



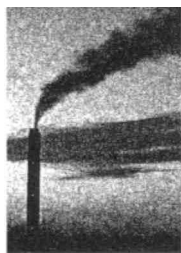
A Clear The Air Report

Power to Kill

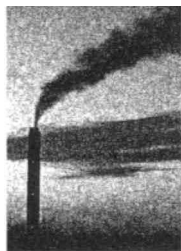


Death and Disease from Power Plants Charged with Violating the Clean Air Act

Prepared by



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SUMMARY

There are more than 500 major coal-fired power plants in the U.S. today, and the vast majority are decades old. Because of a "grandfathering" loophole in the Clean Air Act, these oldest, dirtiest plants have been able to avoid modern pollution controls. This loophole was granted because it was expected that these old plants would retire and be replaced by cleaner new plants, and therefore should not be made to meet modern standards. But an important limitation was placed on this loophole to keep it from being abused. To limit this loophole, a key provision of the Clean Air Act known as "New Source Review" or "NSR" was created. New Source Review requires the plant owners to upgrade their pollution controls to modern standards whenever they make modifications that extend the life of the plants and significantly increase their emissions.

In the last ten years, however, it has become clear that all too often this did not happen. In the 1990s, the United States Environmental Protection Agency (EPA) and the U.S. Department of Justice began to investigate electric power producers for violations of New Source Review. The investigation showed that for years many plant owners had been making major capital investments, extending the lives of their plants while increasing pollution without upgrading pollution controls — all in clear violation of the Clean Air Act. To date, the federal government, several states and certain environmental groups have brought enforcement actions against thirteen power companies for violations at 51 power plants in twelve states.¹

According to the Justice Department and EPA, the failure of the owners to install new emissions controls when they upgraded these plants has resulted in *tens of millions of tons of sulfur dioxide, nitrogen oxides, and particulate matter*.² These pollutants impact a broad area of the Midwest, Southeast, and Northeast United States, increasing airborne concentrations of fine particles³. These particles are associated with a variety of serious health impacts including increased asthma attacks and even premature death. However, the electric power industry has lobbied heavily to weaken New Source Review protections and stop the NSR enforcement actions.

Despite the high stakes for public health, the recently released Bush Energy Plan has thrown into doubt the future of efforts to curb these emissions. The White House has directed EPA to conduct a 90-day "review" of its NSR policy, and has told the Justice Department to review the statutory and regulatory basis for its enforcement actions.⁴

The Bush Administration's review of the NSR rules and enforcement cases has focused almost exclusively on industry's claim that the rules are onerous because they prevent them from making necessary repairs and upgrades to improve efficiency and reliability of their power plants. Incredibly, the review has completely ignored the very real public health protections provided by the NSR rules and the potential of the enforcement cases to deliver significant health benefits through large emission reductions from the plants.

The Death and Disease from the Plants Charged with NSR Violations

In this report, the Clean Air Task Force draws on data from a previous study by Abt Associates⁵ in order to quantify the death and disease from the power plants that have been charged with NSR violations. The report shows just how many premature deaths and asthma attacks are due to the fine particle pollution from these plants, and also estimates how many asthma attacks and deaths would be avoided each year if these plants were required to meet modern standards as a result of successful NSR enforcement.⁶

Key findings of this report include:

- Pollution from the 51 plants that are targets of NSR enforcement actions shortens the lives of, at a minimum, 5,500 people and as many as 9,000 people each year;
- Requiring these plants to meet modern pollution standards as required by law would avoid from 4,300 to 7,000 of these deaths;
- Pollution from the 51 NSR plants leads to between 107,000 and 170,000 asthma attacks each year;
- Between 80,000 and 120,000 of these asthma attacks could be avoided by requiring these plants to meet modern pollution standards as required by law;
- Although all of the plants that are current targets of NSR enforcement are located in the Midwest or Southeast, there is a "transport of death and disease". The pollution from these plants affects downwind states resulting in 1,500 to 2,100 premature deaths and 30,000 to 39,000 asthma attacks per year in the Northeast;⁷
- 1,200 to 1,700 of the deaths and 23,000 to 31,000 of the asthma attacks in downwind Northeastern states would be avoided if the plants met modern pollution standards;
- The pollution reductions from the announced settlements with Tampa Electric, Cinergy, Inc., and Dominion Power alone would result in avoiding 780 to 1,150 premature deaths per year;
- Requiring the 51 NSR plants to meet modern pollution standards would yield total estimated monetary benefits of \$24 to 38 billion per year.

THE LETHAL LOOPHOLE

When Congress enacted the Clean Air Act in 1970, and when the Act was amended in 1977, it required major new sources of pollution to use the best available pollution control technology.⁸ However, existing pollution sources, such as coal-fired power plants that were already online in 1977, were "grandfathered" under the Act and not required to meet modern pollution standards.

But in certain circumstances, "grandfathered" plants are treated under the Act as "new sources": when these plants make investments in replacing equipment or modernizing their facilities in a manner that extends their useful lives and causes significant increases in pollution, they legally become new sources and must upgrade their pollution controls.⁹

This is "New Source Review" or "NSR," and it lies at the heart of the Clean Air Act's public health protections. Without NSR, old power plants could continue spewing high levels of pollution into the air indefinitely rather than upgrading their pollution controls

or being replaced by newer, cleaner plants that must meet the most protective pollution standards.

When Congress originally passed the Clean Air Act, it never intended the grandfathered power plants to avoid modern pollution controls permanently. Instead, Congress provided that existing plants would have to install modern pollution controls when they are "modified". The "modification" rule allows plant owners to install pollution control measures when they are most cost-effective -- at the time the plant is already undergoing substantial renovation.¹⁰ Thus, Congress carefully balanced the plant owners' concerns about the cost of retrofitting existing plants with the need to protect public health by providing for the gradual clean up of older pollution sources. As the D.C. Circuit Court of Appeals has observed:

Implementation of the statute's definition of "modification" will undoubtedly prove inconvenient and costly to the affected industries; but the clear language of the statute unavoidably imposes these costs except for de minimis increases. The statutory scheme intends to "grandfather" existing sources; but the provisions concerning modifications indicate that this is not to constitute perpetual immunity

...¹¹

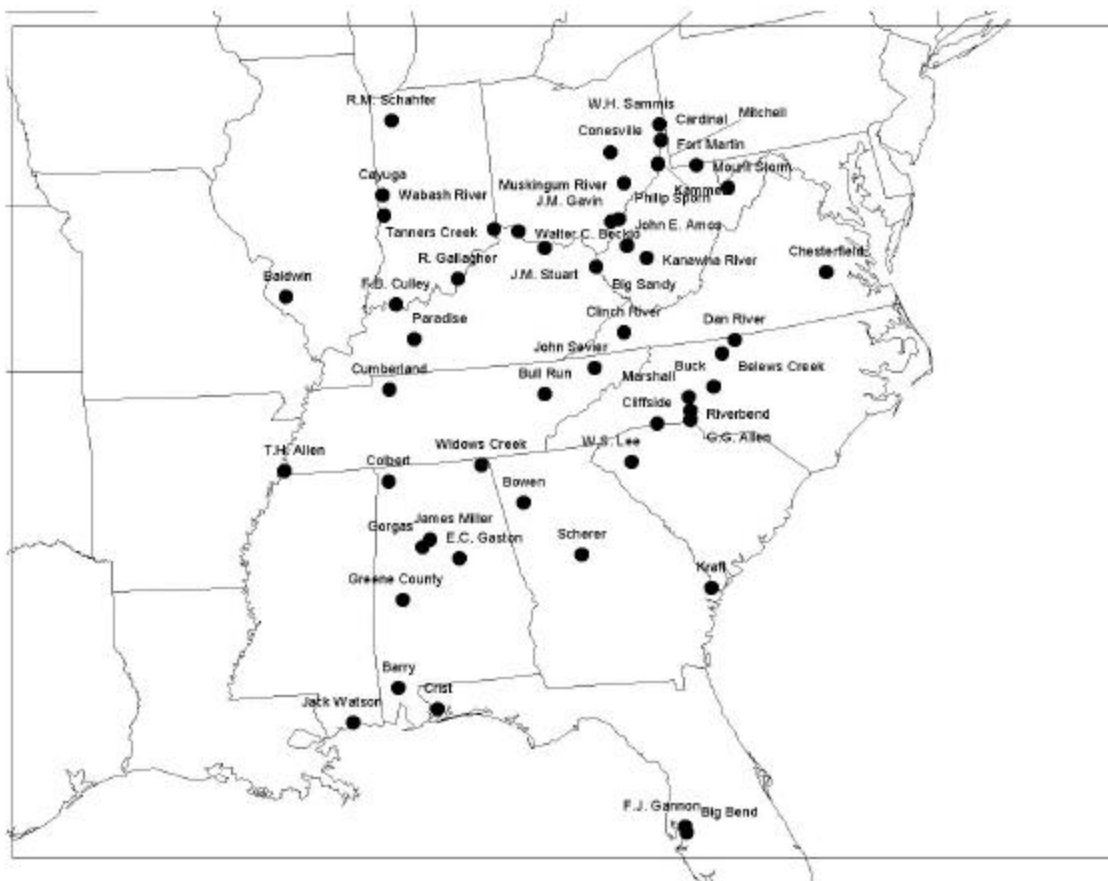


Figure 1: Power plants charged with violations of the Clean Air Act's New Source Review provisions. Plants are listed in Table 1 below.

Plant	Owner	City	State	Start Up Year
Big Sandy	AEP	Louisa	KY	1962
Cardinal	AEP	Brilliant	OH	1966
Clinch River	AEP	Cleveland	VA	1958
Conesville	AEP	Conesville	OH	1959
Gen J M Gavin	AEP	Cheshire	OH	1974
John E Amos	AEP	St. Albans	WV	1971
Kammer	AEP	Moundsville	WV	1958
Kanawha River	AEP	Glasgow	WV	1953
Mitchell	AEP	Moundsville	WV	1971
Muskingum River	AEP	Beverly	OH	1953
Phil Sporn	AEP	New Haven	WV	1949
Tanners Creek	AEP	Lawrenceburg	IN	1951
Fort Martin	Allegheny Power	Maidsville	WV	1967
Cayuga	Cinergy	Cayuga	IN	1970
R Gallagher	Cinergy	New Albany	IN	1958
Wabash River	Cinergy	Terre Haute	IN	1953
Walter C Beckjord	Cinergy	New Richmond	OH	1952
Chesterfield	Dominion	Chester	VA	1952
Mt Storm	Dominion	Mt. Storm	WV	1965
J M Stuart	DPL	Aberdeen	OH	1971
Belews Creek	Duke	Walnut Cove	NC	1974
Buck	Duke	Spencer	NC	1953
Cliffside	Duke	Cliffside	NC	1948
Dan River	Duke	Eden	NC	1949
G G Allen	Duke	Belmont	NC	1957
Marshall	Duke	Terrell	NC	1965
Riverbend	Duke	Mount Holly	NC	1954
W S Lee	Duke	Pelzer	SC	1951
Baldwin	Illinova	Baldwin	IL	1970
R M Schahfer	NIPSCO	Wheatfield	IN	1976
W H Sammis	Ohio Edison	Stratton	OH	1959
F B Culley	SigCorp	Newburgh	IN	1955
Barry	Southern Company	Barry	AL	1954
Bowen	Southern Company	Taylorville	GA	1971
Crist	Southern Company	Pensacola	FL	1961
E C Gaston	Southern Company	Wilsonville	AL	1960
Gorgas	Southern Company	Parrish	AL	1951
Greene County	Southern Company	Demopolis	AL	1965
Jack Watson	Southern Company	Gulfport	MS	1968
James H Miller Jr	Southern Company	Quinton	AL	1978
Kraft	Southern Company	Port Wentworth	GA	1958
Scherer	Southern Company	Juliette	GA	1981
Big Bend	TECO	Ruskin	FL	1970
F J Gannon	TECO	Ybor City	FL	1957
Allen	TVA	Memphis	TN	1958
Bull Run	TVA	Clinton	TN	1967
Colbert	TVA	Tuscumbia	AL	1954
Cumberland	TVA	Cumberland City	TN	1972
John Sevier	TVA	Rogersville	TN	1955
Paradise	TVA	Drakesboro	KY	1963
Widows Creek	TVA	Stevenson	AL	1952

Enforcing the Law

Today the vast majority of coal- and oil-fired power plants have avoided the most protective air emissions standards. When the Clean Air Act was amended in 1970 and 1977, it was expected that these power plants would retire and be replaced by cleaner, new power plants and that these plants therefore should be exempt from having to install modern pollution controls. Grandfathered power plants emit sulfur dioxide and nitrogen oxides air pollution at rates up to 10 times that of modern coal plants and coal plants retrofitted with modern technology. Today's emission control technology routinely achieves more than a 75 percent reduction in power plant nitrogen oxide and sulfur dioxide emissions.¹²

These plants were expected to retire, but for a variety of reasons they have not. The NSR enforcement cases against 51 old coal-fired power plants demonstrate that, instead, a large number of the nation's biggest polluters have quietly upgraded their facilities, extending their useful lives and significantly increasing their emissions, without installing legally required pollution controls or even obtaining a permit. These plants have effectively extended their "grandfathered" status indefinitely in violation of law.

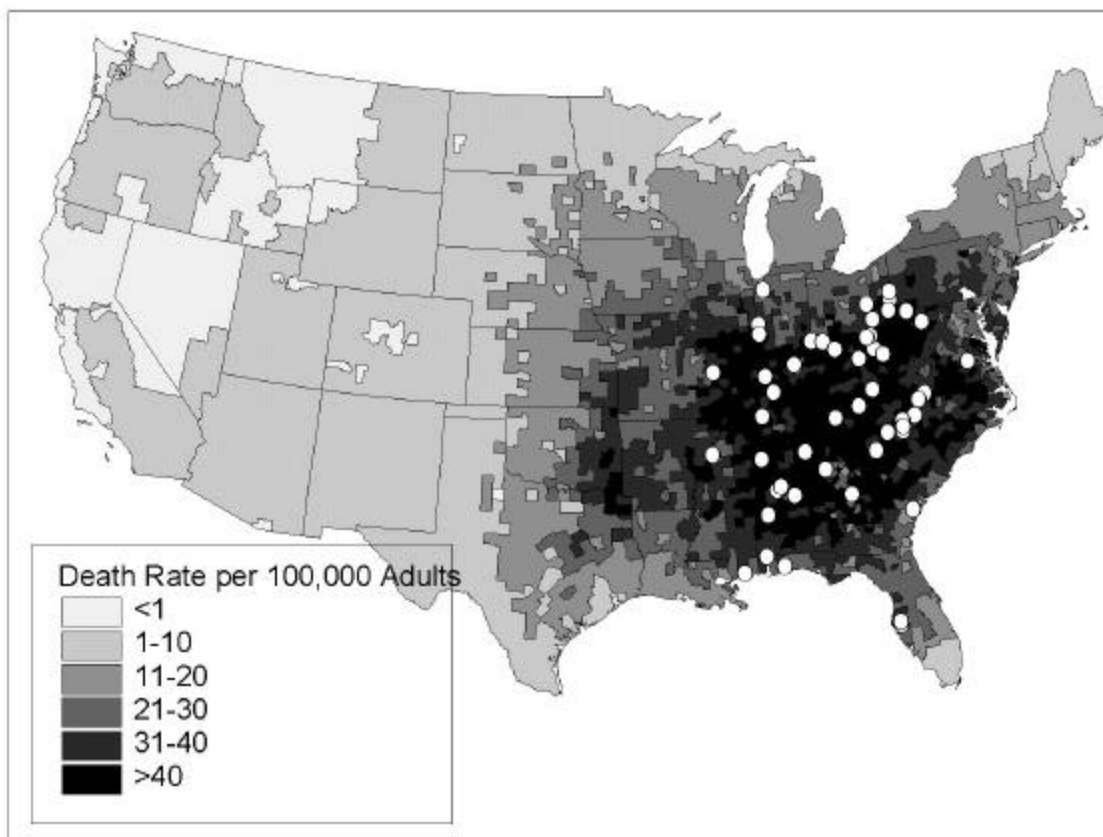


Figure 2: Plants Charged with NSR Violations (white dots) and Risk of Death: NSR violators are predominantly located in the areas of highest risk from premature mortality due to particulate matter pollution from power plants (source: MSB Energy Associates.)

Industry has charged that the EPA under former President Clinton suddenly changed the "rules of the game" and brought enforcement actions against plants for practices that previously were considered legal. However, the NSR regulations were last amended in 1992 under the first Bush Administration and remained consistent throughout the Clinton years. After the 1992 rule had been in place for a few years, EPA found that very few NSR permit applications were being filed relative to the number expected from older plants due for major overhauls. EPA then launched an investigation to determine why. As a result of its investigation, EPA found that many plants in fact had been violating the New Source Review rules for years. EPA and some states have issued numerous notices of violation to power plant owners. To date, the owners of 51 plants in twelve states have been charged with violations of the Clean Air Act.

The Case Against the Plants

Without exception, companies alleged to have violated New Source Review have claimed that they were only engaged in "routine maintenance," not modifications of their plants that would require modern emissions controls. They have resorted to the familiar refrain of the schoolyard -- "everybody else was doing it, so it must be o.k." However, the evidence available to the public from the 51 cases indicates that the modifications were anything but "routine". In general:

- The modifications were expensive. These modifications were often the largest capital projects ever undertaken at the plants and represented a very high percentage of the original construction cost of the boiler;
- The modifications involved years of planning, using a separate process than was used for planning maintenance activity;
- The plants needed to be removed from service for extended periods. In some cases, to carry out the physical changes required outages of 3-6 months, far longer than the typical 4-5 week scheduled annual outage for maintenance or 3-4 day forced maintenance outages usually experienced at plants;
- Without the modifications, many of the plants would have been retired. Several of the plant upgrades were undertaken after studies showed that the plant could not continue to operate economically;
- Many of the modifications were undertaken by special teams of employees, consultants and contractors who typically were not involved in ordinary maintenance;
- The modifications allowed the plants to operate more hours and at higher rates than would have been possible without plant changes.

The Evidence: Routine Maintenance that is neither "Routine" nor "Maintenance"

A few examples from the cases are illustrative and belie industry's claims that the modifications involved only "routine maintenance":

- 1) At its Allen plant, the Tennessee Valley Authority's replacement of a reheater involved cutting a 25-foot hole in the boiler wall at a location 10 stories off the ground, constructing a mono-rail line and trolley system to transport the old components out of the boiler. The project required a work force of over 70 people. At

one point the project had 60 to 80 welders working at one time to put the new components in place¹³.

- 2) American Electric Power (AEP) modified its Big Sandy plant in Kentucky in ways that allegedly led to an annual increase in sulfur dioxide emissions of 18,000 tons -- more than the total emissions from a new coal plant.¹⁴
- 3) At its Tanners Creek plant in Indiana, AEP allegedly replaced 11 furnaces but claims this was "routine maintenance."¹⁵
- 4) In testimony before the Ohio Public Utilities Commission, an AEP engineer admitted that normal maintenance generally would sustain a unit only through its 40th birthday¹⁶. Many of the AEP plants cited for NSR violations celebrated their 40th birthday years ago. Instead of retiring the old units, AEP engaged in an aggressive program of capital investment to extend their lives.
- 5) At its Scherer and Bowen plants in Georgia, and its Miller plant in Alabama, the Southern Company even allegedly constructed entirely new units without a permit.¹⁷

THE FUTURE OF CLEAN AIR

Pardons for Polluters? Will the Enforcement Actions be Dropped?

On June 28, 2001, *the Bush Administration froze its investigation and enforcement actions* against electric power generators pending review of the cases by the Justice Department and of the NSR policy by EPA and other agencies.¹⁸ This action resulted from the Bush Energy Plan that had called for the reviews.¹⁹

Although Attorney General Ashcroft thus far has reached no conclusions in his review of ongoing NSR enforcement cases, the mere fact that the Administration has called into question whether these cases should proceed has already had a chilling effect. Justice Department negotiators have informed Dominion Power which was on the verge of settlement that it should wait until August 17 when the review is completed.²⁰ In addition, Cinergy indicated that it wants to re-examine its position as a result of the Bush Energy Plan. Cinergy has asked to rejoin Southern Company, American Electric Power (AEP)—the largest power companies in the U.S. and other companies that formed an alliance to fight the NSR enforcement effort.²¹

While EPA has been engaged in a series of stakeholder meetings and is beginning a round of public hearings to formulate its report to the White House,²² an EPA source has cautioned that the White House still could order EPA to change its view of NSR and/or back off the enforcement actions altogether. "It's the Cheney, CEO, structured chain-of-command model" that could lead to a reversal of NSR policy, the EPA source warned.²³ Moreover, EPA has released a preliminary evaluation of NSR that focuses almost exclusively on industry's complaints about the program and how it might be weakened. There is virtually no inclusion of the public health and environmental benefits that result from the NSR program, or how strengthening NSR might increase these benefits. For this reason, the Clean Air Task Force has undertaken an analysis to quantify the potential health benefits from successful completion of the current power plant enforcement actions.

STRONG NSR ENFORCEMENT COULD PREVENT THOUSANDS OF PREMATURE DEATHS EACH YEAR

Numerous studies have shown that pollutants from power plants are associated with serious health impacts including asthma attacks, heart attacks, adverse birth impacts and premature death. Despite these well-documented threats to America's health, some members of the Bush Administration appear to be more interested in weakening NSR to boost electricity production than in strengthening it to protect public health. In targeting the NSR rules and enforcement actions, they are taking aim at the heart and lungs of the Clean Air Act's public health protections. The NSR provisions, if enforced, hold out the promise of continual improvement in air quality even as the economy expands and electricity demand is met through new generation capacity.

To determine the health benefits of cleaning up power plant air pollution, the Clean Air Task Force commissioned Abt Associates, the consulting firm relied upon by EPA to assess the health benefits of many of the agency's air regulatory programs. Drawing on an earlier study by Abt Associates documenting the health impacts from all power plants in the U.S., Clean Air Task Force was able to quantify the toll of asthma attacks and premature deaths from fine particle pollution from the 51 plants subject to NSR enforcement.²⁴ The underlying data in that report also allows us to quantify the asthma attacks and premature deaths that would be avoided by requiring the plants to meet modern standards.²⁵ See Appendix B for a discussion of the methodology used in this report.

The Toll from the Plants Charged with NSR Violations

By focusing on the emissions from the NSR plants in the Abt Associates analysis, the Clean Air Task Force has been able to isolate the contribution of these plants to respiratory death and disease:

<i>Deaths</i>	<i>Avoidable Deaths</i>	<i>Asthma Attacks</i>	<i>Avoidable Asthma Attacks</i>
5,500-9000	4,300-7000	107,000-170,000	80,000-120,000

Table 2: Projected Benefits Resulting from Full Enforcement of New Source Review Provisions of the Clean Air Act on the Power Plants Charged with Violations.

The Abt Associates data show that thousands of premature deaths, ranging between 5,500 and 9,000 each year are attributable to fine particle pollution from the 51 plants that are the targets of NSR enforcement.²⁶

Further, the results demonstrate that by requiring these plants to meet modern pollution standards for sulfur dioxide and nitrogen oxides, between 4,300 and 7,000 of these deaths could be avoided each year.

Respiratory distress severe enough to constitute an asthma attack can be a terrifying experience for patients and their families. Victims of asthma attacks say that during an attack they wonder if and when their next breath will come. Bouts of respiratory illness and asthma attacks mean lost workdays for workers and lost productivity for their employers. The Abt Associates data shows that 107,000 to 170,000 asthma attacks a year are attributable to the air pollution from the 51 plants and that between 80,000 and 120,000 of these asthma attacks could be avoided simply by enforcing the NSR provisions and requiring these plants to meet modern standards.

In addition to these serious physical and emotional costs, air pollution also wracks up large monetary costs. Using accepted valuation methodology employed by EPA in its regulatory impact analyses, Abt Associates' analysis shows that the monetized benefits of requiring the 51 NSR plants to meet modern pollution standards would be \$27 to 45 billion per year.

NSR Violators: The Lion's Share of Dirty Power

The 51 plants that are the targets of the NSR enforcement actions are among the largest and dirtiest in the nation and they contribute a disproportionate share of the pollution from the power plant fleet. As a group, the NSR plants make up a little over 11 percent of the nation's electric capacity from fossil-fueled power plants. However, these plants are responsible for over 24 percent of the nitrogen oxides emissions and over 27 percent of the sulfur dioxide emissions from all fossil plants nationally.

Transport of Death and Disease: Impacts on Downwind States

Although the current NSR cases have been brought against plants located in the Midwest and Southeast, the effect of their pollution is not confined to that region. Prevailing wind currents carry fine particle pollution created in those regions into the Mid-Atlantic and Northeastern states as well. Between 1,500 and 2,100 premature deaths and 30,000 to 39,000 asthma attacks per year in the Northeast²⁷ are attributable to the pollution from the NSR targets. 1,200 to 1,700 of the deaths and 23,000 to 31,000 of the asthma attacks would be avoided if the plants met modern pollution standards. See Appendix A for a state-by-state summary of impacts and benefits.

The New Source Review Settlements Announced to Date would Avoid Approximately 1,000 Premature Deaths Each Year

EPA has reached a final settlement with one operator, Tampa Electric, and has reached agreements-in-principle with Cinergy, Inc. and Dominion Power. Those settlements provide for a total emissions reduction of nearly 650,000 tons of sulfur dioxide and 300,000 tons of nitrogen oxides per year.²⁸ If the pollution reductions committed to in the settlements are achieved, they will result in avoiding 780 to 1,150 premature deaths per year. However, the Cinergy, Inc. and Dominion Power settlements have been thrown into limbo by the Bush Administration review.

A Comprehensive Federal Solution that Closes the Lethal Loophole is Still Needed

The analysis also reveals that simply pursuing the current NSR cases to successful completion will not by itself solve the problem of death and disease from power plant pollution. While requiring that the current NSR target plants meet modern pollution standards will save between 4,300 and 7,000 lives per year, between 13,800 and 23,100 premature deaths per year due to power plant pollution would remain.

CONCLUSIONS

- **The Administration should aggressively pursue existing NSR enforcement actions to conclusion and continue investigating whether other power plants have violated the law.** Now that policymakers know that cleaning up these power plants to modern standards could save between 4,300 and 7,000 lives per year, there is no excuse for further delay. Moreover, with between 13,800 and 23,100 premature deaths per year that would continue even if the 51 plants were cleaned up, there is no excuse for closing the book on new investigations.
- **EPA should affirm the NSR rules.** EPA should affirm the NSR rules under which these enforcement actions were brought. In spite of industry claims to the contrary, EPA to date has cited no evidence that NSR rules are inhibiting energy production. Moreover, there is no basis for industry's claims that EPA has unfairly reinterpreted NSR. The NSR provisions of the Clean Air Act are not new. The industry has had fair notice that major modifications that extend the lives of grandfathered plants and significantly increase their pollution cannot be made legally without also upgrading their pollution controls. If these plants are worth upgrading, they are worth cleaning up. EPA should complete its review, affirm the NSR safeguards, and redouble its efforts to enforce them.
- **The "Lethal Loophole" Should be Closed for all Power Plants.** To protect public health in a comprehensive fashion, all fossil power plants should meet modern emission control standards. As this analysis demonstrates, even if each of the 51 current NSR enforcement actions were brought to successful conclusion, many avoidable power plant pollution-related deaths would still occur. Ultimately, the nation's power fleet should be held to nationwide caps on all four of the key power plant pollutants, including nitrogen oxides, sulfur dioxide, mercury, and carbon dioxide. A 75 percent reduction in power plant sulfur dioxide and nitrogen oxides emissions would result in substantial health and environmental benefits and is readily achievable with existing control technologies. The deaths and disease due to 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.

APPENDIX A: Estimated Attributable Deaths and Asthma Attacks by State*

State	Deaths	Avoidable Deaths	Asthma Attacks	Avoidable Asthma Attacks
Alabama	194-464	151-361	3,708-8,563	2,776-6,558
Connecticut	56-77	45-56	1,164-1,480	906-1,098
Delaware	31-35	25-28	649-734	511-554
District of Columbia	24 - 43	19 - 32	383 - 673	297 - 493
Florida	400 - 743	337 - 562	6,932 - 11,898	5,705 - 9,187
Georgia	289 - 691	225 - 514	6,941 - 16,052	5,237 - 11,841
Illinois	218 - 353	170 - 248	4,266 - 6,768	3,273 - 4,790
Indiana	184 - 266	136 - 180	3,754 - 5,264	2,681 - 3,521
Kentucky	173 - 325	124 - 215	3,379 - 6,140	2,345 - 4,029
Maine	13 - 20	9 - 16	240 - 404	179 - 313
Maryland	186 - 295	149 - 220	4,222 - 6,364	3,254 - 4,761
Massachusetts	88 - 104	71 - 74	1,743 - 1,998	1,386 - 1,441
Michigan	199 - 205	152 - 153	4,265 - 4,305	3,202 - 3,177
Mississippi	80 - 175	62 - 132	1,518 - 3,220	1,142 - 2,420
Missouri	111 - 187	90 - 130	1,996 - 3,300	1,602 - 2,264
New Hampshire	15 - 19	11 - 15	340 - 417	247 - 329
New Jersey	200 - 304	163 - 224	3,910 - 5,741	3,092 - 4,281
New York	353 - 534	285 - 375	7,065 - 10,285	5,558 - 7,247
North Carolina	399 - 790	299 - 560	8,685 - 16,246	6,086 - 11,216
Ohio	406 - 638	306 - 459	7,973 - 12,181	5,805 - 8,696
Pennsylvania	546 - 705	448 - 515	9,789 - 11,560	7,497 - 8,418
Rhode Island	20 - 21	16	353 - 388	286 - 305
South Carolina	145 - 304	106 - 222	3,105 - 6,108	2,166 - 4,474
Tennessee	270 - 553	193 - 367	5,228 - 10,249	3,577 - 6,711
Vermont	9 - 13	6-10	193 - 276	138 - 220
Virginia	392 - 430	291 - 327	5,786 - 9,208	4,218 - 6,723
West Virginia	123 - 202	95 - 141	2,097 - 3,213	1,532 - 2,224
Wisconsin	56 - 74	44 - 55	1,186 - 1,522	920 - 1,128

* States where plants charged with NSR violations are located or that receive significant impacts from their emissions.

APPENDIX B: How the Health Impacts were Estimated

In 2000, the Clean Air Task Force commissioned Abt Associates; the consulting firm relied upon by EPA to assess the health benefits of many of the agency's air regulatory programs, to quantify the toll of death and disease from fine particle pollution from power plants.²⁹ The study also assessed the death and disease that would be avoided by requiring those plants to meet modern pollution standards.

Numerous studies over the years have linked fine particles to a variety of health damages including premature death and increased asthma attacks. EPA estimates that attainment of the new health standard for fine particles alone could save 15,000 lives each year.³⁰

In its October 2000 report, Abt Associates, using peer-reviewed, state-of-the-art research methodology, found that over 30,000 deaths each year are attributable to fine particle pollution from U.S. power plants. The underlying health studies show that these people are dying years earlier because of power plant air pollution. Further, the study found that by requiring the fleet of older, dirty power plants to cut its sulfur dioxide and nitrogen oxide emissions by 75 percent—far short of the reductions achievable with today's technology, over 18,000 of these deaths could be avoided.

Moreover, asthma in the U.S. has reached epidemic proportions over the past decade, especially among children. Fine particle pollution has been demonstrated to trigger asthma attacks. The Abt Associates report estimated that hundreds of thousands of Americans suffer from asthma attacks each year due to fine particles from power plants and that the vast majority of these could be avoided by power plant clean up. The plants analyzed in the earlier Abt Associates study include the 51 plants that are subject to the NSR enforcement actions.

Abt Associates used methods developed for and employed by the EPA, extensively reviewed and endorsed by EPA's Science Advisory Board, and accepted by the U.S. Office of Management and Budget in a variety of regulatory impact and assessment contexts.³¹ Because these health effects estimates include solely the effects of airborne fine particles—just one of many pollutants attributable to power plants, these estimates significantly understate the total adverse health impacts on the public from power plants due to other air pollutants as well as impacts on our land and water resources. Excluded from these estimates are the health effects from other power plant pollutants, such as air emissions that result in ozone smog, air toxics, global warming, and the impacts from the consumption of fish contaminated by power plant mercury emissions.

In its analysis, Abt Associates assumed full implementation of the laws and regulations that currently require air pollution reductions from the power industry, even though all of the required emission reductions have not yet occurred. The base case assumed full implementation of EPA's Summer Smog rule (i.e., the NO_x SIP Call) and implementation through 2007 of the Acid Rain program. Abt Associates analyzed the following scenarios:

1. Base case: full implementation to 2007 of the Acid Rain program (Phases 1 and 2) and EPA's Summer Smog rule (the NO_x SIP Call);
2. Base case in 2007 minus all power plant emissions -- subtracting power plant emissions from the base case gives us the health endpoints due solely to power plant emissions;
3. Base case in 2007 minus a 75 percent reduction in nitrogen oxides and sulfur dioxide from 1997 levels (based on equals 0.3 lbs./mmbtu emissions rate for sulfur dioxide and 0.15 lbs./mmbtu rate for nitrogen oxides).³²

Using the emissions inventory for power plant and non-power plant emissions of nitrogen oxides, sulfur dioxide, and direct particulate matter emissions, the study team ran EPA's particulate matter air quality models: Source-Receptor Matrix (S-R Matrix) (used to model the NO_x SIP Call and other regulatory actions) and Regional Emission Modeling System for Acid Deposition (REMSAD) (approved by EPA's Science Advisory Board and used in the Clean Air Act cost-benefit study). Both air quality models were used to estimate the baseline fine particle contributions attributable to the power plants and the reductions in pollutant concentrations due to the targeted reductions. The inputs and assumptions used by the team were consistent with recent regulatory impact analyses performed for EPA, such as the Summer Smog rule (regional NO_x SIP Call rule), automobile emissions standards (Tier 2), Heavy-Duty Diesel rule (HDE), and other similar analyses. The health effects and benefits are reported here as a range between the S-R Matrix results and the REMSAD results.³³

This air pollution concentration analysis provided inputs for the health effects assessment. Then utilizing health studies which link changes in ambient fine particle concentrations to changes in risk of mortality and asthma attacks, pollution concentration-response functions were derived that quantify the relationship between the forecasted changes in exposure and the expected changes in these specific health effects. Abt Associates then used the modeled changes in pollutant concentrations (from the base case to the 75% or "BACT" case) to estimate the power plant-attributable health impacts. The difference between the base case and the BACT case yielded estimates of the health benefits (or avoided adverse impacts).

MSB Energy Associates on behalf of the Clean Air Task Force extracted the relevant data from the Abt Associates study using the underlying data from the October 2000 Abt Associates report and a proprietary computer program designed by Abt Associates. The analysis isolates the contribution to premature mortality and asthma attacks attributable solely to the pollution from the NSR enforcement target plants for each of the areas of interest.

ENDNOTES

- ¹ U.S. EPA, Office of Enforcement and Compliance Assurance, "Summary of Power Plants Enforcement," available at <http://es.epa.gov/oeca/ore/aed/coal/ppsl.html>.
- ² U.S. Department of Justice, U.S. EPA, "U.S. Sues Electric Utilities in Unprecedented Action to Enforce the Clean Air Act," press release, November 3, 1999.
- ³ Fine particles are a mixture of a variety of different compounds and pollutants that originate primarily from combustion sources such as power plants, diesel trucks, etc. They are sometimes referred to as PM_{2.5} (particulate matter smaller than 2.5 microns in diameter). Fine particles are either emitted directly from these sources or are formed in the atmosphere through complex reactions involving gases such as sulfur dioxide or nitrogen oxides.
- ⁴ *The National Energy Policy: Report of the National Energy Policy Development Group* (May 2001) available online at: <http://www.whitehouse.gov/energy/>.
- ⁵ Abt Associates, Inc., *The Particulate-Related Health Benefits of Reducing Power Plant Emissions* (October 2000). See also, Clean Air Task Force, *Death, Disease, and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants* (October 2000) available online at: www.cleartheair.org.
- ⁶ "Best Available Control Technology" or "BACT" for sulfur dioxide and nitrogen oxides.
- ⁷ For the purposes of this report, the Northeast is defined as District of Columbia, Maryland, Delaware, New Jersey, Pennsylvania, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.
- ⁸ See CAA §§ 160-169, 42 U.S.C. §§ 7470-7492 and CAA §§ 171-193, 42 U.S.C. §§ 7501-7515.
- ⁹ *Ibid.*
- ¹⁰ *Wisconsin Electric Power Co. (WEPCO) v. Reilly* (7th Cir. 1990).
- ¹¹ *Alabama Power Co. v. Costle*, (D.C. Cir. 1980).
- ¹² For sulfur dioxide, control efficiencies of 90-95 percent are achievable. See e.g., Srivastava, R. K., *Control of SO₂ Emissions: An Analysis of Technologies*. EPA ORD (2000) EPA/600R-00/093.
- ¹³ In re: Tennessee Valley Authority, Transcript of proceedings at 240-242 and p. 17 of Direct Testimony of Alan Heckking, Plant Manager.
- ¹⁴ September 15, 1999 letter from Eliot Spitzer, Attorney General of New York, to William J. Lhota, President Kentucky Power Co., et.al.
- ¹⁵ *USA v. AEP*, Complaint.
- ¹⁶ Testimony of Myron D. Adams, American Electric Power, July 20, 1994, before the Public Utilities Commission of Ohio.
- ¹⁷ *USA v. Alabama Power and Georgia Power*, Complaint.
- ¹⁸ *The Wall Street Journal*, "White House Review Freezes EPA Inquiry" June 28, 2001.
- ¹⁹ *The National Energy Policy: Report of the National Energy Policy Development Group* (May 2001) available online at: <http://www.whitehouse.gov/energy/>.
- ²⁰ *The Wall Street Journal*, "White House Review Freezes EPA Inquiry" June 28, 2001.
- ²¹ *Air Daily* (Energy Argus Publishers), "Bush Energy Policy May Stall CAA Accord," May 21, 2001.
- ²² 66 Fed.Reg. 34183 (June 27, 2001) .
- ²³ *Air Daily* (Energy Argus Publishers), "Bush Likely To Weigh-in On NSR," May 9, 2001.
- ²⁴ Abt Associates, Inc. *The Particulate-Related Health Benefits of Reducing Power Plant Emissions* (October 2000) available online at: www.cleartheair.org
- ²⁵ Best Available Control Technology (BACT) standards for nitrogen oxides (NO_x) and sulfur dioxide (SO₂) (for the purpose of the analysis, Abt Associates assumed that BACT for coal plants equals 0.3 lbs./mmbtu for SO₂ and 0.15 lbs./mmbtu for NO_x).
- ²⁶ It is important to note that because the Abt Associates analysis assumes full implementation of the NO_x SIP Call and Phase II of the Acid Rain program, these plants are assumed already to have made reductions that have not yet occurred. Therefore, the analysis may substantially understate the current attributable health impacts from these plants.
- ²⁷ For the purposes of this report, the Northeast is defined as District of Columbia, Maryland, Delaware, New Jersey, Pennsylvania, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.
- ²⁸ U.S. EPA, NSR 90-Review Background Paper (June 22, 2001) at 10.

²⁹ Abt Associates, Inc., *The Particulate-Related Health Benefits of Reducing Power Plant Emissions* (October 2000) and Clean Air Task Force, *Death, Disease, and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants* (October 2000) available online at: www.cleartheair.org

³⁰ U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, 1996 Staff Papers on Smog and Soot Pollution: "Review of the National Ambient Air Quality Standards for Ozone and Particulate Matter" (1996).

³¹ *Ibid.*

³² Abt Associates Inc. October 2000 original work assumed a national cap based on a 75% reduction from 1997 emissions based full compliance with the NOx SIP Call and through Phase 2 of the Acid Rain program with emissions grown to 2007. Assuming full compliance with the NOx SIP Call and the Acid Rain program the results here greatly understate the current impacts from these plants. The cap was based on emission rate limits of 0.3 lbs./mmbtu for SO₂ and 0.15 lbs./mmbtu for NOx. The analysis allowed emissions credit trading between plants to comply with the requirements. As a result, the emissions inventories do not assume full BACT compliance at each unit for the entire U.S. fleet. However, the results of the analysis found that the 51 NSR target plants do meet a level of overall emission reduction commensurate with BACT. Thus, the relative benefits of BACT controls are not likely to be understated.

³³ The S-R Matrix results for the NSR plants are modeled outputs. The REMSAD results are based on modeled REMSAD county-by-county values and a comparison of ratios derived from S-R Matrix county-level results.



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