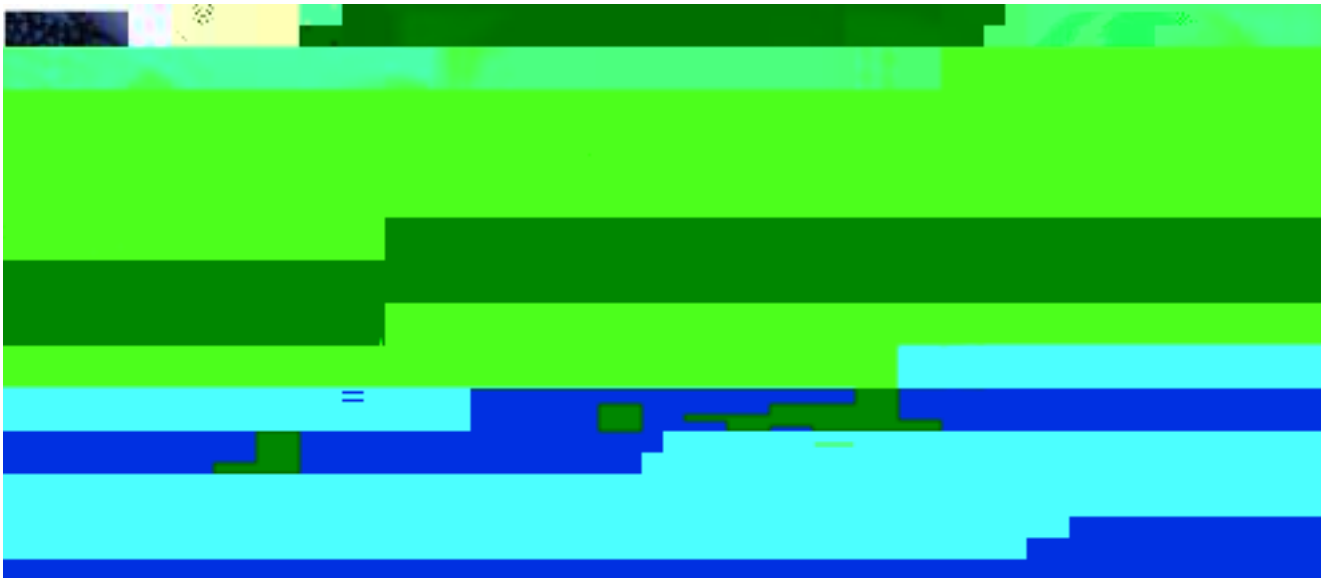
One of the air pollutants most carefully studied in the last decade is fine particles. Fine particles, such as those that result from power plant emissions, can bypass the defensive mechanisms of the lung and become lodged deep in the lung where they can cause a variety of health problems. Indeed, the latest evidence indicates that short-term exposure not only causes respiratory damage, but also causes cardiac effects, including increasing the risk of heart attacks.[3] Moreover, long-term exposure to fine particles increases the risk of cardiac, respiratory, and lung cancer death and has been estimated to shorten life expectancies of people living in the most polluted cities relative to those living in cleaner cities.[4] The average number of life-years lost by individuals dying prematurely from exposure to particulate matter is 14 years.[5] Moreover, in 2003 researchers documented fine particle-related mortality at low concentrations demonstrating that there is no lower threshold for premature death from the long-term inhalation of particles.[6]

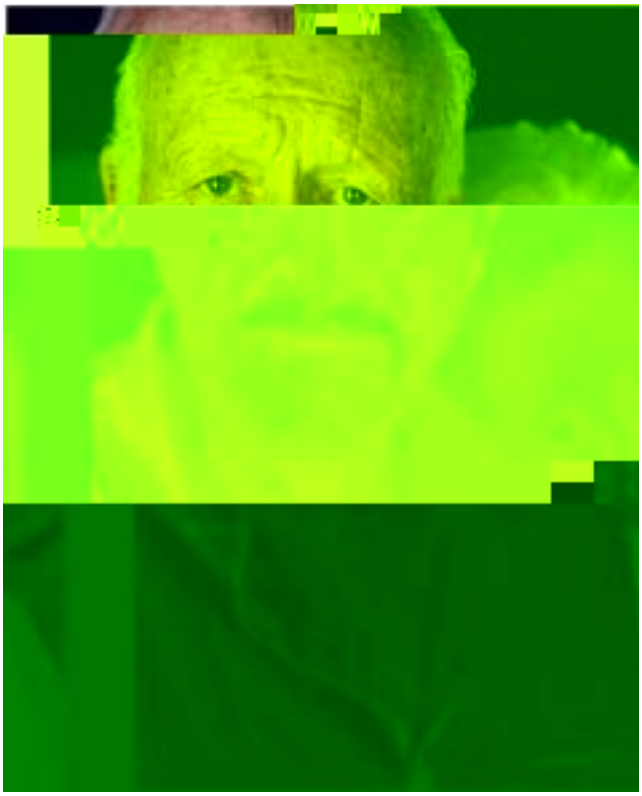
What is it?

Fine particles are a mixture of harmful pollutants (e.g. soot, acid droplets, metals) that originate primarily from combustion sources such as power plants, diesel trucks, buses, and cars. In 1997 EPA set national health standards for fine particles (referred to EPA as "PM2.5" or particulate matter smaller than 2.5 microns – 2.5 millionths of a meter in diameter – less than one-hundredth the width of a human hair and smaller). Fine particles are either soot emitted directly from these combustion sources or formed in the atmosphere from power plant sulfur dioxide (SO2) or nitrogen oxides (NOx) emissions. Among airborne particles, the smallest (fine) combustion particles are of gravest concern because they are so tiny that they can be inhaled deeply and be absorbed into the bloodstream, thus evading the human lung's natural defenses.

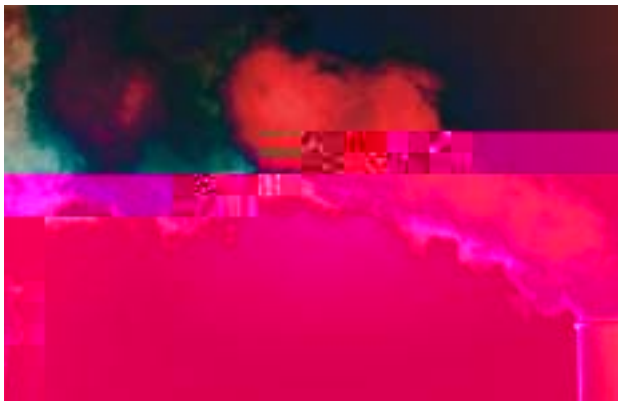


The state of the science on fine particles and health has undergone thorough review, as reflected in the recently updated U.S. Environmental Protection Agency (EPA) Criteria Document for Particulate Matter.[7] Since EPA set the fine particle standard in 1997, hundreds of new published studies, taken together, robustly confirm the relationship between fine particle pollution and severe adverse human health effects. In addition, the new research has provided plausible biological mechanisms for the serious impacts associated with fine particle exposure.[8]





While all of us are at risk from exposure to power plant pollution, the elderly, people with lung and heart disease, and children are at greatest risk. Young children need healthy lungs to play, learn, and grow into strong adults. School-age kids find participating in sports and even studying difficult when battling respiratory problems such as asthma. Studies estimate that tens of thousands of elderly people die each year from existing levels of fine particle pollution from power plants and other sources.[9] These fine particles are also associated with tens of thousands of hospital admissions annually.[10] Many of these involve elderly people already suffering from lung or heart disease. Respiratory ailments can rob the elderly of the full enjoyment of their sunset years.



New Findings

In 2000, Abt Associates issued a study commissioned by the Clean Air Task Force for Clear the Air quantifying for the first time the deaths and other health effects attributable solely to the fine particles from power plants. That study tracked the methodology approved at that time by EPA's Science Advisory Board and used by EPA in a variety of regulatory applications. Since that analysis, many additional studies linking fine particles to adverse health effects have been published in peer-reviewed journals. Several studies identified additional associated effects, such as lung cancer deaths, stroke,[25] non-fatal heart attacks,[26] and infant death /Sudden Infant Death Syndrome (SIDS).[27] Also, EPA has updated its methodology, refining the computer models it uses to quantify the benefits of pollution controls. The updated methodology has been reviewed and approved by the National Academy of Sciences. EPA used this updated methodology in estimating the benefits of the Bush administration's proposed power plant legislation.[28]

Moreover, since 2000, the Bush administration and Congress have proposed several new power plant clean up policies.[29] The Clean Air Task Force on behalf of Clear the Air commissioned Abt Associates to reflect the most recent science and compare the benefits of the various competing policy proposals.

This report, "Power Plant Emissions: Particulate Matter-Related Health Damages and the Benefits of Alternative Emission Reduction Scenarios,"[30] finds that nearly 24,000 deaths each year are attributable to fine particle pollution from U.S. power plants. The average number of life-years lost by individuals dying prematurely from exposure to particulate matter is 14 years.[31] Further, the study finds that 22,000 of these

Mortality	23,600
Hospital Admissions	21,850
Emergency Room Visits for Asthma	26,000
Heart Attacks	38,200
Chronic Bronchitis	16,200
Asthma Attacks	554,000
Lost Work Days	3,186,000

R	St	M t t	H s t A ss s	H t A t s
1	Pennsylvania	1,825	1,664	3,329
2	Ohio	1,743	1,638	2,873
3	Florida	1,416	1,367	2,145
4	Illinois	1,356	1,333	2,361
5	New York	1,212	1,191	2,455
6	Texas	1,160	1,105	1,791
7	North Carolina	1,133	1,013	1,603
8	Virginia	989	895	1,421
9	Michigan	981	968	1,728
10	Tennessee	952	804	1,276
11	Georgia	946	837	1,352
12	Indiana	887	845	1,491
13	Missouri	754	699	1,237

By modeling the impact of power plant pollution throughout the lower 48 states, Abt Associates developed health impact estimates for every state and major metropolitan area. Not surprisingly, states with large populations in close proximity to many coal-fired power plants fared the worst.

Conversely, states with large populations but without coal-fired power plants fared much better. For example, California, which has the nation's largest population and some of its worst air quality, has few coal or oil-fired plants. Abt Associates estimates that only 249 deaths are attributable to power plant pollution in California, and the state ranked 46th in per capita impact (number of deaths per 100,000 adults). West Virginia, a state heavily reliant on coal for electricity production, ranked first in related per capita mortality with more than 33 deaths per 100,000 adults, or more than 25 times higher than California's per capita mortality rate.

Similarly, metropolitan areas with large populations in relative proximity to coal-fired plants feel their impacts most acutely. In such large metropolitan areas, many hundreds of lives are shortened each year.

However, much smaller metropolitan areas in and around "coal country," such as Wheeling, West Virginia; Steubenville, Ohio; Cumberland, Maryland; and Johnstown, Pennsylvania, suffer the greatest per capita impacts. Their death rates are much higher, for example, than that of New York City. For instance, the mortality rate from power plant pollution is 35 deaths per 100,000 adults in Pittsburgh, Pennsylvania compared with nine per 100,000 in New York City.

In fact, because these health effects estimates include only the effects from airborne fine particles, they sig-

R	M t A	M t t	H s t A ss s	H t A tt s
1	New York, NY	1,002	1,008	2,098
2	Chicago, IL	855	848	1,519
3	Pittsburgh, PA	563	506	990
4	Philadelphia, PA	559	505	1,007
5	Washington, DC	515	524	851
6	Detroit, MI	446	439	783
7	Atlanta, GA	436	409	672
8	St. Louis, MO	368	339	599
9	Baltimore, MD	357	311	496
10	Cincinnati, OH	319	300	5176New Yo-1.3333 T

Mindful of these concerns, in 1999, Senators James Jeffords (I-VT), Joseph Lieberman (D-CT), and Susan Collins (R-ME) and Representatives Henry Waxman (D-CA) and Sherwood Boehlert (R-NY) introduced aggressive multi-pollutant legislation that would set stringent caps on nitrogen oxides, sulfur dioxide, mercury, and carbon dioxide within a decade. The "Jeffords bill" would set plant-by-plant mercury emissions limits and contains a "birthday" provision that would require plants to install modern pollution controls for nitrogen oxides and sulfur dioxide by a plant's 40th birthday. The Jeffords bill also would begin a serious effort to reduce carbon by capping power sector carbon dioxide emissions at 1990 levels.[48]

The public's support for power plant clean up grew over time and as a candidate for the presidency in the year 2000, George W. Bush pledged support for legislation to reduce significantly all four power plant pollutants.[49] W

[illegible]

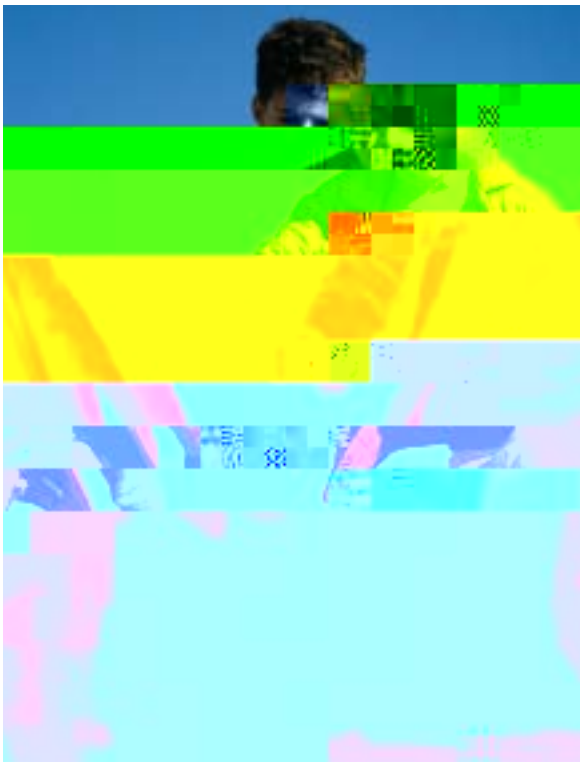
	N O (NOx)	S D (SO2)	M (Hg)	C D (CO2)	N S R	E CAA P
J L C P S.366	1.51 million ton cap by 2009	2.255 million ton cap by 2009	5 ton cap by 2009. Each plant limited to 2.48 grams of mercury per 1000 megawatt hours, or less as determined by EPA	2.05 billion ton cap by 2009	No Change to existing law	No changes to visibility or air toxics sections of existing law
B C S S.485	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	34 tons per year by 2010 (trading allowed) 15 tons per year by 2018. Sources can avoid emission reductions through mercury emission credit trades	No limit on CO2 emissions	Would practically eliminate new source review for new and existing power plants	Would eliminate visibility and interstate air pollution protections, delay attainment of NAAQS and repeal power plant air toxics controls
C /G C A P S.843	1.87 million ton cap by 2009 1.7 million ton cap by 2013	4.5 million ton cap by 2009 3.5 million ton cap by 2013 2.25 million tons by 2016	24 tons by 2009 10 tons by 2013 Each unit must cut emissions to 50% of the mercury in delivered coal by 2009 and 70% of Hg in coal by 2013, or meet an alternative output emission rate. Limited mercury emission trading and banking is allowed	Power plant emissions capped at year 2006 level for calendar years 2009-2012 Power plant emissions capped at year 2001 level by 2013 and beyond	Retains NSR for new plants, but eliminates offsets for new sources with reductions from other sources; also limits cost of new source controls Performance standards for all plants in 2020 of 4.5 lbs/MWh SO2 and 2.5 lbs/MWh NOx	Would eliminate the requirement for a Mercury MACT standard for power plants Would grant a 20 year exemption from BART requirements in the visibility provisions of existing S169A
EPA 2001 P	1.87 million ton cap by 2008 1.25 million ton cap by 2012	2 million ton cap by 2010	24 ton cap by 2008 7.5 ton cap and a 70% facility-specific reduction requirement by 2012	No limit on CO2 emissions	Would repeal new source review for existing power plants	Would replace nearly every CAA program applicable to power plants except NAAQS
P Q R B A R T (BART) R M R	2.4 million ton cap by 2010 2.1 million ton cap by 2015	4.6 million ton cap by 2010 3.5 million ton cap by 2015	MACT proposal: 34 tons by 2008 Section 112(n) trading alternative: 34 tons by 2010 Section 111 cap and trade alternative: 34 tons by 2010 and 15 tons by 2018	No limit on CO2 emissions	Final rule may include NSR rollbacks	N/A

To date, neither the Jeffords bill nor Bush's bill has been able to garner sufficient support for passage. Seeking to break this gridlock, Senator Tom Carper (D-DE), along with Senators Lincoln Chafee (R-RI), Lamar Alexander (R-TN), and Judd Gregg (R-NH) in 2003 introduced alternative legislation that "splits the difference" between the Jeffords and Bush proposals. On the one hand, the caps in the Carper bill are not as stringent as those in the Straw or Jeffords proposals. On the other hand, the Carper bill contains only partial rollbacks of the current Clean Air Act, as compared with the Bush plan, but still repeals the New Source Review program as it applies to existing plants, weakens technology standards for new plants, repeals the program designed to reduce toxic mercury pollution from each and every power plant, and delays the implementation of rules to protect national park visibility.[53]

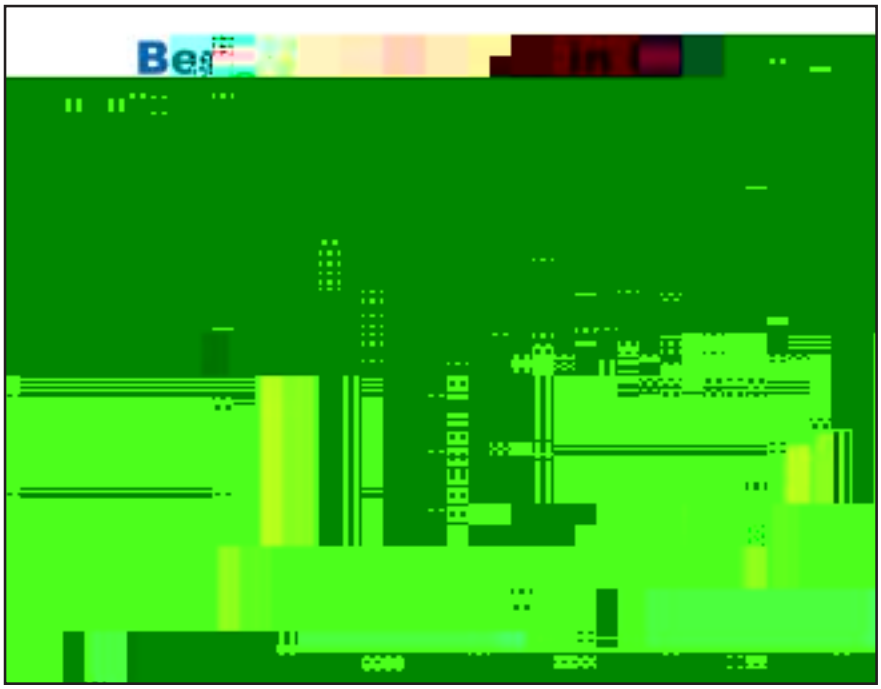
In the absence of legislative action on its proposal, EPA has proposed regulations to implement similar caps administratively. The "Interstate Air Quality Rule" (IAQR) would cap the emissions of power plant nitrogen oxides and sulfur dioxide in the eastern U.S. at levels comparable to those proposed in the Bush bill.[54] EPA also proposed a rule in 2004 to review and update emissions controls on old power plants throughout the U.S. in an effort to cut air pollution that causes the haze that impairs scenic vistas in our national parks. This rule would effectively extend the proposed IAQR cap to the entire nation.[55] Lastly, EPA has proposed a power plant mercury rule that would require no more overall mercury

Recent policy analyses have quantified some of the potential health benefits of cleaning up emissions of sulfur dioxide and nitrogen oxides from the nation's fossil-fuel power plants. These analyses generally rely on methodology prescribed by U.S. EPA's Science Advisory Board (SAB) for quantifying the benefits of air regulatory actions in Regulatory Impact Analyses and in the prospective and retrospective studies of benefits of the Clean Air Act. For example, using this methodology, EPA estimated that attainment of the National Ambient Air Quality Standard (NAAQS) for fine particulate matter would avoid more than 15,000 premature deaths per year and hundreds of thousands of asthma attacks.[57] For purposes of cost-benefit analysis, these benefits can be monetized. When the Bush administration introduced its power plant legislation in Congress, EPA released a benefits analysis of the bill using the SAB methodology.[58] This type of analysis can be used to compare the benefits of the various power plant clean up proposals.

Now, for the first time, the Clean Air Task Force and Abt Associates, using EPA's SAB-approved methodology and the identical modeling platforms used by EPA in calculating the benefits of the Administration's bill, have tallied the relative benefits of EPA's original 2001 proposal, the Jeffords bill, and the Carper bill in order to compare them to the benefits of the Bush bill. The benefits of each bill in avoided premature deaths per year are summarized in the bar chart at right.



By 2020, the Jeffords bill would save 100,000 more lives than the Bush administration's bill.



With its tighter caps and faster implementation, the bipartisan proposal to strengthen the Clean Air Act (Jeffords bill) virtually eliminates the health impacts from power plants. For example, the Jeffords bill would avoid 22,000 of the 24,000 total power plant-related deaths per year. By 2020, the Jeffords bill would save 100,000 more lives than the Bush administration's bill and 8,000 more lives every year thereafter. Moreover, the Bush plan would mean 4,000 more deaths in 2020 than would be saved each year by faithful implementation of the requirements of the Clean Air Act applicable to power plants.

The maps on these pages illustrate the risk of mortality (deaths per 100,000 adults) nationwide under each bill.

As can be seen from these maps, the areas of greatest per capita risk from power plant pollution come in areas with heavy concentrations of coal-fired power plants. The Jeffords bill would virtually eliminate this risk, while the Bush plan would cut that risk by less than half in the most heavily-polluted areas.

As a first step in determining the emissions under each plan, the SAB-approved methodology begins by running a power system economic model (the

Likewise, Clean Air Task Force commissioned ICF Consulting as part of this report to use the IPM model, exactly as EPA specified the model in its "Clear Skies" modeling runs, to estimate the power system response to each of the competing scenarios examined in this report: the Jeffords bill, EPA's 2001 proposal, and the Carper bill. ICF also provided us with cost estimates for each of these proposals.

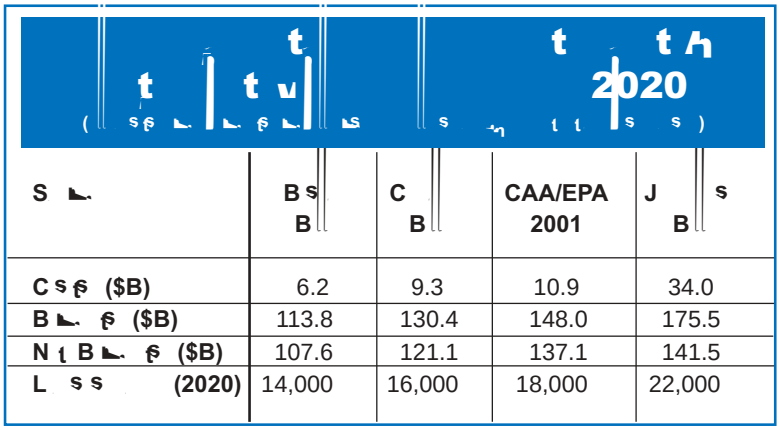
The cost estimates here of a proposal, such as the Jeffords bill, that leaves the underlying requirements of the Clean Air Act intact are greatly overstated because they attribute the full cost of the pollution reductions to the bills themselves when faithful implementation of the Clean Air Act also would reduce pollution – and increase costs. The cost of the Jeffords bill, then, would most accurately be reflected by the difference between the cost of faithful implementation of the Clean Air Act and the incremental additional cost of strengthening the Act as proposed in the Jeffords bill. Secondly, the IPM model assumptions used by EPA to gauge the costs of the Bush administration's bill fail to include a "demand response" function. We know that in the real world as electricity prices rise, people will tend to use less electricity. That is, as price rises, demand is curtailed by some amount. If, as a result of a reduction in demand, less electricity is needed and less is produced, this results in a lower total cost of electricity production than would otherwise be the case. IPM as specified by EPA fails to account for this effect and thus overstates the cost of power plant clean up policies that increase electricity prices.

Moreover, different cost models yield different outcomes even when evaluating the same policy scenarios. For example, the Energy Information Administration's recent modeling of the Bush bill

yielded different results than EPA's IPM analysis.[59] Nevertheless, the IPM model does provide a basis to estimate the relative costs of the competing policy scenarios to each other and allows us to add an estimate of cost to a cost-benefit comparison of the scenarios.

The table below displays the relative costs and benefits of each of the four proposals.

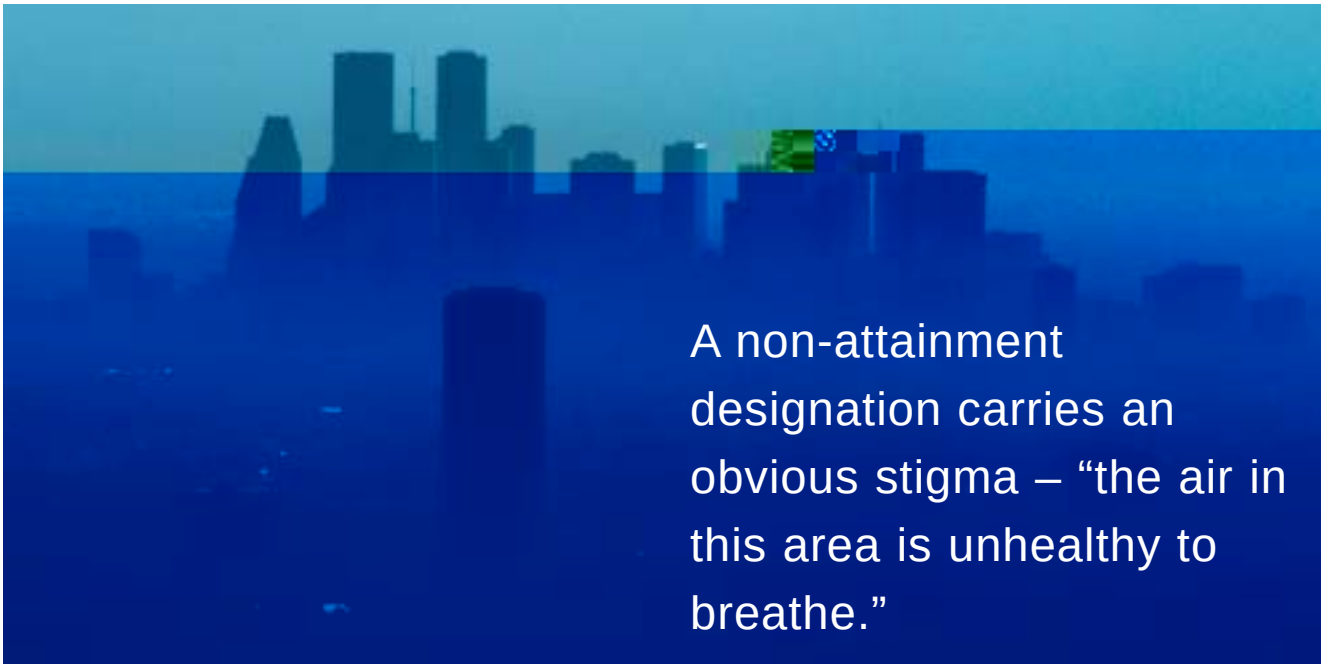
EPA is under a standing Executive Order to choose among regulatory and policy alternatives that result in the greatest net benefits (i.e., benefits – costs = net benefits).[60] According to EPA's own benefits methodology, all of the competing proposals yield greater net benefits than the Bush bill. Indeed, the Jeffords bill yields the greatest net benefits of all the proposals.



S	B s B	C B	CAA/EPA 2001	J s B
C s ($B)	6.2	9.3	10.9	34.0
B ($B)	113.8	130.4	148.0	175.5
N t B ($B)	107.6	121.1	137.1	141.5
L s s (2020)	14,000	16,000	18,000	22,000

While we have fundamental concerns about attempting to reduce human death, illness, and misery into dollars, it is important to note the monetized health costs the administration's proposal would impose on the public. In the year 2020, the original EPA 2001 proposal (i.e., the scenario consistent with the requirements of current law) would cost industry $4.7 billion dollars more to implement than the Administration's bill. However, in the same year, the original EPA proposal would produce $34 billion in additional benefits beyond those expected from the Bush administration's bill due to additional reductions in premature death and disease. The White House chose a plan that would inflict an additional $34 billion a year in health damages on the public in order to save power plant owners $4.7 billion in compliance costs. In choosing to weaken the Clean Air Act via its bill, the Bush administration would allow the power industry to continue to stick the American people with $34 billion per year in health damages, who bear that cost in the form of preventable disease and death.

Finally, the Jeffords bill, because of its stringent provisions and timetable that strengthen the Clean Air Act, would eliminate nearly 90 percent of all power plant-related deaths and other health effects, in addition to requiring significant cuts in mercury and carbon dioxide (consistent with the 1992 Rio Treaty on climate change). Indeed, in 2020 for a total of $34 billion in cost, the Jeffords bill would yield total health benefits of $175 billion per year ($60 billion more per year than the Bush administration's bill) and avoid nearly 22,000 premature deaths per year.



A non-attainment designation carries an obvious stigma – "the air in this area is unhealthy to breathe."

tt t t

In December 2004, EPA will propose the designation for the first time of hundreds of counties as out of attainment with national ambient air quality standard for fine particles originally promulgated in 1997.[61] Under the Clean Air Act, these areas are required to achieve attainment by 2010.[62] The designations will be based on air quality measurements from a network of monitors located in certain counties around the country.[63]

Nonattainment status presents serious concerns for a community. First and foremost, nonattainment designation is an official declaration that the air fails to meet federal health standards. Such a classification carries an obvious stigma – "the air in this area is unhealthy to breathe." For emissions sources within the area, such as local businesses and vehicles, nonattainment can mean paying the cost of pollution controls to reduce pollution produced in the area. Moreover, because the law requires new emission sources within a nonattainment area to offset their emissions so that they do not add to the problem, nonattainment can present an obstacle to business development. Areas branded nonattainment usually seek to achieve attainment status as quickly as possible for the least cost – both monetary and political.

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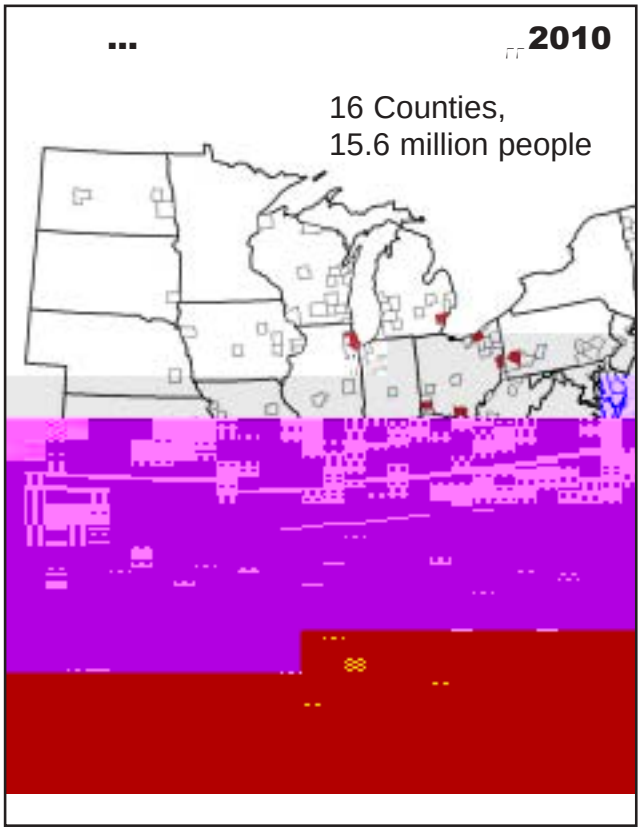
(2.) t h t 2010

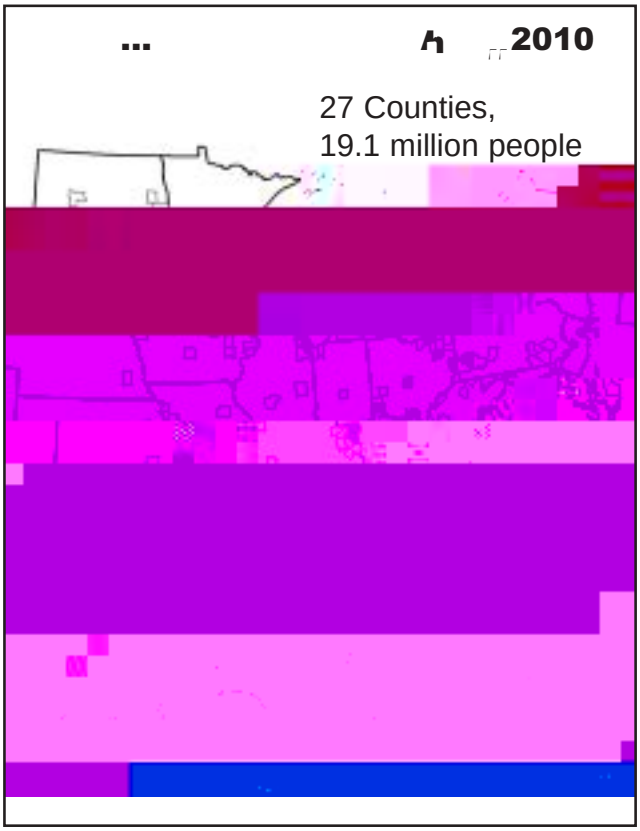
S	B s 2010	B s B	C B	CAA/EPA 2001	J B s
N C s	69	27	16	13	5
P t (s)	32.7	19.1	15.6	14	10.3

As part of its benefits analysis of the Administration's bill, EPA used modeling analysis to predict the counties that would attain the standard under its caps. Using EPA's methodology, Abt Associates was able to replicate that analysis for each of the com-

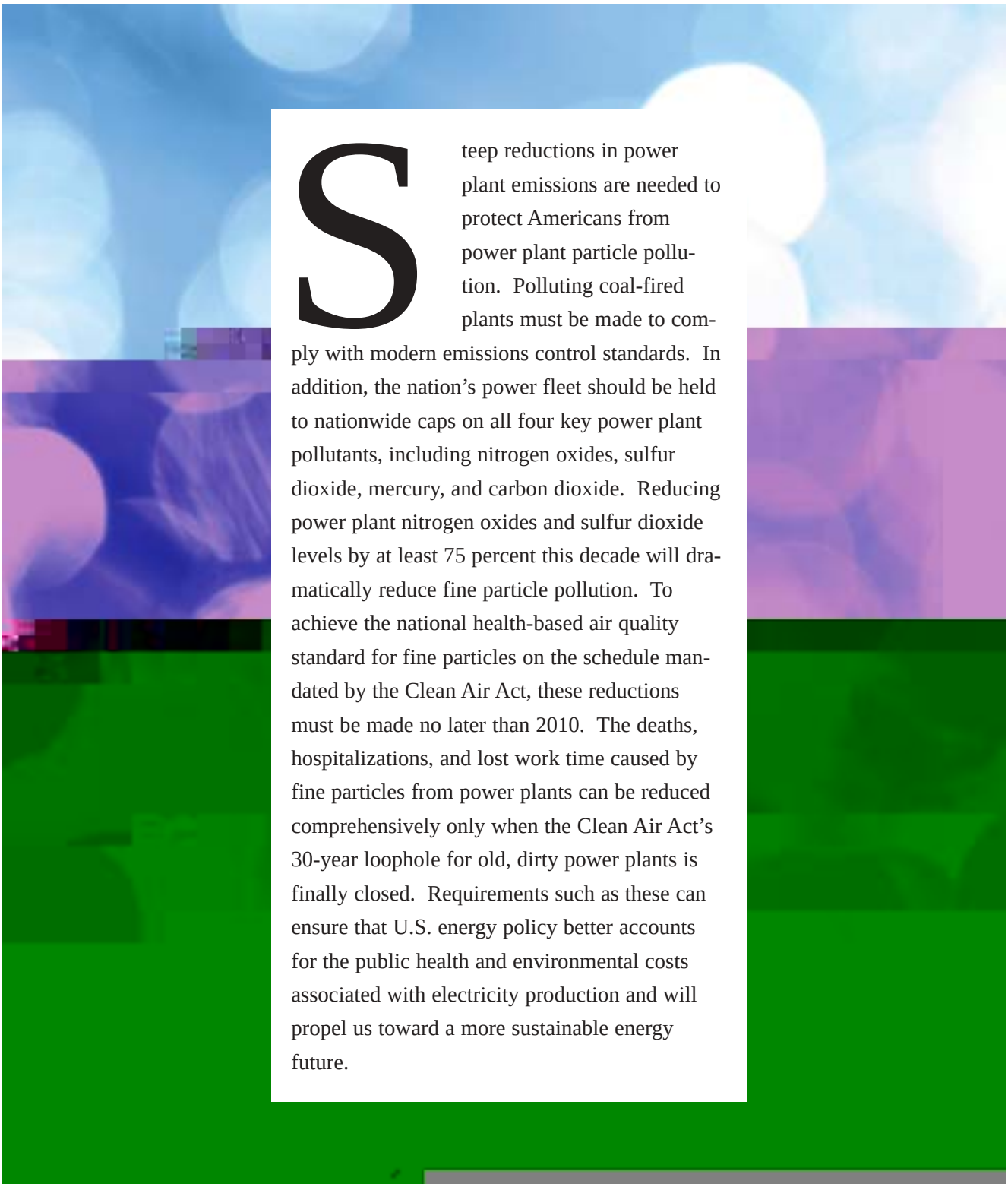
peting power plant clean up proposals. Under the Jeffords bill in the eastern U.S. by 2010, all but five counties would achieve attainment. By contrast, under the Bush plan, 27 eastern counties, home to more than 19 million people, would still be

In sum, the Jeffords bill yields more tons reduced, more lives saved, more adverse health effects avoided.





It's Time To Clear The Air



Steep reductions in power plant emissions are needed to protect Americans from power plant particle pollution. Polluting coal-fired plants must be made to comply with modern emissions control standards. In addition, the nation's power fleet should be held to nationwide caps on all four key power plant pollutants, including nitrogen oxides, sulfur dioxide, mercury, and carbon dioxide. Reducing power plant nitrogen oxides and sulfur dioxide levels by at least 75 percent this decade will dramatically reduce fine particle pollution. To achieve the national health-based air quality standard for fine particles on the schedule mandated by the Clean Air Act, these reductions must be made no later than 2010. The deaths, hospitalizations, and lost work time caused by fine particles from power plants can be reduced comprehensively only when the Clean Air Act's 30-year loophole for old, dirty power plants is finally closed. Requirements such as these can ensure that U.S. energy policy better accounts for the public health and environmental costs associated with electricity production and will propel us toward a more sustainable energy future.

This type of analysis uses risk assessment methods to attribute mortality and morbidity impacts to groups of pollution sources such as power plants. It rests on the idea that if a pollutant has health effects at current levels (above any threshold), then an incremental reduction will have an incremental public health benefit. The methodology typically involves modeling the economic response of the electric power system to the imposition of costs of pollution reduction, modeling the air quality concentration changes from the pollution controls, and relating those air quality changes to changes in human exposure and expected changes in specific health effects across the population, based on the risk factors found in the scientific literature.

The Clean Air Task Force commissioned Abt Associates, the consulting firm relied upon by U.S. EPA to assess the health benefits of many of the agency's air regulatory programs, to quantify the benefits of each of the respective clean up scenarios. The objective of the study was to quantify the expected health benefits (avoidable premature deaths, hospitalizations, etc.) of each of the scenarios. The health endpoints analyzed included death, lung cancer deaths, hospitalizations, emergency room visits, asthma attacks, and a variety of lesser symptoms.

To analyze the avoidable health impacts of fine particles based on the alternative policy scenarios, the Clean Air Task Force asked Abt Associates to run

available and provides critical information on the spatial distribution of power plant emissions before and after clean up. ICF Consulting, EPA's power system modeling consultant, ran its Integrated Planning Model (IPM) to determine the production costs and the spatial distribution of emissions under the various scenarios. In running the model, ICF Consulting used inputs and assumptions consistent with EPA's "Clear Skies" modeling analysis.

The cost estimates of the Carper bill do not include estimates of the costs of carbon dioxide provision calculated by EPA exogenously from the IPM model based on carbon dioxide supply curves of off-system carbon reduction options.[64]

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The outputs from the IPM model provide the power plant emissions inputs to the air quality modeling work performed by Pechan and DynTel. First, they assembled the emissions inventory for all non-power plant sources of NOx, SO2, and direct particulate emissions. Using the power plant emissions inputs from ICF Consulting, Pechan and DynTel ran EPA's PM air quality model Regional Emission Modeling System for Acidic Deposition (REMSAD) (approved by EPA's Science Advisory Board). The REMSAD model was used to estimate the baseline fine particle contributions attributable to the power plants and the reductions in pollutant concentrations due to the targeted reductions in each clean up scenario. The inputs and assumptions used by Pechan and DynTel are consistent with the identical analysis run for the "Clear Skies" proposal.[65] The health effects estimates reported here are based on the REMSAD modeling outputs.

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The air pollution concentration outputs from Pechan and DynTel's air quality analysis provide the inputs for Abt Associates' health effects modeling. Using health effects studies described above that link changes in ambient fine particle concentrations to changes in risk of mortality and morbidity, pollution concentration-response functions were derived that quantify the relationship between the forecasted changes in exposure and the expected changes in specific health effects. Abt Associates then used the modeled changes in pollutant concentrations (from the base case to each of the emission reduction scenarios) to estimate the power plant-attributable health impacts from each. The difference between the base case and the emission reduction scenario yielded estimates of the health benefits, i.e. avoided adverse impacts.

Once the avoidable health impacts were determined, the monetary values of each of the various health endpoints was estimated through economic valuation techniques previously used in EPA's "Clear Skies" analysis. Given the attributable and avoided health impacts calculated, Abt Associates tallied the health damages – from lost work and cost of emergency room care, to the statistical value of human lives lost from power plant emissions – and estimated the benefits of the health endpoints avoided under each clean up scenario.

Alabama	404	471	535	599
Arizona	24	34	43	64
Arkansas	220	243	285	365
California	54	67	93	124
Colorado	39	51	75	119
Connecticut	141	162	181	198

1	New York, NY	680	764	842	915
2	Chicago, IL	471	518	606	825
3	Pittsburgh, PA	327	370	406	453
4	Philadelphia, PA	388	432	472	514
5	Washington, DC	382	428	467	513
6	Detroit, MI	251	284	337	404
7	Atlanta, GA	327	363	407	457
8	St. Louis, MO	201	230	264	336
9	Baltimore, MD	265	294	319	348
10	Cincinnati, OH	198	226	254	287
11					

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28. Technical Addendum: Methodologies for the Benefit

59. For example, a report by the Energy Information Administration compared the costs of "Clear Skies" using EIA's model vs. the IPM model. SR/OIAF/2003-03 Analysis of S. 485, the Clear Skies Act of 2003, and S. 843, the Clean Air Planning Act of 2003 September 2003 Energy Information Administration Office of Integrated Analysis and Forecasting, U.S. Department of Energy Washington, DC 20585SR/OIAF/2003-03 at pps. 43-44.

60. Executive Order 12866 requires that "in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach." Regulatory Planning and Review 58 Federal Register 51735, Executive Order 12866, (September 30, 1993). Available online at: http://www.epa.gov/fedrgstr/eo/eo12866.htm

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62. 42 U.S.C. §172(a)(2).

63. See http://www.epa.gov/ttn/amtic/datasrc.html

64. U.S. EPA, S. 3135, The Clean Air Planning Act of 2002, Presentation for Jeff Holmstead, November 2002 available online at: http://www.catf.us/publications/other/Carter_EPA_Presentation_November_19_2002.pdf. For this report, ICF Consulting modeled only the Carper bill's nitrogen oxides, sulfur dioxide, and mercury provisions. According to the EPA's analysis, the bill's carbon dioxide requirements would add negligible additional cost to the bill due to the wide availability of inexpensive offsets from non-power plant sources.

65. Technical Addendum: Methodologies for the Benefit Analysis of the Clear Skies Act of 2003. Available online at http://www.epa.gov/air/clearskies/tech_addendum.pdf.


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