

Smokestacks and Smoke Screens

**Big Polluters,
Big Profits,
and the Fight for
Cleaner Air**

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Foreword

Say what you will about the executives whose corporations are trying to kill a proposed clean air rule that would save 35,000 American lives each year. But grant them this: They're rich as Midas.

Take Lee Raymond, for example. He pulled in a sweet \$17,699,911 in compensation, plus stock options, in 1996 alone, as CEO of Exxon, member in good standing of the "Air Quality Standards Coalition," the industry group established to oppose EPA's clean air proposal. In recent years Exxon's facilities annually dumped more than 50,000 tons *each* of sulfur dioxide and nitrogen oxides into the air, two of the main precursors of particulate pollution (which forms when gaseous pollutants combine with other chemicals after they are spewed into the atmosphere). Exxon pumped another 2,500 tons of fine particles into the air. Together, these pollutants constitute the deadly toxic soot that EPA wants to control, based on the overwhelming preponderance of scientific evidence.

Thanks to the AFL-CIO's nifty web site (www.aflcio.org), we

know that it would take the average American worker (earning \$24,700 annually) about 717 years to make what Raymond made in 1996. Apropos of clean air, one year's worth of Mr. Raymond's compensation could just about pay for the entire capital cost (\$18.5 million) of installing the nationwide pollution monitoring network that EPA proposed as part of the particulate standard. Surely Exxon could scrape together an \$800,000 bonus to make up the difference (it's only about 3 more weeks of work at Raymond's 1996 compensation rate of \$8,510 per hour). After all, the company's annual revenues averaged *\$129 billion* over the last two years.

Or what about the head of American Electric Power, another "Air Quality Standards Coalition" member? E. Linn Draper pulled down a meager \$1.7 million in compensation in 1996 (173 years of work at minimum wage). But you can see why his \$5.76 billion company might find it more cost effective to buy into a P.R. campaign against the environment, built on a focus-grouped defense of the common man, than to buy pollution control equipment:

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The polluters collectively earn well over \$1 trillion per year. Their CEO's rake in millions annually in compensation. Their pollution snuffs out thousands of lives

American Electric dumped 1,240,032 tons of sulfur dioxide, 492,051 tons of nitrogen oxides, and 8,647 tons of particles into the air annually in recent years.

And so on down the list of major particulate polluters in the United States. The polluters collectively earn well over \$1 trillion per year. Their CEO's rake in millions annually in compensation. Their pollution snuffs out thousands of lives and causes billions of dollars in illnesses, but those costs currently are borne by hospital patients, their insurance companies, or by taxpayers who bear the burden of attendant Medicare or Medicaid disbursements.

So, with a modest investment in public relations, lobbying and campaign contributions, oil companies, power plants, steel mills and other big polluters are heading for a big win in this year's fight over cleaner air. The only way they'll lose is if the public demands its breathing rights from Al Gore, Bill Clinton, and Congress.

One of the nice things about being a super-rich CEO in charge of a major, polluting company is that your fingerprints won't be on the scurrilous attacks on the EPA and its proposed clean air standards. Not when you've got platoons of front groups, trade association hacks and rented scientists to do your mischief for you.

Our personal favorite is Citizens for a Sound Economy, led by former Bush White House official C. Boyden Gray, now a lobbyist

for Geneva Steel. The company earned revenues of \$712 million in 1995, while belching 5,067 tons of nitrogen oxides, 1,043 tons of fine particles, and 972 tons of sulfur dioxide into the skies above Orem, Utah.

CSE has produced and bankrolled most of the duplicitous and (by now) discredited print and radio ads attacking EPA and its proposed air rule.

In one of CSE's outlandish radio fantasies an actor playing a pediatrician listens as the actor playing his son says that the proposed regulations "would drive up the price of cars, force people into car pooling, maybe even end up banning thing like barbecue grills and lawnmowers." It's utter nonsense, to put it charitably, so much so that at least one Chicago radio station yanked the ad on accuracy grounds. Then again, if you're sitting on top of smokestacks like Geneva Steel's, why *not* try to scare people into thinking that the fight is all about their Webers and Toros. And while CSE's radio pediatrician was a fraud, 1,375 *real* physicians and other health care professionals wrote in support of the new standards because they will keep people healthy and save lives.

When the barbecue grill/lawnmower canard became an embarrassment, CSE floated another whopper—an ad claiming that the new rule might force an end to July 4th fireworks dis-

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plays. But that ad, too, proved to be completely unfounded in fact or science, and was summarily pulled by CSE itself. Now these good “Citizens” are running farm-belt ads suggesting that EPA will restrict “when, where and how corn, wheat, beef and chickens are raised.” Never mind that EPA has made clear that farming’s share of the problem is not what CSE claims, and that decades-old, voluntary farm conservation programs are adequate to the task.

Back in 1990, then-EPA Administrator Bill Reilly out-foxed and out-maneuvered Gray (along with John Sununu and David McIntosh) during Bush Administration in-fighting over the law that gave rise to the proposed air regs—the Clean Air Act Amendments of 1991. It would be achingly ironic if the dirty tricks campaign Gray has mounted were to prevail with the Clinton White House in 1997, just as the Bush Clean Air Act is about to provide one of the vital public health improvements it was intended to bring about.

The book in Washington on the proposed clean air rule cur-

rently runs something like this: EPA Administrator Carol Browner has put up a tough, consistent fight for the clean air rule she proposed, including four grillings before congressional committees. But she’s been fighting without much visible Administration support. In vivid contrast to the rigorous and relentless public support that Vice President Gore and President Clinton gave to FDA Commissioner David Kessler when his proposed rules to regulate tobacco were under consideration—just before the election—it appears that Browner has been left on her own.

The White House’s apparent AWOL status has only emboldened the smokestack caucus on Capitol Hill. They’re pressuring the White House to pressure Browner to weaken, delay or deep-six the proposal so that Congress doesn’t have to face a tough vote.

For too many in Congress, that scenario would be ideal: our air would still be dirty, but their voting records would be clean. To the extent that *Smokestacks and Smoke Screens* can prevent that outcome, we’ll all breathe easier.

Kenneth A. Cook
President
EWG

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Executive Summary

Tens of thousands of people die prematurely each year from microscopic toxic particles in the air we breathe. To reduce particle pollution to safe levels, EPA has proposed updating the decade-old health standard for so-called “particulate matter”. According to the EPA, updated health standards, in combination with other ongoing pollution control initiatives, will save 35,000 lives each year (EPA 1997).

Even before EPA formally proposed these new health standards, major power, oil, chemical, paper and mining companies launched a multi-million dollar public relations campaign to thwart any change in air pollution standards. Not unwisely, these corporations reasoned that it was more cost effective to buy public opinion and influence the Congress with slick PR, than to buy the pollution control equipment required by the rule.

Industry has advanced two specious arguments in this high powered PR blitz. First, that cleaner air means restrictions on personal activities like barbecue grilling and lawn mowing. And second, that cleaner air is not affordable. EWG analysis of air

emissions data from EPA and the states reveals that exactly the opposite is true.

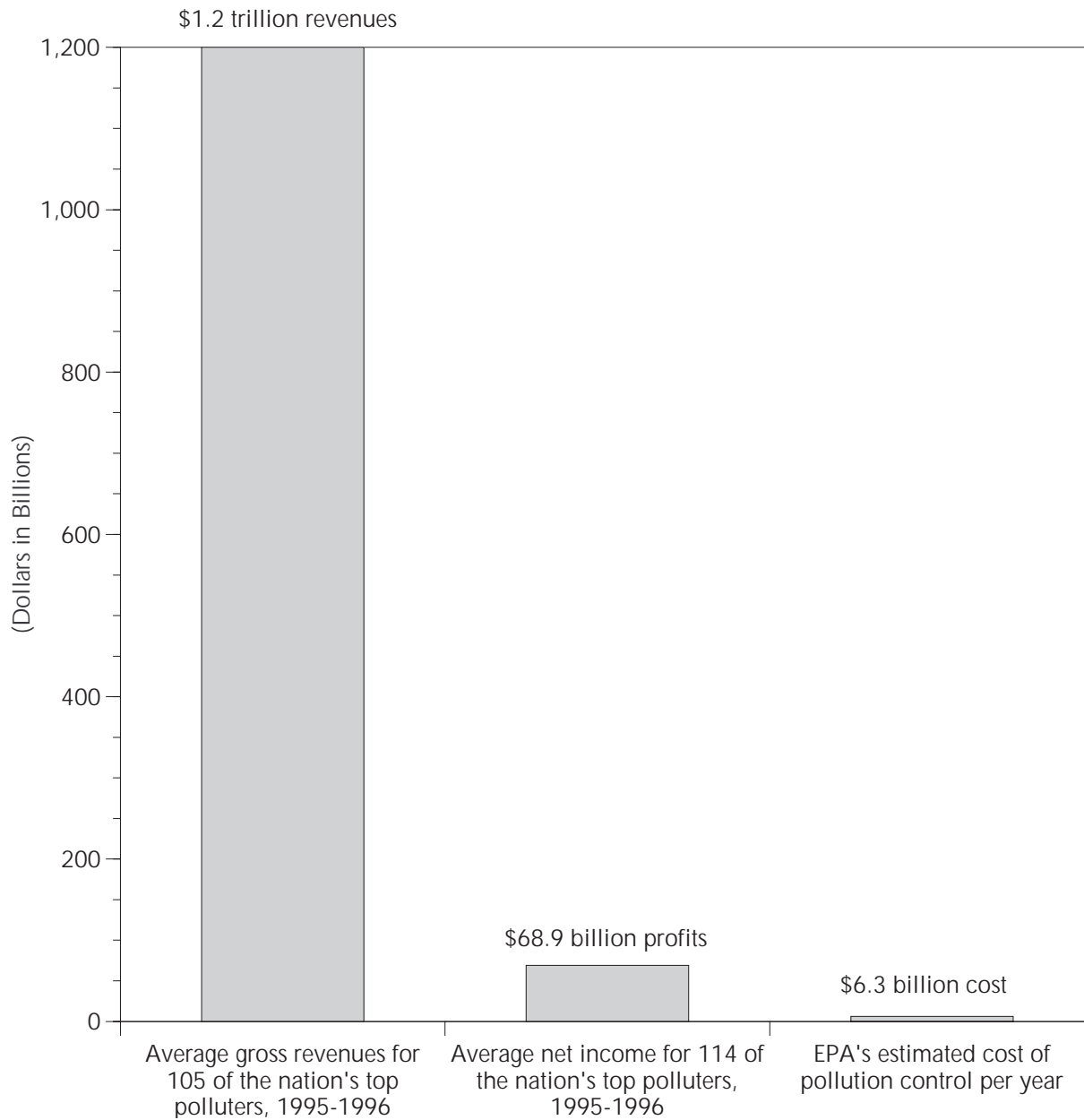
Stationary sources (factories and power plants, as opposed to cars and trucks) account for 96 percent of SO₂ emissions, 56 percent of particle pollution, and 48 percent of NO_x emissions, the three major forms of particulate pollution. Rational strategies to control particulate pollution will focus on these sources first.

More to the point, major particulate polluters are extraordinarily profitable and can easily afford pollution controls needed to clean the air. This study found that the combined gross revenues for 105 of the nation’s top particulate polluters averaged \$1.2 *trillion* dollars per year for the last two years (1995-1996), 200 times the cost of achieving the proposed particulate standard. In contrast, EPA estimates the cost of compliance with the new health standard at \$6.3 billion per year, or less than one half of one percent of the gross revenues of the major polluters (Figure A). A slightly larger number of companies (114 of the top polluters) reported annual profits (net income) of \$68.6 billion for the same time period, more than

The combined gross revenues for 105 of the nation’s top particulate polluters averaged \$1.2 *trillion* dollars per year for the last two years (1995-1996).

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Figure A. The cost of clean air is a tiny fraction of the annual revenues and profits of America's major polluters.



Source: Environmental Working Group. Compiled from Securities and Exchange Commission, EDGAR database (<http://www.sec.gov>). The 1995 and 1996 annual gross revenue and net income data were compiled by EWG from "Form 10-K", electronically filed annual reports to the SEC, submitted through the first quarter of 1997. Data were supplemented with annual reports for some companies.

eleven times the yearly cost of meeting the new health standard.

Some of America's richest and most powerful corporations are behind the drive to sandbag any

Table A. Some of America's richest corporations are also the biggest polluters.

	Average Annual Gross Revenues (1995-96)	Annual SOx Emissions (tons)	Annual NOx Emissions (tons)	Annual Particulate Emissions (tons)
Oil and Chemical Corporations				
Exxon Corp	\$ 129,084,500,000	54,851	53,374	2,522
Mobil Corp	\$ 78,436,500,000	44,895	29,468	3,218
DuPont E I De Nemours & Co	\$ 44,186,000,000	89,001	116,314	7,360
Texaco Inc	\$ 41,143,500,000	21,373	32,834	919
Chevron Corp	\$ 40,487,500,000	30,666	32,488	1,229
Steel and Aluminum Corporations				
USX Corp	\$ 22,404,000,000	70,461	45,810	68,973
Aluminum Co of America	\$ 12,891,650,000	73,641	24,913	7,444
Reynolds Metals Co	\$ 7,134,000,000	18,117	2,919	4,381
Bethlehem Steel Corp	\$ 4,773,250,000	14,237	13,033	3,513
Inland Steel Industries Inc	\$ 4,682,800,000	4,602	13,879	5,164
Power Companies				
Southern Co Inc	\$ 9,790,000,000	932,989	372,390	39,533
Pacific Gas & Electric Co	\$ 9,615,868,500	4,061	23,564	2,570
Texas Utilities Co	\$ 5,795,036,500	247,709	119,115	10,562
Public Service Enterprise Group Inc	\$ 5,766,300,500	11,872	20,352	1,470
American Electric Power Co	\$ 5,759,782,000	1,240,032	492,051	8,647

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain Database; and Securities and Exchange Commission, EDGAR database (<http://www.sec.gov>). The 1995 and 1996 annual gross revenue and net income data were compiled by EWG from "Form 10-K", electronically filed annual reports to the SEC, submitted through the first quarter of 1997. Data were supplemented with annual reports for some companies.

improvements in air pollution standards (Table A). The affordability of pollution control measures is not the real issue for these polluters. It is plainly a matter of priorities: spin control or pollution control; public relations, or pollution reduction. Thousands of lives stand in the balance.

Electric utilities are the main source of fine particulate pollution. They are also highly profitable and generate huge revenue streams each year. Average gross revenues at 83 of the top polluting power companies were \$165 billion in 1995-1996. Assuming

that this subset of utilities shoulders *all* of the costs of compliance with the new health standard, the annual gross revenues of the top polluting utilities is still 26 times more than the yearly costs of meeting the new particulate standard.

Congress Caves to Big Polluters

More than 100 members of Congress have signed letters to President Clinton from Representatives John, Boucher, or LaHood urging the Administration to weaken, delay, or even scrap the proposed health standard for fine particles. Our analysis of emis-

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Members of Congress representing big polluters are actively working against clean air.

sions data from EPA and the states shows that for all forms of particulate pollution, the pattern among signatories is the same: members of Congress representing big polluters are actively working against clean air.

Thirty (30) percent of the House signed these three critical letters opposing updated health standards. Polluters in the districts represented by the signatories account for 56 percent of all SO₂ pollution, 51 percent of all NO_X pollution and 45 percent of all direct particulate pollution.

For SO₂, members representing 19 of the top 25 top polluting districts have signed at least one of these three letters (Table B). For NO_X pollution, members representing 18 of the top 25 NO_X polluting districts have signed at least one of the three letters, as have 16 of the 25 members representing districts with the largest particulate polluters.

Particulate Pollution

Particulate pollution is the generic name for a broad class of toxic air pollution made up of substances that exist as discrete particles, suspended in the air in either liquid or solid form. "Particulate matter" can include various toxic metals such as lead, copper, nickel, zinc and cadmium, and fine aerosol particles formed in the atmosphere from sulfur and nitrogen oxides and volatile organic compounds (so-called particulate precursors) (EPA 1996c).

More than 15.5 million tons (31 billion pounds) of sulfur dioxide, 9 million tons (18 billion pounds) of nitrogen oxides, and 1.28 million tons (2.5 billion pounds) of airborne particles are poured into the atmosphere by industrial polluters each year.

Top Polluting Facilities

Sulfur Dioxide. All of the top 50, and 96 of the nation's top 100 SO₂ emitters are electric utilities; forty-five (45) of the top 50 are located east of the Mississippi River. The top SO₂ polluting facility in the country is PSI Energy in Princeton, Indiana (284,000 tons/year), followed by Indiana Kentucky Electric in Madison, Indiana (254,000 tons/year), and Illinois Power Company in Baldwin, Illinois (233,000 tons/year).

Nitrogen Oxides. All but two of the top 100 nitrogen oxide polluters are utilities; the two exceptions are a DuPont chemical plant in Orange Texas, and the ALCOA smelter in Rockdale, Texas. The top two stationary NO_X polluters are power plants run by the Tennessee Valley Authority (TVA). Number one is the TVA plant in Cumberland City, Tennessee (139,000 tons/year), and number two is the TVA facility in Muhlenberg County, Kentucky (105,000 tons/year).

Fine Particles. None of the top ten particulate polluters are utilities. Seven of the top ten are either metal mining or steel mills.

Table B. Most members of Congress who represent the biggest polluters oppose the EPA proposal.

Rank	Congressperson	Opposes Updated Air Standards	SO2 Emissions (tons)	Running Percent
1	Lee Hamilton (D-IN)		488,661	3.1%
2	Alan Mollohan (D-WV)	✓	484,202	6.3%
3	John Hostettler (R-IN)	✓	459,417	9.2%
4	John Murtha (D-PA)	✓	379,009	11.7%
5	John Shimkus (R-IL)	✓	357,976	14.0%
6	Ted Strickland (D-OH)	✓	350,738	16.2%
7	Jerry Costello (D-IL)	✓	319,805	18.3%
8	Jo Ann Emerson (R-MO)	✓	285,523	20.1%
9	Edward Whitfield (R-KY)	✓	285,458	22.0%
10	Robert Ney (R-OH)	✓	271,685	23.7%
11	Bob Barr (R-GA)		251,011	25.4%
12	Max Sandlin (D-TX)	✓	215,377	26.7%
13	James Davis (D-FL)		210,245	28.1%
14	Earl Pomeroy (D-ND)		209,451	29.4%
15	Jim Bunning (R-KY)	✓	193,315	30.7%
16	Frank Mascara (D-PA)	✓	189,993	31.9%
17	John Dingell (D-MI)		188,991	33.1%
18	Spencer Bachus (R-AL)	✓	188,083	34.3%
19	Bart Gordon (D-TN)	✓	183,979	35.5%
20	Steven LaTourette (R-OH)	✓	180,308	36.7%
21	Bob Wise (D-WV)	✓	179,754	37.8%
22	Ron Klink (D-PA)	✓	179,072	39.0%
23	Zach Wamp (R-TN)	✓	176,119	40.1%
24	Richard Burr (R-NC)	✓	175,408	41.3%
26	Dan Burton (R-IN)		171,485	42.4%

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain Database.

The top particulate polluter is the U.S. Steel Works in Gary, Indiana, with 51,700 tons of PM10 emissions, followed by the U.S. Army National Training Base in Fort Irwin, California at 28,000 tons of PM10, Columbia Gas Trans Corp in Standardsville, Virginia with 25,500 tons of PM10, LTV Steel

Mining in Hoyt Lakes, Minnesota with 21,600 tons of PM10, and Weirton Steel at 8,600 tons of total particulate emissions (*not* PM10).

Top Polluting States

Indiana and Illinois stand out as the greatest sources of all particulate related pollutants. Indi-

The top four corporate SO₂ polluters in the nation account for one quarter of all SO₂ emissions from stationary sources.

The top particulate polluter is a major steel company, USX.

Illinois is the top polluting state in two out of three categories (SO₂ and particulates); it is number two in NO_x emissions. Illinois is the only other state with emissions totals in the top three in all three pollutant categories, ranking number three in SO₂, number three in NO_x, and number two in direct particulate emissions. Texas is number one in NO_x pollution and number six in both particulate and SO₂ emissions, due to its heavy concentration of oil refineries, chemical plants, metal smelters, and natural gas fired utilities.

Top Polluting Parent Corporations

Sulfur Dioxide. Thirty-nine (39) of the top 40 corporate SO₂ polluters are electric power conglomerates. The one exception is the DuPont corporation, which ranks 37th nationally in SO₂ emissions.

The top four corporate SO₂ polluters in the nation account for one quarter of all SO₂ emissions from stationary sources. They are American Electric Power Company with 1.24 million tons per year, Southern Company with 932,000 tons per year, the Tennessee Valley Authority with 835,000 tons per year, and Cinergy Corporation, with 565,000 tons per year. Just 20 electric power utilities account for nearly one half of all stationary SO₂ emissions.

Chemical manufacturing, oil refining, pulp and paper milling,

and metal smelting are significant local and regional sources of SO₂, although facility level sources of these emissions tend to be smaller and more widely distributed than the massive power plants that top the list.

Nitrogen Oxides. Nine out of the top ten NO_x polluting corporations are electric power conglomerates, the sole exception being DuPont Corporation at number 10. These ten corporations account for one quarter of the nation's NO_x pollution from stationary sources. The top three parent company NO_x polluters are also the top three parent SO₂ polluters, the American Electric Power Company, with 492,000 tons, the TVA with 420,000 tons, and the Southern Company with 372,000 tons.

Fine Particles. Utilities do not dominate the top particulate polluters (Table 9). Thirty-four (34) of the top 50 particulate polluting corporations are not utilities. The top particulate polluter is a major steel company, USX, with 68,900 tons. Pulp and paper, steel milling, chemical manufacturing, metal smelting and oil refining corporations all rank in the top 25 corporate particulate polluters.

Costs Overstated — Benefits Understated

Experience shows that compliance costs for the particulate rule will be even less than the

EPA predicts. Historically, the EPA has understated the benefits and overestimated the costs of complying with most air pollution standards. For example, in 1990, the EPA estimated the costs of an allowance to emit a ton of sulfur dioxide at \$400 to \$800. The actual costs today are less than \$100.

Industry cost estimates have been even more wildly off the mark. On average, industry has overestimated the costs of pollution control by a factor of 14 in the last two major air quality rulemakings, based on actual costs of compliance (Browner 1997). Just as costs are chronically overestimated, the economic benefits of pollution control are systematically minimized. According to the EPA, the public health benefits of the proposed particle standard exceed the costs by a factor of ten — \$65 billion to \$140 billion per year in savings in health care and related expenses, compared to \$6.3 billion per year in pollution control costs. Yet even this ten to one benefits ratio understates the true economic value of the clean air that the standard will provide. For example, EPA benefits projections exclude the economic value of reduced lung and bronchial cancer incidence from cleaner air. A major eight year study by the California Air Resources Board released for public comment on May 13, 1997, linked as many as 2,000 cancer deaths per year in California with particulates in diesel exhaust alone (CARB). In addi-

tion, the EPA assigns zero economic value to the dramatically improved visibility in National Parks that will result from the rule.

Recommendations

On March 20, 1997, 1,375 medical professionals registered their support for the EPA proposal in a letter to President Clinton. According to these medical experts, tens of thousands of premature deaths and hospitalizations could be prevented each year by implementing more stringent air quality standards. Indeed, these medical authorities emphasized to the President that even under the EPA proposal “millions of people could still be exposed to harmful levels of particulate pollution”. The letter then urges the President “to direct EPA to adopt air pollution standards *that are at least as protective as those proposed*”, [emphasis added]

President Clinton and EPA Administrator Browner should listen to the public health community and medical experts, not the polluters or their so-called independent experts. Congress, in turn, must not cave to corporate lobbying or public relations campaigns.

More Protective Health Standards. The Clinton Administration’s proposed PM 2.5 standard for fine particles represents a significant improvement in the status quo. But in order to fully protect the public health, and particularly the health of the most vulnerable individuals in the population, the proposal must be strengthened.

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In contrast, EPA benefits projections exclude the economic value of reduced lung and bronchial cancer incidence from cleaner air.

President Clinton and EPA Administrator Browner should listen to the public health community and medical experts, not the polluters or their so-called independent experts.

We recommend an annual average PM_{2.5} standard of 10ug/m³, and a 24 hour PM 2.5 standard of 20ug/m³.

Close Monitoring Loopholes.

The agency's proposed multi-monitor averaging scheme for compliance with the annual standard, and its proposal to enforce the daily standard at the 98th percentile of high pollution days, undermine the clear potential public health benefits of the proposed standard. We recommend, instead, that the agency retain current monitoring and enforcement procedures. At the same time, we support the agency's desire to expand and

update the ambient air monitoring network. Additional monitoring must not be used, however, to gloss over areas of persistent high pollution.

Right to Know. The public has a fundamental right to know about pollution in the air they breathe. We recommend, therefore, that the EPA better maintain data on emissions, and that the agency make available on the World Wide Web, data on both emissions and air pollution levels for entire United States, in a manner consistent with data already available from the Toxics Release Inventory.

Introduction

In November 1996, the EPA proposed to update the decade-old health standards for particulate pollution, or microscopic soot, in the air we breathe. This highly hazardous class of air pollutants can include various toxic metals such as lead, copper, nickel, zinc and cadmium, and fine aerosols formed from sulfur and nitrogen oxides and organic compounds such as phenols (EPA 1996a, EPA 1996c). These tiny toxic particles in the air we breathe cause the premature death of tens of thousands of people each year.

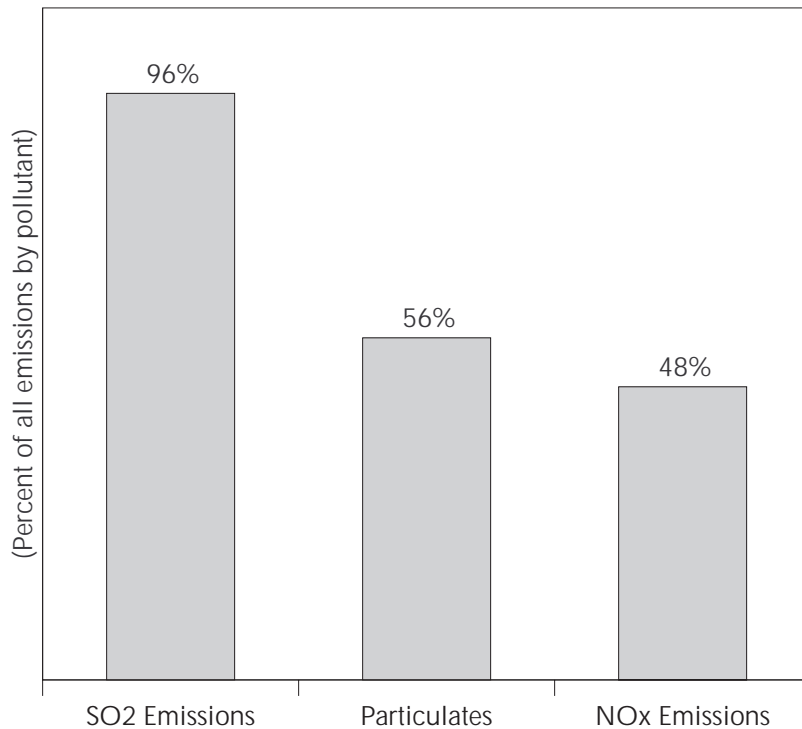
Even before the Clinton Administration announced this proposal, major polluters, under the guise of their front group, Citizens For a Sound Economy (CSE), launched a multi-million dollar public relations campaign to discredit the EPA's efforts and stop any potential improvements in air quality standards. Not unwisely, these corporations reasoned that it was more cost effective to buy public opinion and influence the Congress with slick PR, than to buy the pollution control equipment that may be required by the rule. A list of members of the National Association of Manufacturers is included in the Appendix.

The strategy behind this public relations effort is to divert attention from the polluters themselves and to foster an image of pervasive big government, eager to strangle small business with needless regulations, meddle in people's lives and restrict personal activities. To this end top officials from major polluting corporations, their trade associations, and their lobbyists have gone so far as to hold press events with barbecues blazing, claiming that individuals are actually the largest source of pollution, and that cleaner air means that people will need a pollution permit just to fire up the Hibachi. Nothing could be further from the truth.

The fact is that industrial polluters, utilities, and manufacturers account for more than one half (56 percent) of all traditionally inventoried particulate pollution (EPA 1996e), an unusually hazardous form of air pollution that causes the premature death of tens of thousands of people each year (NRDC 1996, EPA 1993, EPA 1997). For SO₂ and NO_x, the particulate precursors that form deadly fine aerosols, stationary sources account for 96 percent and 48 percent respectively (EPA 1996e) (Figure 1).

Not unwisely, major polluting corporations reasoned that it was more cost effective to buy public opinion and influence the Congress with slick PR, than to buy the pollution control equipment that may be required by the rule.

Figure 1. Power companies and industry cause most deadly fine particle pollution.



Source: Environmental Working Group, compiled from EPA, 1996c.

If anyone is compromising personal freedom, it is the hugely profitable major corporations, power plants, steel mills and others who dump millions of tons of pollutants into the atmosphere that exacerbate asthma, aggravate emphysema and heart disease, contribute to lung and bronchial cancer, and cause tens of thousands of premature deaths each year. Family fun like fireworks and barbecues contribute such a minuscule portion of the overall particulate load, that no federal or state regulatory agency has ever even bothered to estimate the actual

contribution they make to air pollution, much less contemplate subsequent regulations. Likewise, small businesses are nowhere near the top of any sensible regulatory scheme to control particulate pollution.

According to EPA Administrator, Carol Browner, suggestions that air standards would mean regulation of barbecues “are nothing more than scare tactics. This is not about backyard barbecues. This is not about banning fireworks” (Hebert, 1997), “It is about whether our children will be able to go outside on the Fourth of July and enjoy those fireworks (Browner, 1997a).”

As this report shows, the majority of the major particulate polluters are highly profitable corporations and utilities, run by generously compensated executives. While industry belabors the extreme costs of reducing air pollution to safe levels, the public and the Congress are generally unaware of the following facts:

- Many top polluting, coal-fired, midwestern power plants were largely exempt from the pollution control requirements of the 1990 Clean Air Act Amendments.
- Profits (net income) from the top particulate polluters in the past two years averaged 11 times EPA’s projected costs of compliance with the proposed particulate rule.

- Sales (gross revenue) for the same polluters averaged \$1.2 *trillion* over the past two years, more than 200 times EPA's estimated costs of implementing the new health standard.
- EPA cost estimates have exceeded the actual costs of compliance by at least a factor of two in every major air pollution regulation issued in the past decade.

The affordability of pollution control measures is not the real issue for these polluters. It is plainly a matter of priorities: spin control or pollution control; public relations, or pollution reduction. Thousands of lives stand in the balance.

Fine Particulates

Particulate matter is the generic name for a broad class of toxic air pollution made up of substances that exist as discrete particles, suspended in the air in either liquid or solid form. "Particulates" can include various toxic metals such as lead, copper, nickel, zinc and cadmium, and fine aerosol particles formed from sulfur and nitrogen oxides and organic compounds such as phenols (EPA 1996c). The current EPA particulate standard, referred to as the PM10 standard, regulates particles smaller than 10 microns in diameter. A micron is one millionth of a meter, roughly one 70th the width of a human hair.

Particles less than 10 microns in diameter, including windblown dust, and agriculturally generated particles, were targeted in the past because these small particles can penetrate into the deepest regions of the lungs (Bascom et al. 1996). More recent data show, however, that smaller particles, less than 2.5 μm in diameter (PM2.5), present the greatest risk to human health (EPA 1996c). Indeed, epidemiological studies from many U.S. cities confirm the hazards of breathing fine particles (PM2.5) at concentrations typically found in ambient air in U.S. cities (EPA 1996c). As a result, regulatory and public health initiatives have shifted away from the larger dust particles to the smaller material that comes from combustion and other industrial activity.

There are two basic sources of fine particulate pollution:

- 1) Direct releases of fine particles, or primary particles, reported as total particulates or PM10 (in rare cases PM2.5). Primary particles include elemental carbon and metals, soil, dust and soot, and are typically emitted by coal fired power plants, steel mills, diesel engines, and other coal and oil burning industrial processes.
- 2) Secondary particles, are formed after a series of chemical reactions in the atmosphere transform "particulate precursors", sulfur dioxide, nitrogen oxides, and volatile organic compounds into fine aerosols. Fine aerosol precursors are spewed into the atmo-

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Table 1. Particulate pollution is a serious problem in most of the United States, but its composition varies among regions.

Component	Eastern U.S. Urban Areas	Western U.S. Urban Areas
Sulfates	47%	15%
Nitrates	1%	16%
Organic Carbon	21%	39%
Other	31%	31%

Source: Adapted from EPA 1996c. Values may not add to 100 due to rounding.

Particulate aerosols in urban areas are frequently associated with toxic metals which are believed to condense onto the particles following combustion.

sphere from power plants, oil refineries, steel mills, cars and trucks, and other manufacturing and industrial facilities.

Microscopic particles formed from precursors include ammonium nitrate aerosols, ammonium sulfate aerosols, and organic aerosols derived from volatile organic compounds (VOCs). Fine aerosols, or secondary particles, comprise a substantial portion of all particulate pollution. The composition of the overall particle/aerosol load, however, varies from place to place and over time. On average, sulfates comprise about 15 percent of the total PM_{2.5} levels in the west, compared to nearly 50 percent in eastern states where coal-fired power plants still loom as major air polluters. Many coal-fired power plants were largely exempted from the pollution control requirements of the 1990 Clean Air Act Amendments. In western states, nitrates comprise 15 percent of PM_{2.5} levels, as opposed just 1 percent in the east (Table 1, EPA 1996c).

Particulate aerosols in urban areas are frequently associated with toxic metals which are believed to condense onto the particles following combustion (EPA 1996a). Indeed, the primary pollution sources of the aerosol particulate precursors are also huge sources of toxic metals in the air. Coal and oil fired power plants, steel mills, incinerators, oil refineries, cement plants and other industries send tons of lead, manganese, chromium, nickel, and arsenic, to name a just a few toxic metals, into the air each year (EPA 1996a). An analysis of air pollution in Los Angeles identified 30 elements and 19 VOC's attached to airborne particulate matter (NRDC 1996).

In addition to aerosols, elemental carbon, a product of incomplete combustion, is emitted in very fine particles that are about 0.1 micron in diameter. Nationwide, diesel engines account for about half of this microscopic soot; in some airsheds, for example Los Angeles, as much as 93 percent of all elemental carbon particulates are from diesel trucks, buses and cars. Elemental carbon particulates are especially troubling because they readily adsorb and concentrate highly hazardous toxic chemicals spewed into the air largely from industrial sources, and carry them deep into the lungs (NRDC 1996). In fact, an eight year study recently released for public comment by the California Air Resources Board linked ambient levels of diesel exhaust particles to thou-

sands of cancer cases each year in California (CARB 1997).

Particulates Shorten Lives

The science supporting the hazards of breathing particulate pollution is exceptionally powerful and consistent. According to the U.S. EPA, more than 60 peer-reviewed community epidemiological studies have found positive, statistically significant associations between short and long term concentrations of various PM indicators (total particulates, PM₁₀, PM_{2.5}) and death and morbidity (EPA 1996c). The proposed standards are not, as industry puts it, based on only one study that is rife with confounding factors. Indeed, polluter criticism of EPA science sounds strikingly like the tobacco industry pontificating on the “uncertain” health consequences of smoking.

The Surgeon General first cautioned the American public against smoking in the early 1960’s, and public health authorities have conducted aggressive campaigns to reduce smoking since that time. Only recently, however, have scientists discovered some of the precise mechanisms by which smoking kills its victims. Particulate pollution is in many ways the cigarette of the 1990’s. Although scientists have not yet identified a precise mechanism by which these particles increase death rates, there is a virtual scientific consensus that *even at the lowest levels measured*, particulates

cause an increase in cardiopulmonary death, asthma, and other human health problems. Polluters have criticized EPA’s science as not “sound”, arguing that other pollutants may cause premature death, and that the relative contribution to increased mortality rates of these confounding factors have not been sorted out. Industry claims, however, are based on outdated studies. Indeed, more recent studies (Ostro 1993, Schwartz 1994, Dockery and Pope, 1994, and Pope et al. 1995) have significantly strengthened the conclusion that fine particulates, not other pollutants, are causing the premature death and increased illness found in these studies.

Regardless of the type or level of co-pollutants involved, the most recent studies clearly show that mortality rates consistently correlate with fluctuations of particulate levels in the air. Further, the actual types of health effects linked to particulate exposure are consistent between mortality and morbidity data: particulate levels in the air are closely linked with increases in respiratory and cardiovascular related hospital admissions, as well as death rates from lung and heart disease (EPA 1996c). In addition, studies of both short and long term exposure to particulate levels have shown strong associations between increases in mortality and morbidity rates. This concordance strengthens the conclusion that particulates shorten lives by several years for the average affected individuals (EPA 1996a).

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EPA's estimates, however, understate the actual benefit of the proposed rule, and the current level of mortality caused by particulate pollution. First, EPA's benefits estimates do not include lives that would be saved by the proposed standard as a result of

reductions in lung and bronchial cancer rates. A major eight year study by the California Air Resources Board (CARB) released for public comment on May 13, 1997, linked as many as 2,000 cancer deaths per year in California alone with particulates in diesel exhaust alone (CARB 1997).

Second, the standard will ensure that other sources of pollution do not wipe out the gains projected to be achieved through SO₂ controls on utilities (such as 20,000 lives saved). Without the proposed new particulate standard, if pollution levels do not drop to projected levels when utility emissions are reduced, the public and air quality officials will lose the most powerful legal mechanism available to lower air pollution to the levels needed to make the air safe to breathe.

Top Polluters

Our analysis of top particulate polluters includes emissions of both particulate pollution reported as PM10 or total suspended particulates (TSP), and two major particulate precursors sulfur dioxide and nitrogen oxides. Only stationary pollution sources (factories, coal-burning electric utilities, steel mills, etc., but not cars and trucks) were included in the report. Stationary sources account for 96 percent of all SO₂ pollution, nearly 50 percent of NO_x pollution, and 56 percent of all traditionally monitored particulate pollution.

The EPA and the states have assembled more than enough information on air pollution levels and emissions sources to support the proposed particulate standard. The majority of the data used in this study are from the EPA Aerometric Information Retrieval System (AIRS). Because the AIRS database lacks recent data on emissions for some major criteria pollutants for about 15 states, EWG obtained these data directly from state agencies. Our research showed that many states do not report pollution monitoring data to the EPA, and some

others simply do not monitor polluters effectively.

Lack of current *emissions* reporting data from the states should not be construed as a lack of air pollution monitoring data. The EPA does maintain reasonable information on ambient air pollution levels in most metropolitan areas. While the EPA air monitoring should be improved, these improvements will not likely identify any major new sources of pollution. Rather, they can help EPA most efficiently target pollution reduction efforts.

The public has a right to know the identity, location, and amount of air pollution from all sources that may affect their health and the health of their families. EPA should act to protect that right by maintaining up-to-date information on air emissions, and by adequately monitoring air pollution in major metropolitan areas (EWG 1997). To implement the proposed particulate standard and guard the public's right to know, EPA must obtain, maintain, and routinely update a reasonably accessible on-line data base of PM 2.5, SO₂ and NO_x emissions from all major pollution sources. As an interim step,

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To prepare this analysis, EWG contacted 15 states in an effort to obtain the most up-to-date emissions monitoring data for particulates and particulate precursors to supplement the AIRS database. We obtained pollution data from 12 of them (Table 2). We then combined these data with information reported to the EPA by the other 35 states with up to date data submissions in the AIRS Air Facility Subsystem (AIRS-AFS). Many other states were contacted for quality assurance.

The data used for this analysis are from 1994, 1995 or 1996, unless otherwise indicated. Some states (Massachusetts, Rhode Island, Georgia and Iowa) could not provide information on SO₂, particulate, and nitrogen oxide emissions more recent than 1990. For power plants in these states, we used 1995 emissions data from EPA's Title IV database, a database of SO₂ and NO_x emissions from major utilities being regulated under the acid rain provisions of the Clean Air Act. In other cases, after repeated calls to state environmental officials, nine states could not provide PM 10 data for all facilities, but instead provided only information on total particulate emissions. When these data were from 1994 or a more recent year, they are presented in the analysis and are marked with an asterisk in the tables. Total particulate data from prior to 1992 were not used in the national report.

Table 2. Data sources used in this report.

Alabama	AIRS
Alaska	AIRS
Arizona	AIRS
Arkansas	AIRS
California	State
Colorado	AIRS
Connecticut	State
Delaware	State
District Of Columbia	AIRS
Florida	State
Georgia	State, AIRS, Title IV
Hawaii	AIRS
Idaho	State, AIRS
Illinois	AIRS
Indiana	AIRS
Iowa	AIRS, Title IV
Kansas	AIRS
Kentucky	State
Louisiana	State
Maine	State
Maryland	AIRS
Massachusetts	State, AIRS, Title IV
Michigan	State
Minnesota	AIRS
Mississippi	State, AIRS
Missouri	State
Montana	AIRS
Nebraska	State
Nevada	State
New Hampshire	AIRS
New Jersey	State
New Mexico	AIRS
New York	State
North Carolina	State
North Dakota	AIRS
Ohio	State
Oklahoma	AIRS
Oregon	AIRS
Pennsylvania	State
Rhode Island	AIRS, Title IV
South Carolina	State
South Dakota	AIRS
Tennessee	State
Texas	State, AIRS
Utah	AIRS
Vermont	AIRS
Virginia	AIRS
Washington	AIRS
West Virginia	State
Wisconsin	AIRS
Wyoming	AIRS

*AIRS: Aerometric Information Retrieval System - EPA's air pollution database.
 State: Data acquired from relevant state agency.
 Title IV: Electric Utility Emissions data - EPA Acid Rain Program.*

States

Sulfur Dioxide. More than 15.5 million tons (31 billion pounds) of sulfur dioxide are poured into the atmosphere each year by coal-fired utilities, steel mills, and other large industrial facilities. Emissions sources are concentrated in the Midwest and Ohio River Valley. Facilities in just four adjacent states — Illinois, Indiana, Ohio and Pennsylvania, — accounted for one third of the nation's SO₂ pollution in 1995, with each state reporting more than one million tons of sulfur dioxide emissions that year (Table 3). Polluters in just eight states account for half of all SO₂ pollution from stationary sources, while the top ten states account for 61 percent of all SO₂ pollution. Half of the 50 states account for almost all (91 percent) of sulfur dioxide pollution each year.

In all of the top ten states, utilities are the dominant source of SO₂ emissions. In some Midwestern and Ohio River Valley states, however, steel mills contribute significant additional amounts of sulfur dioxide pollution.

Nitrogen Oxide. Just over 9 million tons (18 billion pounds) of nitrogen oxides are emitted from coal and natural gas powered utilities, steel mills, smelters, chemical plants, and other stationary industrial polluters each year. Five states, Texas, Indiana, Illinois, Ohio, and

Table 3. Four states produce one third of all SO₂ emissions.

Rank	State	SO ₂ Emissions		
		Total (Tons)	National Percentage	Running Percentage
1	Indiana	1,521,033	9.8%	9.8%
2	Pennsylvania	1,288,934	8.3%	18.1%
3	Illinois	1,210,265	7.8%	25.9%
4	Ohio	1,151,320	7.4%	33.3%
5	Texas	863,558	5.6%	38.9%
6	Florida	809,672	5.2%	44.1%
7	Missouri	723,009	4.7%	48.8%
8	West Virginia	666,138	4.3%	53.1%
9	Alabama	647,192	4.2%	57.2%
10	Tennessee	610,315	3.9%	61.2%
11	Kentucky	600,903	3.9%	65.0%
12	Michigan	546,203	3.5%	68.6%
13	Georgia	480,785	3.1%	71.7%
14	North Carolina	445,995	2.9%	74.5%
15	New York	331,037	2.1%	76.7%
16	Virginia	306,993	2.0%	78.6%
17	Louisiana	293,129	1.9%	80.5%
18	Wisconsin	282,439	1.8%	82.4%
19	Maryland	267,128	1.7%	84.1%
20	South Carolina	226,957	1.5%	85.5%
21	North Dakota	209,451	1.3%	86.9%
22	New Mexico	174,113	1.1%	88.0%
23	Oklahoma	152,979	1.0%	89.0%
24	Massachusetts	151,125	1.0%	90.0%
25	Arizona	136,918	0.9%	90.9%
26	Wyoming	130,214	0.8%	91.7%
27	Kansas	119,054	0.8%	92.5%
28	Minnesota	113,885	0.7%	93.2%
29	Washington	109,373	0.7%	93.9%
30	Colorado	106,771	0.7%	94.6%
31	Arkansas	99,083	0.6%	95.2%
32	Delaware	93,656	0.6%	95.8%
33	Nebraska	67,914	0.4%	96.3%
34	New Hampshire	61,807	0.4%	96.7%
35	Mississippi	56,590	0.4%	97.0%
36	Montana	54,184	0.3%	97.4%
37	Utah	53,963	0.3%	97.7%
38	Nevada	49,064	0.3%	98.0%
39	New Jersey	47,254	0.3%	98.3%
40	Maine	42,954	0.3%	98.6%
41	California	41,698	0.3%	98.9%
42	Connecticut	33,547	0.2%	99.1%
43	South Dakota	33,236	0.2%	99.3%
44	Hawaii	32,679	0.2%	99.5%
45	Iowa	22,193	0.1%	99.7%
46	Idaho	19,216	0.1%	99.8%
47	Alaska	12,925	0.1%	99.9%
48	Oregon	10,689	0.1%	100.0%
49	Rhode Island	2,757	0.0%	100.0%
50	Vermont	2,231	0.0%	100.0%
51	District Of Columbia	1,950	0.0%	100.0%
	Totals	15,516,477		

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain Database.

Table 4. Four states produce more than one quarter of all stationary NOx emissions.

Rank	State	NOx Emissions		
		Total (Tons)	National Percentage	Running Percentage
1	Texas	930,210	10.2%	10.2%
2	Indiana	534,874	5.9%	16.1%
3	Illinois	530,083	5.8%	21.9%
4	Ohio	508,933	5.6%	27.5%
5	Pennsylvania	417,374	4.6%	32.1%
6	Michigan	414,878	4.6%	36.7%
7	Louisiana	414,148	4.6%	41.3%
8	Florida	398,555	4.4%	45.6%
9	Tennessee	319,644	3.5%	49.2%
10	Kentucky	315,144	3.5%	52.6%
11	West Virginia	312,858	3.4%	56.1%
12	Alabama	304,705	3.4%	59.4%
13	Missouri	290,658	3.2%	62.6%
14	North Carolina	273,105	3.0%	65.6%
15	Georgia	255,672	2.8%	68.4%
16	Kansas	192,719	2.1%	70.5%
17	Oklahoma	171,059	1.9%	72.4%
18	Virginia	168,804	1.9%	74.3%
19	New Mexico	168,345	1.9%	76.1%
20	Wisconsin	168,185	1.8%	78.0%
21	New York	153,647	1.7%	79.7%
22	Minnesota	151,700	1.7%	81.3%
23	California	139,775	1.5%	82.9%
24	South Carolina	136,644	1.5%	84.4%
25	Colorado	134,888	1.5%	85.9%
26	Maryland	132,894	1.5%	87.3%
27	Wyoming	132,840	1.5%	88.8%
28	North Dakota	115,982	1.3%	90.1%
29	Arkansas	106,453	1.2%	91.2%
30	Arizona	103,621	1.1%	92.4%
31	New Jersey	66,155	0.7%	93.1%
32	Utah	62,604	0.7%	93.8%
33	Nebraska	61,615	0.7%	94.5%
34	Massachusetts	58,232	0.6%	95.1%
35	Washington	57,217	0.6%	95.7%
36	Delaware	49,005	0.5%	96.3%
37	Montana	48,455	0.5%	96.8%
38	Mississippi	45,485	0.5%	97.3%
39	Nevada	43,627	0.5%	97.8%
40	Alaska	35,106	0.4%	98.2%
41	Hawaii	30,486	0.3%	98.5%
42	Maine	24,922	0.3%	98.8%
43	New Hampshire	23,489	0.3%	99.0%
44	Oregon	23,291	0.3%	99.3%
45	South Dakota	19,348	0.2%	99.5%
46	Connecticut	16,093	0.2%	99.7%
47	Idaho	15,754	0.2%	99.9%
48	Iowa	6,234	0.1%	99.9%
49	Rhode Island	2,355	0.0%	100.0%
50	Vermont	2,029	0.0%	100.0%
51	District Of Columbia	1,719	0.0%	100.0%
	Totals	9,091,617		

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain Database.

Pennsylvania account for nearly one third of all nitrogen oxides emissions. Four of these top five states — Indiana, Illinois, Ohio, and Pennsylvania — are also the top SO2 polluting states in the nation, with the same power plants providing the lions share of the pollution (Table 4).

Texas tops the list of NOX polluting states due to its relatively unique concentration of heavy industry and natural gas powered utilities. The top five NOX polluters in Texas are a DuPont chemical plant in Orange (the largest non-utility NOX polluter in the nation), two natural gas powered electric generating stations operated by Houston Power and Light, another natural gas utility operated by Texas Utilities Electric Company, and an aluminum smelter owned by Aluminum Company of America (ALCOA).

Fine Particles. The top particulate polluting states are a different mix than the top NOX and SO2 states (Table 5). As with SO2 emissions, Indiana is home to the top total particulate polluters in the nation. Illinois, which was number three in SO2, is number two in particulates. The next three top particulate polluting states, Minnesota, Georgia, and California, however, are not in the top ten in either SO2 or NOX emissions, reflecting the different sources of direct particulate pollution as compared to SO2 and NOX.

Large emitters of PM 10 are oil refineries, steel mills, pulp and

paper mills, chemical plants, smelters, and utilities. Emissions are concentrated in a small number of states, but not the same states as SO₂ and NO_x. Six states account for one third, and ten states account for just over 50 percent of all direct particulate pollution.

Summary. Indiana and Illinois stand out as the greatest source of all particulate related pollutants. Indiana is the top polluting state in two out of three categories (SO₂ and particulates); it is number two in NO_x emissions. Illinois is the only other state with emissions totals in the top three in all three pollutant categories, ranking number three in SO₂, number three in NO_x, and number two in direct particulate emissions.

Indiana and Illinois are the top polluting states due to their unique combination of coal burning power plants and heavy industry such as steel mills. Texas is number one in NO_x pollution and number six in both particulate and SO₂ emissions, due to its heavy concentration of oil refineries, chemical plants, and natural gas fired utilities.

In states not dominated by coal and gas-fired utilities such as California and Texas, oil refining, metal smelters, chemical plants, and pulp and paper mills emerged as significant local and regional sources of SO₂, NO_x, and particulate pollution.

Table 5. Four states produce more than one quarter of all particulate matter emissions.

Rank	State	Particulate Emissions		
		Total (Tons)	National Percentage	Running Percentage
1	Indiana	96,877	7.5%	7.5%
2	Illinois	91,977	7.2%	14.7%
3	Minnesota	72,869	5.7%	20.4%
4	Georgia	65,617	5.1%	25.5%
5	California	54,830	4.3%	29.8%
6	Texas	50,783	4.0%	33.7%
7	Pennsylvania	50,124	3.9%	37.6%
8	Virginia	47,116	3.7%	41.3%
9	Ohio	45,286	3.5%	44.8%
10	Alabama	44,810	3.5%	48.3%
11	Florida	43,536	3.4%	51.7%
12	Louisiana	41,999	3.3%	54.9%
13	Arkansas	39,472	3.1%	58.0%
14	Wyoming	34,138	2.7%	60.7%
15	Tennessee	33,102	2.6%	63.3%
16	Missouri	32,701	2.5%	65.8%
17	Kansas	32,324	2.5%	68.3%
18	North Carolina	31,931	2.5%	70.8%
19	West Virginia	26,939	2.1%	72.9%
20	Colorado	23,665	1.8%	74.7%
21	Arizona	22,256	1.7%	76.5%
22	Kentucky	22,255	1.7%	78.2%
23	New York	21,002	1.6%	79.8%
24	Nebraska	20,172	1.6%	81.4%
25	Oklahoma	19,592	1.5%	82.9%
26	South Carolina	18,762	1.5%	84.4%
27	Idaho	18,727	1.5%	85.9%
28	Utah	18,015	1.4%	87.3%
29	Michigan	16,210	1.3%	88.5%
30	Washington	15,310	1.2%	89.7%
31	Wisconsin	14,891	1.2%	90.9%
32	New Jersey	14,100	1.1%	92.0%
33	New Mexico	12,617	1.0%	92.9%
34	Oregon	11,083	0.9%	93.8%
35	Montana	11,008	0.9%	94.7%
36	Maryland	10,434	0.8%	95.5%
37	Mississippi	10,326	0.8%	96.3%
38	Massachusetts	7,477	0.6%	96.9%
39	Maine	6,846	0.5%	97.4%
40	North Dakota	5,541	0.4%	97.8%
41	Alaska	5,284	0.4%	98.2%
42	Hawaii	5,154	0.4%	98.6%
43	Nevada	4,192	0.3%	99.0%
44	Iowa	3,619	0.3%	99.3%
45	New Hampshire	3,413	0.3%	99.5%
46	Delaware	1,833	0.1%	99.7%
47	South Dakota	1,412	0.1%	99.8%
48	Vermont	1,022	0.1%	99.8%
49	Connecticut	928	0.1%	99.9%
50	Rhode Island	902	0.1%	100.0%
51	District Of Columbia	112	0.0%	100.0%
	Totals	1,284,591		

Source: Environmental Working Group. Compiled from U.S. EPA and state agency data.

Table 6. Top SO2 polluting facilities in the United States.

Rank	Name	Location	SO2 (tons/year)	Year	Type of Industry
1	PSI Energy Gibson	Princeton, IN	284,497	94	Electric Services
2	Indiana Kentucky Electric Corp	Madison, IN	254,056	94	Electric Services
3	Illinois Power Co Baldwin Power Plant	Baldwin, IL	233,768	95	Electric Services
4	Associated Electric Coop	Marston, MO	222,084	95	Electric Services
5	Central Illinois Public Service	Coffeen, IL	181,391	95	Electric Services
6	TVA	Muhlenberg County, KY	172,110	96	Electric Services
7	Ga Power Co Bowen Stm Elec Gen Sta	Taylorville, GA	160,653	95	Electric Services
8	Teco Big Bend Sta	Ruskin, FL	158,905	94	Electric Services
9	West Penn Power Co	Greensburg, PA	158,904	95	Electric Services
10	Alabama Power Co Ec Gaston	Wilsonville, AL	156,480	95	Electric Services
11	Pa Elec Co Keystone	Johnstown, PA	145,165	95	Electric Services
12	Detroit Edison Co	Monroe, MI	143,733	95	Electric Services
13	Sigeco Warrick Pwr Plant Alcoa Generatng	Newburgh, IN	131,460	94	Electric Services
14	Com Ed Kincaid Generating Station	Kincaid, IL	129,405	95	Electric Services
15	Union Electric Co	Labadie, MO	128,805	95	Electric Services
16	TVA Johnsonville Steam Plant	New Johnsonville, TN	126,367	96	Electric Services
17	Ohio Power Kammer Plant	Moundsville, WV	124,971	95	Electric Services
18	American Electric Power	Lawrenceburg, IN	121,146	94	Electric Services
19	Pa Elec Co	Homer City, PA	120,558	95	Electric Services
20	Cardinal Operating Co	Brilliant, OH	118,844	95	Electric Services
21	Alabama Power Gorgas	Parrish, AL	117,519	95	Electric Services
22	CEI Eastlake	Willoughby, OH	117,377	95	Electric Services
23	TVA Gallatin Steam Plant	Gallatin, TN	116,665	96	Electric Services
24	Muskingum River Plant	Beverly, OH	112,517	95	Electric Services
25	PP&L Montour SES	Derry Twp, PA	112,044	94	Electric Services
26	PSI Energy Cayuga	Cayuga, IN	107,569	94	Electric Services
27	Columbus Southern Power Conesville	Conesville, OH	107,535	95	Electric Services
28	TVA Kingston Steam Plant Kingston	Kingston, TN	105,188	96	Electric Services
29	James M Stuart Elec Generating Station	Aberdeen, OH	99,571	95	Electric Services
30	Virginia Power Mount Storm	Mount Storm, WV	94,111	95	Electric Services
31	Ipalco Petersburg	Petersburg, IN	93,914	94	Electric Services
32	Kyger Creek Station Ohio Valley Elec Cor	Cheshire, OH	92,806	95	Electric Services
33	PP&L Brunner Island	York Haven, PA	92,457	94	Electric Services
34	Texas Utilities Electric Co	Tatum, TX	89,294	96	Electric Services
35	Pa Elec Co	West Wheatfield Twp, PA	89,006	95	Electric Services
36	Electric Energyinc Joppa Steam Ele Stn	Joppa, IL	87,890	95	Electric Services
37	Duke Power Marshall Plt	Terrell, NC	85,585	95	Electric Services
38	CP&L Roxboro	Raleigh, NC	82,453	95	Electric Services
39	Florida Power	Crystal River, FL	81,710	94	Electric Services
40	Ga. Power Co Branch Stm Elec Gen Sta	Milledgeville, GA	81,459	95	Electric Services
41	American Municipal Power Ohioinc	Marietta, OH	81,254	95	Electric Services
42	Pa. Power Co	West Pittsburgh, PA	79,038	95	Electric Services
43	Salt River Project Navajo Station	Page, AZ	76,218	90	Electric Services
44	Detroit Edison Co	St Clair, MI	75,257	95	Electric Services
45	TVA John Sevier Steam Plant	Rogerville, TN	75,022	96	Electric Services
46	TVA Colbert	Tuscumbia, AL	72,600	95	Electric Services
47	Kentucky Power Co	Ashland, KY	71,805	96	Electric Services
48	Appalachian Power Co John E Amos Plant	St. Albans, WV	70,100	95	Electric Services
49	Monongahela Power Fort Martin	Maidsville, WV	70,085	95	Electric Services
50	Pacific Power	Centralia, WA	67,435	94	Electric Services

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain database.

Top Polluting Facilities

Sulfur Dioxide. All of the top 50, and 96 of the nation's top 100 SO₂ emitters are electric utilities; forty five (45) of the top 50 are located east of the Mississippi River (Table 6). The top SO₂ polluting facility in the country is PSI Energy in Princeton, Indiana (284,000 tons/year), followed by Indiana Kentucky Electric in Madison, Indiana (254,000 tons/year), and Illinois Power Company in Baldwin, Illinois (233,000 tons/year).

The four sulfur dioxide polluters in the top one hundred that are not utilities are the ALCOA facility in Rockdale, Texas: Asarco Corporation (Smelter) in Annapolis, Missouri: Shell Oil in Hartford, Illinois: and the Dakota Gasification Company.

Nitrogen Oxides. All but two of the top 100 nitrogen oxide polluters are utilities (Table 7); the two exceptions are a DuPont chemical plant in Orange, Texas, and the ALCOA smelter in Rockdale, Texas. The top two stationary NO_x polluters are power plants run by the Tennessee Valley Authority (TVA). Number one is the TVA plant in Cumberland City, Tennessee (139,000 tons/year), and number two is the TVA facility in Muhlenberg County, Kentucky (105,000 tons/year).

Fine Particles. Three of the top five particulate polluters in

the nation are steel mills (Table 8). The top particulate polluter is the U.S. Steel Works in Gary, Indiana, with 51,700 tons of PM₁₀ emissions, followed by the U.S. Army National Training Base in Fort Irwin, California at 28,000 tons of PM₁₀, Columbia Gas Trans Corp in Standardsville, Virginia with 25,500 tons of PM₁₀, LTV Steel Mining in Hoyt Lakes, Minnesota with 21,600 tons of PM₁₀, and Weirton Steel at 8,600 tons of total particulate emissions (*not* PM₁₀).

Summary. Utilities dominate emissions of particulate precursors SO₂ and NO_x and contribute to huge pollution problems in the entire eastern half of the United States. Often this pollution is most hazardous to human health, far from the community and even the state from which the pollution emanates.

Huge coal fired utilities elevate the background levels of deadly fine aerosol particulates on most of the east coast and particularly the Northeastern states. Indeed, for many New England and Mid-Atlantic states, utilities in the Ohio River Valley and the Midwest are the most significant source of PM_{2.5}. In other metropolitan areas, these utilities compound severe particulate pollution problems caused by localized concentrations of polluting industries in places like Philadelphia, with its concentration of oil refineries, or Northern New Jersey and New York City, where a combination of chemical manufacturing, oil refining, and diesel

For many New England and Mid-Atlantic states, utilities in the Ohio River Valley and the Midwest are the most significant source of PM_{2.5}.

Table 7. Top NOx polluting facilities in the United States.

Rank	Name	Location	NOx Emissions (tons/year)	Year	Industry
1	TVA Cumberland Steam Plant	Cumberland City, TN	139,056	96	Electric Services
2	TVA	Muhlenberg County, KY	105,120	96	Electric Services
3	Associated Electric Coop	Marston, MO	94,716	95	Electric Services
4	Indiana Kentucky Electric Corp	Madison, IN	74,136	94	Electric Services
5	General James M Gavin Plant	Gallipolis, OH	73,848	95	Electric Services
6	Com Ed Powerton Station	Pekin, IL	72,628	95	Electric Services
7	Detroit Edison Belle River	St. Clair, MI	71,470	95	Electric Services
8	E I Du Pont De Nemours & Co In	Orange, TX	64,801	96	Industrial Organic Chemicals
9	James M Stuart Elec Generating Station	Aberdeen, OH	64,657	95	Electric Services
10	Detroit Edison Co	Monroe, MI	63,528	95	Electric Services
11	Illinois Power Co Baldwin Power Plant	Baldwin, IL	63,212	95	Electric Services
12	Alabama Power Co Ec Gaston	Wilsonville, AL	62,359	95	Electric Services
13	CP&L Roxboro	Raleigh, NC	57,649	95	Electric Services
14	Florida Power	Crystal River, FL	57,565	94	Electric Services
15	Kyger Creek Station Ohio Valley Elec Cor	Chesire, OH	55,772	95	Electric Services
16	Cardinal Operating Co	Brilliant, OH	49,377	95	Electric Services
17	TECO Big Bend Sta	Ruskin, FL	48,856	94	Electric Services
18	Duke Power Co Belews Creek Steam Statn	Walnut Cove, NC	47,821	95	Electric Services
19	Pa Elec Co	Homer City, PA	46,317	95	Electric Services
20	Ga Power Co Scherer Stm Elec Gen Sta	Juliette, GA	44,617	95	Electric Services
21	Ga Power Co Bowen Stm Elec Gen Sta	Taylorville, GA	42,568	95	Electric Services
22	PSI Energy Gibson	Princeton, IN	42,407	94	Electric Services
23	Ga Power Co Branch Stm Elec Gen Sta	Milledgeville, GA	40,422	95	Electric Services
24	TECO Gannon Sta	Tampa, FL	39,246	94	Electric Services
25	Com Ed Kincaid Generating Station	Kincaid, IL	38,968	95	Electric Services
26	Central Illinois Public Service	Coffeen, IL	38,920	95	Electric Services
27	Arizona Public Serv., 4 Corners	Fruitland, NM	37,917	91	Electric Services
28	Houston Lighting & Power Co	Fresno, TX	37,753	96	Electric Services
29	Appalachian Power Co John E Amos Plant	St. Albans, WV	36,673	95	Electric Services
30	Tva Environmental Affairs	McCracken County, KY	36,367	96	Electric Services
31	Tva Widows Creek Fossil Plant	Stevenson, AL	34,868	95	Electric Services
32	Monongahela Power Harrison	Haywood, WV	33,818	95	Electric Services
33	Salt River Project Navajo Station	Page, AZ	32,771	90	Electric Services
34	Duke Power Marshall Plt	Terrell, NC	32,756	95	Electric Services
35	Virginia Power Mount Storm	Mount Storm, WV	32,493	95	Electric Services
36	American Electric Power	Rockport, IN	31,873	94	Electric Services
37	American Electric Power	Lawrenceburg, IN	31,422	94	Electric Services
38	Detroit Edison Co	St Clair, MI	31,161	95	Electric Services
39	Ohio Power Kammer Plant	Moundsville, WV	31,112	95	Electric Services
40	Alabama Power Co Barry	Bucks, AL	30,696	95	Electric Services
41	TVA Kingston Steam Plant Kingston	Kingston, TN	30,583	96	Electric Services
42	Texas Utilities Electric Co	Tatum, TX	30,257	96	Electric Services
43	Kansas City Power & Light Co	Lacygne, KS	30,090	95	Electric Services
44	Phillip Sporn Plant	New Haven, WV	27,924	95	Electric Services
45	Alabama Power Gorgas	Parrish, AL	26,903	95	Electric Services
46	NipSCO Schahfer Station	Wheatfield, IN	26,865	94	Electric Services
47	Cooperative Power: Coal Creek	Underwood, ND	26,543	96	Electric Services
48	Pacificorp Jim Bridger	Point Of Rocks, WV	26,198	96	Electric Services
49	Sigeco Warrick Pwr Plant Alcoa Generatng	Newburgh, IN	26,022	94	Electric Services
50	Kentucky Utilities Co	Lexington, KY	25,895	96	Electric Services

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain database.

emissions exacerbate particulate levels.

In western states, local and regional industries can cause severe particulate problems unrelated to utilities. For example, in Salt Lake City, oil refineries are in large part respon-

sible for unhealthful levels of fine particulate aerosols that are often trapped in the atmospheric inversions that frequent the metro area at certain times of the year. In Los Angeles, diesel emissions and oil refineries are large sources of hazardous particulate levels in the region.

Table 8. Top particulate polluting facilities in the United States.

Name	Location	Particulate Emissions (PM10)	Year	Type of Industry
U S Steel Co Gary Works	Gary, IN	51,752	94	Steel Works
US Army National Training	Fort Irwin, CA	28,130	95	National Security
Columbia Gas Trans Corp	Standardsville, VA	25,575	94	Natural Gas Transmission
LTV Steel Mining Hoyt Lakes Taconite	Hoyt Lakes, MN	21,696	95	Iron Ores
Weirton Steel Corp	Weirton, WV	8,642	95*	Steel Works
Eveleth Mines Fairlane Plant	Forbes, MN	8,394	95	Iron Ores
Asarco Pima Mine	Sahuarita, AZ	5,920	92	Copper Ores
Amoco Oil Co Whiting Refinery	Whiting, IN	5,428	94	Petroleum Refining
USS MN Ore Operation	Mountain Iron, MN	5,288	95	Iron Ores
USX Corp Edgar Thomson Works	Braddock, PA	4,991	92	Steel Works
Pacificorp Jim Bridger	Point Of Rocks, WY	4,437	96	Electric Services
Texas Utilities Generating Co	Fairfield, TX	4,184	96	Electric Services
Texas Utilities Electric Co	Mt Pleasant, TX	4,056	96	Electric Services
Ga Power Co Branch Stm Elec Gen Sta	Milledgeville, GA	4,000	94*	Electric Services
Ga Power Co Scherer Stm Elec Gen Sta	Juliette, GA	4,000	94*	Electric Services
Ga Power Co Wansley Stm Elec Gen Sta	Roopville, GA	4,000	94*	Electric Services
Ga Power Co Bowen Stm Elec Gen Sta	Taylorville, GA	4,000	94*	Electric Services
Trade Waste Incinerator Inc	Sauget, IL	3,936	95	Refuse Systems
International Paper Co	Pine Bluff, AR	3,628	93*	Paper Mills
TVA Johnsonville Steam Plant	New Johnsonville, TN	3,533	96*	Electric Services
Ga Power Co Mcdonough	Smyrna, GA	3,454	94*	Electric Services
Inland Steel Mining	Virginia, MN	3,422	95	Iron Ores
Salt River Project Navajo Station	Page, AZ	3,387	90*	Electric Services
Peabody Coal Co Midwest Division	Baldwin, IL	3,371	95	Bituminous Coal - Underground Mining
Alabama Power Co Ec Gaston	Wilsonville, AL	3,359	95*	Electric Services
Northern States Power Sherburne Cnty	Becker, MN	3,319	95	Electric Services
Florida Power & Light	Parrish, FL	3,123	94	Electric Services
PP&L Montour SES	Derry Twp, PA	3,108	95	Electric Services
Alcoa Alumina & Chemicals L L C	Point Comfort, TX	3,103	96	Industrial Inorganic Chemicals
Ga Power Co Yates Stm Elec Gen Sta	Newnan, GA	3,079	94*	Electric Services
KPL Gas Service (jec)	St. Marys, KS	3,056	95	Electric Services
Ravenswood Aluminum Corp	Ravenswood, WV	3,020	95*	Primary Production Of Aluminum
Monongahela Power Harrison	Haywood, WV	3,018	95*	Electric Services
Pacific Power	Centralia, WA	2,789	94	Electric Services
MS Power Co Plant Jack Watson	Gulfport, MS	2,748	94*	Electric Services
Public Serv Co NM, San Juan Gen.	Waterflow, NM	2,704	95*	Electric Services
Great Southern Paper Woodlands Oper	Cedar Springs, GA	2,697	94*	Paperboard Mills
St Joe Forest Products Co	Port St Joe, FL	2,687	94	Paper Mills
Federal Paper Board Armour Plant	Riegelwood, NC	2,657	95*	Sawmills And Planing Mills
Black Butte Coal Co Black Butte Mine	Pt Of Rocks, WY	2,627	95	N/A
Ames Rubber Corp	Hamburg, NJ	2,608	96*	Fabricated Rubber Products
A E Staley Manufacturing Co	Decatur, IL	2,568	95	Wet Corn Milling
MN Power & Light Clay Boswell	Cohasset, MN	2,559	95	Electric Services
PP&L Brunner Island	York Haven, PA	2,491	95	Electric Services
MS Pwr Daniel	Moss Point, MS	2,405	93*	Electric Services
Peco Energy Eddystone	Eddystone, PA	2,398	95	Electric Services
Inland Rome Inc	Rome, GA	2,347	94*	Paperboard Mills
Cajun / Big Cajun 2	New Roads, LA	2,346	96	Electric Services
Acme Steel Co	Riverdale, IL	2,326	95	Steel Works
Cumberland Municipal Utility	Cumberland, WI	2,307	94	Electric And Other Services Combined

*Data for these facilities are in the form of Total Particulates since PM10 data were unavailable from EPA or the state agency. Source: Environmental Working Group. Compiled from U.S. EPA and state agency data.

Top Polluting Parent Companies

Sulfur Dioxide. Thirty-nine (39) of the top SO₂ polluting corporations are utilities (Table 9). Collectively, these conglomerates account for nearly two thirds (64.6 percent) of all SO₂

from stationary sources in the United States. Just 21 of these power companies account for more than one half of all stationary SO₂ emissions. The parent companies that are responsible for the most sulfur dioxide pollution in the country are the Ameri-

Chemical manufacturing, oil refining, pulp and paper milling, and metal smelting are significant local and regional sources of SO₂.

Pulp and paper, steel milling, chemical manufacturing, metal smelting and oil refining corporations all rank in the top 25 corporate particulate polluters.

can Electric Power Company with 1.24 million tons per year, the Southern Company with 932,000 tons per year, and the Tennessee Valley Authority with 835,000 tons per year. These three corporations alone account for nearly 20% of all SO₂ released by stationary sources (Table 9).

Chemical manufacturing, oil refining, pulp and paper milling, and metal smelting are significant local and regional sources of SO₂, although facility level sources of these emissions tend to be smaller and more widely distributed than the massive power plants that top the list.

Nitrogen Oxides. As with SO₂, the top polluting companies are virtually all power companies. Nine out of the top ten NOX polluting corporations are electric power conglomerates, the sole exception being DuPont Corporation at number 10 (Table 10). These ten corporations account for one quarter of the nations NOX pollution from stationary sources. The top three parent company NOX polluters are also the top three parent SO₂ polluters, the American Electric Power Company, with 492,000 tons, the TVA with 420,000 tons, and the Southern Company with 372,000 tons.

Fine Particles. Utilities do not dominate the top particulate polluters (Table 11).

Thirty-four (34) of the top 50 particulate polluting corporations are not utilities (Table 11). The

top particulate polluter is a major steel company, USX with 68,900 tons. Pulp and paper, steel milling, chemical manufacturing, metal smelting and oil refining corporations all rank in the top 25 corporate particulate polluters.

Congressional Districts

Sulfur Dioxide. Polluters in 32 congressional districts (8 percent of all districts) account for half of all SO₂ emissions from stationary sources. Fifty nine (59) districts, or 13 percent of all congressional districts, account for two-thirds of all sulfur dioxide pollution in the country. Twenty four (24) Democrats and 35 Republicans represent the 59 districts that account for two thirds of all industrial sulfur dioxide pollution.

Nitrogen Oxides. Pollution sources for nitrogen oxides are slightly less concentrated than sulfur dioxide. Polluters in 50 congressional districts (11 percent of all districts) account for half of all nitrogen oxide emissions from stationary sources. Twenty-two (22) of the top polluting districts are represented Democrats, 28 are represented by Republicans.

Fine Particles. Stationary particulate emissions sources are not totally dominated by large coal burning utilities located east of the Mississippi River. Polluters in 53 congressional districts, or 12 percent of all districts, spew 50 percent of direct par-

Table 9. Parent companies responsible for the most SO2 emissions.

Rank	Parent Company	Number of Facilities Reviewed	Total SO2 Emissions (Tons/yr)	Running % of Total
1	American Electric Power Co	19	1,240,032	7.99%
2	Southern Co Inc	29	932,989	14.00%
3	Tennessee Valley Authority	13	835,930	19.39%
4	Cinergy Corp	12	565,955	23.04%
5	GPU Inc	15	468,897	26.06%
6	Allegheny Power System Inc	10	339,190	28.25%
7	Illinova Corp	24	299,399	30.18%
8	DTE Energy Co	15	288,736	32.04%
9	PP & L Resources Inc	11	277,124	33.82%
10	Union Electric Co	5	261,217	35.51%
11	CipSCO Inc	5	257,251	37.17%
12	Texas Utilities Co	22	247,709	38.76%
13	Associated Electric Cooperative	3	239,054	40.30%
14	Dominion Resources Inc	13	234,865	41.82%
15	Centerior Energy Corp	6	224,645	43.26%
16	Unicom Corp	25	220,409	44.68%
17	TECO Energy Inc	3	207,937	46.02%
18	Duke Power Co	14	200,343	47.32%
19	Fpl Group Inc	12	182,791	48.49%
20	Pacificorp	13	171,085	49.60%
21	Sigcorp Inc	6	167,687	50.68%
22	Carolina Power & Light Co	10	164,022	51.73%
23	Ipalco Enterprises Inc	6	160,802	52.77%
24	Ohio Edison Co	6	159,726	53.80%
25	Potomac Electric Power Co	6	157,852	54.82%
26	DPL Inc	4	122,379	55.61%
27	Florida Progress Corp	13	117,233	56.36%
28	Scana Corp	12	115,946	57.11%
29	CMS Energy Corp	16	110,804	57.82%
30	Entergy Corp	21	107,796	58.52%
31	Niagara Mohawk Power Corp	5	106,612	59.20%
32	Central & South West Corp	18	103,407	59.87%
33	Ku Energy Corp	6	100,081	60.52%
34	Basin Electric Power Cooperative	4	94,407	61.12%
35	Houston Industries Inc	10	93,615	61.73%
36	Ohio Valley Electric Corp	1	92,806	62.33%
37	DuPont E I De Nemours & Co	151	89,001	62.90%
38	Salt River Project	3	88,586	63.47%
39	Electric Energy Inc	1	87,890	64.04%
40	Baltimore Gas & Electric Co	10	83,671	64.58%
41	Wisconsin Energy Corp	8	83,669	65.11%
42	American Municipal Power-Ohio	1	81,254	65.64%
43	Big Rivers Electric Corp	4	78,906	66.15%
44	New England Electric System	4	74,648	66.63%
45	Aluminum Co of America	23	73,641	67.10%
46	Wisconsin Power & Light Co	6	72,646	67.57%
47	Asarco Inc	18	72,376	68.04%
48	Northeast Utilities System	12	70,518	68.49%
49	USX Corp	29	70,461	68.95%
50	Public Service Co Of Colo	35	69,270	69.39%
	Total for Top 50 Corporations	718	10,767,267	
	Total Overall		15,516,477	

Source: Environmental Working Group. Compiled from EPA's AIRS and Acid Rain databases and state agency data.

Table 10. Parent companies responsible for the most NOx emissions.

Rank	Parent Company	Number of Facilities	Total NOx Emissions	Running % of all NOx Emissions
1	American Electric Power Co	19	492,051	5.41%
2	Tennessee Valley Authority	13	420,319	10.04%
3	Southern Co Inc	29	372,390	14.13%
4	DTE Energy Co	15	188,983	16.21%
5	Unicom Corp	25	182,178	18.21%
6	Entergy Corp	21	121,510	19.55%
7	Allegheny Power System Inc	10	120,959	20.88%
8	Texas Utilities Co	22	119,115	22.19%
9	Cinergy Corp	12	118,152	23.49%
10	E. I. DuPont De Nemours & Co	151	116,314	24.77%
11	Associated Electric Cooperative	3	115,957	26.05%
12	GPU Inc	15	114,306	27.30%
13	Pacificorp	13	113,296	28.55%
14	Carolina Power & Light Co	10	109,314	29.75%
15	Duke Power Co	14	103,733	30.89%
16	Williams Companies Inc	238	103,589	32.03%
17	TECO Energy Inc	3	88,564	33.01%
18	NIPSCO Industries Inc	6	84,280	33.93%
19	Illinova Corp	24	83,384	34.85%
20	Dominion Resources Inc	13	81,907	35.75%
21	Houston Industries Inc	10	81,780	36.65%
22	DPL Inc	4	76,404	37.49%
23	Northern States Power Co Minn	21	73,480	38.30%
24	Union Electric Co	5	66,383	39.03%
25	Florida Progress Corp	13	65,503	39.75%
26	Central & South West Corp	18	64,874	40.46%
27	Fpl Group Inc	12	62,867	41.15%
28	Kansas City Power & Light Co	4	60,832	41.82%
29	Ohio Edison Co	6	59,443	42.48%
30	Scana Corp	12	59,338	43.13%
31	Cipsco Inc	5	58,813	43.78%
32	Centerior Energy Corp	6	57,019	44.40%
33	Panenergy Corp	75	56,366	45.02%
34	Ohio Valley Electric Corp	1	55,772	45.64%
35	Potomac Electric Power Co	6	54,889	46.24%
36	Coastal Corp	112	54,529	46.84%
37	PP & L Resources Inc	11	54,516	47.44%
38	Basin Electric Power Cooperative	4	54,116	48.04%
39	CMS Energy Corp	16	53,982	48.63%
40	Public Service Co Of Colo	35	53,972	49.22%
41	Tenneco Inc	74	53,694	49.81%
42	Amoco Corp	155	53,388	50.40%
43	Exxon Corp	109	53,374	50.99%
44	Wisconsin Energy Corp	8	52,968	51.57%
45	Enron Corp	103	51,642	52.14%
46	Baltimore Gas & Electric Co	10	49,473	52.68%
47	Shell Oil Co	61	48,795	53.22%
48	Wisconsin Power & Light Co	6	48,196	53.75%
49	Pinnacle West Capital Corp	5	47,085	54.27%
50	USX Corp	29	45,810	54.77%
	Total for Top 50 Corporations	1,592	4,979,604	
	Total Overall		9,091,617	

Source: Environmental Working Group. Compiled from EPA's AIRS and Acid Rain databases and state agency data.

Table 11. Parent companies responsible for the most particulate emissions.

Rank	Parent Company	Number of Facilities Reviewed	Total Particulate Emissions in Tons	Running % of Total Particulate Emissions
1	USX Corp	29	68,973	5.37%
2	Southern Co Inc	29	39,533	8.45%
3	United States Government	143	32,810	11.00%
4	LTV Corp	13	27,308	13.13%
5	Columbia Gas System Inc	61	25,788	15.13%
6	International Paper Co	64	20,672	16.74%
7	Georgia Pacific Corp	83	18,547	18.19%
8	PacifiCorp	13	17,352	19.54%
9	FPL Group Inc	12	15,539	20.75%
10	Tennessee Valley Authority	13	12,689	21.74%
11	Texas Utilities Co	22	10,562	22.56%
12	Asarco Inc	18	10,560	23.38%
13	Weyerhaeuser Co	45	10,130	24.17%
14	Cargill Inc	196	10,102	24.95%
15	American Electric Power Co	19	8,647	25.63%
16	Weirton Steel Corp	1	8,642	26.30%
17	Eveleth Expansion Co	1	8,394	26.95%
18	Aluminum Co of America	23	7,444	27.53%
19	DuPont E I De Nemours & Co	151	7,360	28.11%
20	PP & L Resources Inc	11	7,013	28.65%
21	Amoco Corp	155	6,809	29.18%
22	Boise Cascade Corp	25	6,639	29.70%
23	Louisiana-Pacific Corp	44	6,594	30.21%
24	Duke Power Co	14	6,420	30.71%
25	Scana Corp	12	6,217	31.20%
26	Temple-Inland Inc	15	5,596	31.63%
27	Union Camp Corp	23	5,463	32.06%
28	Ekco Group Inc	23	5,418	32.48%
29	Tate & Lyle Inc	23	5,340	32.89%
30	Hanson Industries	46	5,167	33.30%
31	Inland Steel Industries Inc	3	5,164	33.70%
32	Allegheny Power System Inc	10	5,153	34.10%
33	Northern States Power Co Minn	21	5,140	34.50%
34	Champion International Corp	18	5,054	34.89%
35	Heidelberg Cement Inc	11	4,973	35.28%
36	GPU Inc	15	4,970	35.67%
37	Entergy Corp	21	4,666	36.03%
38	Potlatch Corp	13	4,651	36.39%
39	Reynolds Metals Co	38	4,381	36.73%
40	Centerior Energy Corp	6	4,339	37.07%
41	Owens Corning	34	4,316	37.41%
42	Willamette Industries Inc	33	4,311	37.74%
43	WMX Technologies Inc	15	4,260	38.07%
44	Holdernam Inc	14	4,183	38.40%
45	Teco Energy Inc	3	4,072	38.72%
46	Archer Daniels Midland Co	101	4,059	39.03%
47	Western Resources	12	4,024	39.35%
48	Jefferson Smurfit Corp	28	3,907	39.65%
49	Rhone Poulenc Rorer Inc	26	3,887	39.95%
50	General Motors Corp	44	3,812	40.25%
	Total for Top 50 Corporations	1,793	517,049	
	Total Overall		1,284,590	

For Archer Daniels Midland Co., average net income only includes 1995 figures.
 Source: Environmental Working Group. Compiled from U.S. EPA and state agency data.

For all forms of particulate pollution, the pattern is the same: members of congress representing big polluters are actively working against cleaner air.

particulate emissions into the air we breathe. Of these 53 districts, 17 are represented by Democrats and 33 are represented by Republicans.

Members On The Record Against Updated Health Standards

A number of letters have been sent by the Congress to President Clinton, urging him to weaken the current EPA proposal. We analyzed the pollution associated with districts represented by members who signed letters authored by Representatives John, Boucher, and LaHood. These three letters represent the first formal opposition to the EPA proposed rule. In total these three letters were signed by 130 members of Congress (83 Republicans and 47 Democrats). For all forms of particulate pollution, the pattern is the same: members of congress representing big polluters are actively working against cleaner air.

Thirty (30) percent of the House signed these three letters opposing updated health standards. Polluters in the districts represented by the signatories account for 56 percent of all SO₂ pollution, 51 percent of all NO_X pollution and 45 percent of all direct particulate pollution.

For SO₂, members representing 19 of the top 25 top polluting districts (Table 12) have signed at least one letter to President Clinton or EPA Administrator Carol Browner urging that EPA's delay or even scrap entirely the proposed health standards. For NO_X pollution, members representing 18 of the top 25 NO_X polluting districts have signed at least one such letter (Table 13), as have 16 of the 25 members representing districts with the largest particulate polluters (Table 14).

Table 12. Most of the members of Congress who represent the biggest SO2 polluters oppose the EPA proposal.

Rank	Congressperson	Opposes Updated Air Standards	SO2 Emissions (tons)	Running Percent
1	Lee Hamilton (D-IN)		488,661	3.1%
2	Alan Mollohan (D-WV)	✓	484,202	6.3%
3	John Hostettler (R-IN)	✓	459,417	9.2%
4	John Murtha (D-PA)	✓	379,009	11.7%
5	John Shimkus (R-IL)	✓	357,976	14.0%
6	Ted Strickland (D-OH)	✓	350,738	16.2%
7	Jerry Costello (D-IL)	✓	319,805	18.3%
8	Jo Ann Emerson (R-MO)	✓	285,523	20.1%
9	Edward Whitfield (R-KY)	✓	285,458	22.0%
10	Robert Ney (R-OH)	✓	271,685	23.7%
11	Bob Barr (R-GA)		251,011	25.4%
12	Max Sandlin (D-TX)	✓	215,377	26.7%
13	James Davis (D-FL)		210,245	28.1%
14	Earl Pomeroy (D-ND)		209,451	29.4%
15	Jim Bunning (R-KY)	✓	193,315	30.7%
16	Frank Mascara (D-PA)	✓	189,993	31.9%
17	John Dingell (D-MI)		188,991	33.1%
18	Spencer Bachus (R-AL)	✓	188,083	34.3%
19	Bart Gordon (D-TN)	✓	183,979	35.5%
20	Steven LaTourette (R-OH)	✓	180,308	36.7%
21	Bob Wise (D-WV)	✓	179,754	37.8%
22	Ron Klink (D-PA)	✓	179,072	39.0%
23	Zach Wamp (R-TN)	✓	176,119	40.1%
24	Richard Burr (R-NC)	✓	175,408	41.3%
26	Dan Burton (R-IN)		171,485	42.4%

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain Database.

Table 13. Most of the members of Congress who represent the biggest NOx polluters oppose the EPA proposal.

Rank	Congressperson	Opposes Updated Air Standards	NOx Emissions (tons)	Running Percent
1	Alan Mollohan (D-WV)	✓	190,654	2.1%
2	Edward Whitfield (R-KY)	✓	174,377	4.0%
3	John Tanner (D-TN)	✓	174,177	5.9%
4	Ted Strickland (D-OH)	✓	171,379	7.8%
5	Lee Hamilton (D-IN)		153,112	9.5%
6	Richard Burr (R-NC)	✓	133,009	11.0%
7	Barbara Cubin (R-WY)	✓	132,840	12.4%
8	Earl Pomeroy (D-ND)		115,982	13.7%
9	Bob Wise (D-WV)	✓	114,903	15.0%
10	W. (Billy) Tauzin (R-LA)	✓	111,095	16.2%
11	Ray LaHood (R-IL)	✓	110,861	17.4%
12	John Dingell (D-MI)		110,627	18.6%
13	John Murtha (D-PA)	✓	108,850	19.8%
14	David Bonior (D-MI)		108,159	21.0%
15	Rob Portman (R-OH)		106,914	22.2%
16	Jo Ann Emerson (R-MO)	✓	104,124	23.3%
17	John Shimkus (R-IL)	✓	103,480	24.5%
18	Robert Ney (R-OH)	✓	102,687	25.6%
19	Jim Turner (D-TX)	✓	102,661	26.7%
20	John Hostettler (R-IN)	✓	100,783	27.8%
21	Bill Redmond (R-NM)		99,675	28.9%
22	Christopher John (D-LA)	✓	99,236	30.0%
23	Jerry Costello (D-IL)	✓	96,374	31.1%
24	Jim Bunning (R-KY)	✓	93,965	32.1%
25	James Davis (D-FL)		91,007	33.1%
	U.S. Total		9,091,617	

Source: Environmental Working Group. Compiled from U.S. EPA, state agency data, and U.S. EPA Acid Rain database.

Table 14. Most of the members of Congress who represent the biggest particulate polluters oppose the EPA proposal.

Rank	Congressperson	Opposes Updated Air Standards	Particulate Matter Emissions (tons)	Running Percent
1	Peter Visclosky (D-IN)		62,673	4.9%
2	James Oberstar (D-MN)		55,446	9.2%
3	Barbara Cubin (R-WY)	✓	34,138	11.9%
4	Jerry Lewis (R-CA)		31,817	14.3%
5	Thomas Bliley (R-VA)		27,203	16.4%
6	Jay Dickey (R-AR)	✓	20,853	18.1%
7	Alan Mollohan (D-WV)	✓	18,186	19.5%
8	Jerry Costello (D-IL)	✓	16,689	20.8%
9	Jerry Moran (R-KS)	✓	14,527	21.9%
10	Bob Barr (R-GA)		13,193	22.9%
11	John Linder (R-GA)	✓	12,906	23.9%
12	Bill Barrett (R-NE)		12,411	24.9%
13	Christopher Cannon (R-UT)	✓	12,116	25.9%
14	Jo Ann Emerson (R-MO)	✓	11,202	26.7%
15	Rick Hill (R-MT)	✓	10,891	27.6%
16	Sonny Callahan (R-AL)	✓	10,339	28.4%
17	Jack Kingston (R-GA)	✓	10,100	29.2%
18	Scott McInnis (R-CO)	✓	9,770	29.9%
19	Michael Crapo (R-ID)		9,764	30.7%
20	Christopher John (D-LA)	✓	8,746	31.4%
21	Jesse Jackson (D-IL)		8,719	32.0%
22	John Tanner (D-TN)	✓	8,690	32.7%
23	Jim Ryun (R-KS)		8,450	33.4%
24	J. Hayworth (R-AZ)	✓	8,309	34.0%
25	John Shimkus (R-IL)	✓	8,234	34.7%
	U.S. Total		1,284,590	

Source: Environmental Working Group. Compiled from U.S. EPA and state agency data.

Dollars and Sensibilities

Despite industry rhetoric to the contrary, the proposed air quality standards in and of themselves, impose no regulatory burden or cost on any industry. Instead, the standards define a level of air quality that in EPA's view meets the health requirements of the Clean Air Act. They are the benchmark standard of clean air. Indeed, the proposed standard reflects the near scientific consensus that the current PM 10 standard does not represent clean air, and does not meet the requirements of the law.

Updated health standards add teeth to ongoing regulatory initiatives, and help ensure that gains promised from certain pollution control technologies and strategies, actually materialize. If pollution is not reduced to these levels by a specified date, municipalities are required to develop plans for achievement of these new clean air goals. The rules, however, do not require any specific pollution source to bear the burden of attaining the goal. That is both the beauty and the Achilles' heel of the Clean Air Act. It does not dictate a specific fix to any air quality problem, rather, it allows

communities to weigh the costs and benefits, and tailor the best plan to achieve clean air in their area.

The Dollar Value of the Health Benefits Far Exceeds Pollution Control Costs

In contrast to setting a public health goal, implementation of the standard involves a consideration of costs and benefits. To ensure that compliance is feasible, the EPA has estimated the costs of attainment in advance. The agency analysis came to several important conclusions:

- The benefits outweigh the costs enormously. In fact, the public health benefits of the proposed standard are at least ten times greater than the costs — \$65 billion to \$140 billion per year in benefits compared to \$ 6.3 billion per year in pollution control costs (EPA 1996f).
- The benefits outweigh the costs even though EPA excluded the economic value of many of the benefits that the standards will provide, including reduced lung and bronchial cancer incidence

Updated health standards add teeth to ongoing regulatory initiatives, and help ensure that gains promised from certain pollution control technologies and strategies, actually materialize.

Industry predicted the costs of acid rain reduction at \$1,000 to \$1,500 per ton in 1990, compared to the \$67 to \$100 that they currently pay for a one ton allowance.

and improved visibility in National Parks.

- The more protective the standard, the greater the economic benefits. Small increments of pollution reduction generate huge economic benefits in reduced health care costs.

costs of compliance (Browner 1997). Indeed, compliance costs will pale in comparison to the value of the health benefits provided by the standard if the loopholes in the EPA proposal are closed.

The Real Cost of Pollution Control

In an era of surging corporate profits and bloated executive compensation packages, the costs of controlling air pollution are barely a blip on the corporate financial radar screen, though you would never know it from the rhetoric industry is using to fight EPA's proposed particulate pollution rule.

EPA estimates the costs of achieving the new health standards at \$6.3 billion dollars per year over the next ten years. Notwithstanding the fact that EPA has overestimated the actual costs of achieving every major air pollution regulation ever implemented, we used the agency's \$6.3 billion cost estimate as a benchmark for understanding the relative impact that the particulate pollution rule will have on the economy. EPA's cost overestimates are not a fluke or the result of bad calculations. In fact, EPA's cost estimates tend to overstate the costs to purchase and maintain pollution control equipment and overlook the value of tax deductions associated with capital investments such as equipment (EPA 1996f).

Industry and EPA Historically Overestimate the Costs of Pollution Control

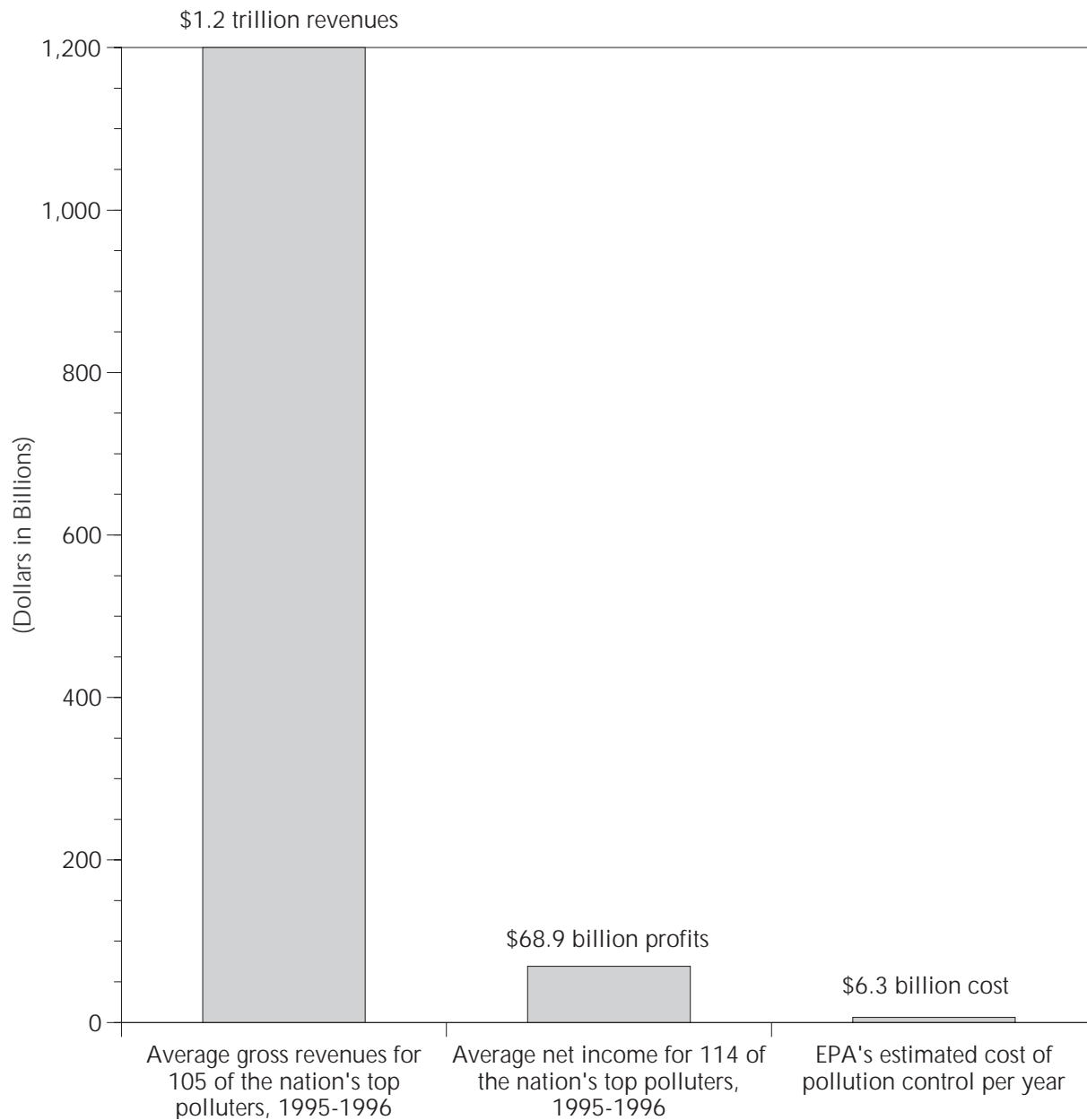
Experience shows that compliance costs for the particulate rule will be even less than the EPA predicts. Historically the EPA has understated the benefits and overestimated the costs of complying with most air pollution standards. For example, in 1990, the EPA estimated the costs of an allowance to emit a ton of sulfur dioxide at \$400 to \$800. The actual costs run less than \$100.

Industry cost estimates have been even more wildly off the mark. Industry predicted the costs of acid rain reduction at \$1,000 to \$1,500 per ton in 1990, compared to the \$67 to \$100 that they currently pay for a one ton allowance. And in 1994, the auto industry estimated per vehicle costs for the low emissions car at \$1,500 per car. Current California data show the actual costs to be about \$60 to \$100 per car.

On average, industry has overestimated the costs of pollution control by a factor of 14 in the last two major air quality rulemakings, based on actual

In an era of surging corporate profits and bloated executive compensation packages, the costs of controlling air pollution are barely a blip on the corporate financial radar screen.

Figure 2. The cost of clean air is a tiny fraction of the annual revenues and profits of America's major polluters.



Source: Environmental Working Group. Compiled from Securities and Exchange Commission, EDGAR database (<http://www.sec.gov>). The 1995 and 1996 annual gross revenue and net income data were compiled by EWG from "Form 10-K", electronically filed annual reports to the SEC, submitted through the first quarter of 1997. Data were supplemented with annual reports for some companies.

Cost to Sales Ratios

EPA analyzes the economic impact of pollution control by comparing the costs of control to average sales revenue, by industry. EPA has in fact conducted

such an analysis and identified 51 industries as *potentially* significantly affected by the proposed particulate rule due to a cost to sales ratio of greater than 3 percent. Many of these potentially affected industries, however, are

Table 15. Annual net income and gross revenue of major polluters.

Name	Number of Facilities	Average Annual Net Income 1995-96	Average Annual Gross Revenue 1995-96
Acme Metals Inc	6	\$15,456,500	\$509,930,500
Allegheny Power System Inc	10	\$224,869,500	\$2,321,424,500
Aluminum Co of America	23	\$445,050,000	\$12,891,650,000
American Electric Power Co	19	\$558,666,500	\$5,759,782,000
Amoco Corp	155	\$2,348,000,000	\$33,558,000,000
Archer Daniels Midland Co	101	\$347,956,000	N/A
Asarco Inc	18	\$153,744,500	\$2,947,223,500
Atlantic Richfield Co	22	\$1,519,500,000	N/A
Baltimore Gas & Electric Co	10	\$324,415,500	\$3,044,023,000
Bethlehem Steel Corp	5	(\$85,550,000)	\$4,773,250,000
Boise Cascade Corp	25	\$180,455,000	\$5,090,205,000
Burlington Resources Inc	83	(\$12,322,500)	\$1,083,000,000
Carolina Power & Light Co	10	\$381,940,500	\$3,001,134,000
Centerior Energy Corp	6	\$170,532,500	\$2,534,624,500
Central & South West Corp	18	\$434,000,000	\$4,149,000,000
Central Louisiana Electric Co	4	\$50,419,000	\$414,921,000
Champion International Corp	18	\$456,570,500	\$6,426,240,500
Chevron Corp	29	\$1,768,500,000	\$40,487,500,000
Cilcorp Inc	5	\$43,763,000	\$498,149,500
Cinergy Corp	12	\$368,006,000	\$3,132,870,000
Cipsco Inc	5	\$77,204,500	\$869,488,500
Citizens Utilities Co	2	\$169,098,000	N/A
Clark Refining & Marketing Inc	3	(\$32,035,500)	\$4,779,400,500
CMS Energy Corp	16	\$222,000,000	\$4,111,500,000
Coastal Corp	112	\$336,500,000	\$11,312,250,000
Columbia Gas System Inc	61	(\$69,550,000)	\$2,994,600,000
Delmarva Power & Light Co	4	\$58,744,000	N/A
Dominion Resources Inc	13	\$448,500,000	\$4,747,000,000
Dow Chemical Co The	7	\$1,985,500,000	\$20,126,500,000
DPL Inc	4	\$169,700,000	N/A
DQE Inc	4	\$174,850,500	\$1,222,678,500
DTE Energy Co	15	\$357,605,000	\$3,638,793,500
Duke Power Co	14	\$722,252,000	\$4,717,329,000
DuPont E I De Nemours & Co	151	\$3,464,500,000	\$44,186,000,000
Eastman Chemical Co	15	\$469,500,000	\$4,911,000,000
Eastman Kodak Co	3	\$1,270,000,000	\$15,756,500,000
Ekco Group Inc	23	(\$13,064,500)	\$248,437,000
Engelhard Corp	10	\$143,984,000	\$3,012,265,500
Enron Corp	103	\$552,000,000	\$11,239,000,000
Entergy Corp	21	\$470,003,500	\$6,725,366,000
Exxon Corp	109	\$6,990,000,000	\$129,084,500,000
Florida East Coast Industries	1	\$28,525,500	\$213,807,000
Florida Progress Corp	13	\$244,000,000	\$2,332,650,000
FMC Corp	18	\$213,150,000	\$4,794,150,000
Ford Motor Co	42	\$4,292,500,000	\$142,064,000,000
FPL Group Inc	12	\$584,102,500	\$5,758,242,500
General Motors Corp	44	\$5,922,000,000	\$162,170,500,000
Georgia Pacific Corp	83	\$587,000,000	\$13,668,500,000
GPU Inc	15	\$369,243,500	\$3,861,372,500
Hoechst Celanese Corp	14	\$230,000,000	\$7,150,500,000
Hoosier Energy Rural Electric Cooperative	2	\$13,836,500	\$255,528,500
Houston Industries Inc	10	\$455,175,000	\$3,852,662,000
Illinova Corp	24	\$171,311,000	\$1,665,050,000
IMC Global Inc	16	\$72,150,000	N/A
Inland Steel Industries Inc	3	\$96,250,000	\$4,682,800,000
International Paper Co	64	\$728,000,000	\$19,970,000,000
Ipalco Enterprises Inc	6	\$106,526,500	\$735,854,500
ITT Industries Inc	7	\$465,300,000	\$8,801,150,000
Jefferson Smurfit Corp	28	\$177,500,000	\$3,751,500,000
Kansas City Power & Light Co	4	\$115,378,500	\$894,937,000
Ku Energy Corp	6	\$79,001,000	\$699,070,500
Lafarge Corp	29	\$135,239,500	\$1,560,719,500
Louisiana-Pacific Corp	44	(\$126,200,000)	\$2,664,500,000
Lower Colorado River Authority	3	\$30,049,000	\$417,893,000
LTV Corp	13	\$147,000,000	\$4,209,000,000
Mead Corp	13	\$272,650,000	\$4,942,950,000
Medusa Corp	14	\$47,851,000	\$308,352,000
Minnesota Mining & Manufacturing Co	44	\$1,424,000,000	\$13,848,000,000
Minnesota Power & Light Co	3	\$66,963,000	\$759,922,500
Minnkota Power Cooperative	2	\$1,488,647	\$115,799,918
Missouri Public Service	1	\$93,000,000	\$3,565,250,000
Mobil Corp	99	\$2,670,000,000	\$78,436,500,000
Monsanto Co	26	\$562,000,000	\$9,112,000,000
Montana Power Co Inc	4	\$88,161,500	\$963,216,000
New England Electric System	4	\$207,000,000	\$2,311,500,000
New York State Etc & Gas Corp	7	\$187,465,500	\$2,034,456,000
Niagara Mohawk Power Corp	5	\$179,213,000	\$3,953,995,500
NIPSCO Industries Inc	6	\$176,099,500	\$1,771,975,500
NKK USA Corp	4	\$77,676,500	\$2,954,125,500

relatively minor polluters, who in all likelihood will not need to be regulated to achieve the new particulate standard. In fact, most industries did not exceed EPA's three percent threshold.

A more accurate indicator of the true costs of achieving the particulate standard is the cost to sales ratios for *major* polluters. Based on records from the Securities and Exchange Commissions (SEC) and annual reports for some electric cooperatives, the Environmental Working Group analyzed the gross revenues and net income of the 125 of the top 171 parent companies that own the top 100 polluting facilities in each of the three categories analyzed (SO₂, NO_x, and PM 10). (Table 15).

We found that the combined gross revenues for 105 of the top polluters analyzed in this report averaged \$1.2 *trillion* dollars per year over the past 2 years, 200 times the estimated costs of achieving the proposed particulate standard. This represents a costs to sales ratio of 0.5 percent (Figure 2).

Utilities, by far the largest source of all particulate related pollution, generate enormous revenues each year. The top 83 polluting utilities reported average annual gross revenues of \$165 billion in 1995-96. Assuming that these utilities pay *all* the costs of achieving the entire rule, the costs to sales ratio for achieving the rule would be 3.8 percent. Of course, these 83

utilities will not have to pay the entire costs of achieving the rule.

Gross revenues of the oil industry, another major particle polluter, averaged \$458 billion for 1995-1996. Assuming the oil industry pays the entire cost of achieving the rule, the cost to sales ratio for achieving the rule would be 1.3 percent.

Costs vs. Profits

Another way to look at pollution control expenses is to compare the cost of control with the profits (net income) of polluting corporations. Comparing costs to profits, however, artificially inflates the size of the costs in comparison to the actual funds and financial mechanisms (better represented by revenues) available to reduce the impact of pollution control expenses. EPA does not use costs to profits ratios in analyzing the economic impact of environmental regulations because it is somewhat akin to comparing apples and oranges. The costs of pollution control are better viewed as one additional cost that will be accrued against the revenue stream of the company, and will be depreciated, deducted, and otherwise deferred in the most advantageous possible way for the company.

The average net income for fiscal years 1995-1996 for 114 of the top 171 polluters was \$68.6 billion, more than 11 times the estimated costs of implementing the new particulate standard.

Table 15, continued.

Name	Number of Facilities	Average Annual Net Income 1995-96	Average Annual Gross Revenue 1995-96
NL Industries Inc	9	\$48,213,000	\$1,005,006,500
Northeast Utilities System	12	\$142,132,500	\$3,771,354,000
Northern States Power Co Minn	21	\$275,167,000	\$2,611,395,000
Ohio Edison Co	6	\$316,205,500	\$2,467,815,500
Oklahoma Gas & Electric Co	5	\$129,294,000	\$1,184,312,000
Otter Tail Power Co	2	\$29,450,000	\$344,034,000
Owens Corning	34	(\$26,500,000)	\$3,722,000,000
Pacific Gas & Electric Co	27	\$1,047,047,000	\$9,615,868,500
Pacificorp	13	\$504,950,000	\$2,788,450,000
Panenergy Corp	75	\$324,000,000	\$6,252,150,000
Peco Energy Co	10	\$563,500,000	N/A
Phelps Dodge Corp	12	\$604,200,000	\$3,986,000,000
Phillips Petroleum Co	63	\$886,000,000	\$14,664,000,000
Pinnacle West Capital Corp	5	\$241,520,500	\$1,666,612,000
Potlatch Corp	13	\$83,317,500	\$1,579,827,500
Potomac Electric Power Co	6	\$165,675,500	\$1,943,206,500
PP & L Resources Inc	11	\$354,542,000	\$2,831,000,000
PPG Industries Inc	13	\$756,000,000	\$7,137,850,000
Public Service Co Of Colo	35	\$184,601,000	\$2,140,993,500
Public Service Co Of New Mexico	4	\$74,071,000	\$845,925,500
Public Service Enterprise Group Inc	12	\$598,697,000	\$5,766,300,500
Reynolds Metals Co	38	\$239,000,000	\$7,134,000,000
Rhone Poulenc Rorer Inc	26	\$415,000,000	N/A
Rochester Gas & Electric Corp	2	\$84,719,500	\$1,035,187,500
Salt River Project	3	\$97,222,500	\$1,361,452,000
Scana Corp	12	\$197,372,500	\$1,432,901,000
Seminole Electric Cooperative	1	\$4,400,500	\$544,843,500
Shell Oil Co	61	\$1,770,500,000	\$26,900,500,000
Sierra Pacific Resources	3	\$70,170,500	\$616,916,500
Sigcorp Inc	6	\$44,041,500	\$355,714,000
Southdown Inc	12	\$53,600,000	\$630,100,000
Southern California Edison	12	\$392,997,500	N/A
Southern Co Inc	29	\$608,000,000	\$9,790,000,000
Southwestern Public Service Co	7	\$112,625,000	\$866,740,000
Stone Container Corp	21	\$64,650,000	\$6,246,500,000
Sun Co Inc	20	\$12,500,000	\$10,588,500,000
Teco Energy Inc	3	\$196,097,500	\$1,432,650,000
Temple-Inland Inc	15	\$207,150,000	\$3,477,950,000
Tenneco Inc	74	\$572,500,000	\$5,954,000,000
Tennessee Valley Authority	13	\$35,500,000	\$5,534,000,000
Texaco Inc	126	\$1,312,500,000	\$41,143,500,000
Texas Utilities Co	22	\$657,663,000	\$5,795,036,500
Unicom Corp	25	\$653,000,000	\$6,923,534,500
Union Camp Corp	23	\$268,190,500	\$4,112,453,000
Union Carbide Corp	13	\$754,000,000	\$5,997,000,000
Union Electric Co	5	\$309,491,500	\$2,251,364,000
Unocal Corp	51	\$148,000,000	N/A
USG Corp	31	(\$8,500,000)	\$2,517,000,000
USX Corp	29	\$578,500,000	\$22,404,000,000
Weirton Steel Corp	1	\$49,150,000	\$1,367,506,000
Western Resources	12	\$175,313,000	\$1,895,059,500
Weyerhaeuser Co	45	\$631,000,000	\$11,451,000,000
Willamette Industries Inc	33	\$353,445,000	\$3,649,374,000
Williams Companies Inc	238	\$840,258,000	\$3,193,443,000
Wisconsin Energy Corp	8	\$225,991,500	\$1,772,152,000
WMX Technologies Inc	15	\$397,992,000	\$9,119,994,000
	3,430	\$68,677,996,147	\$1,211,376,438,418

Numbers in parentheses reflect negative net income.

These companies ranked in the top 100 in the United States for one or more of the three pollutants (SO₂, NO_x, particulates) studied. Only companies for which income data were available are included in Table 15.

Source: Compiled by Environmental Working Group from Securities and Exchange Commission, EDGAR database (<http://www.sec.gov>). The 1995 and 1996 annual gross revenue and net income data were compiled by EWG from "Form 10-K", electronically filed annual reports to the SEC, submitted through the first quarter of 1997. Data were supplemented with annual reports for some companies.

Average net income for 83 of the top utilities for 1995-1996 was \$18.4 billion, about three times the entire costs of the proposed rule. The bottom line: these 83 utilities alone have nearly three times the available *cash on hand* at the end of each year to pay the entire cost of

meeting the new health standard for fine particles. Again, these 83 utilities will not have to pay the entire costs of achieving the rule, and whatever costs they might incur would be balanced against their entire revenue stream, not against end of the year profits.

Conclusions

Particulate pollution causes the premature death of at least 35,000 people each year. Fine particles, less than 2.5 ug in diameter, are the most deadly form of this pollution. The vast majority of fine particle pollution comes from electric power companies and industrial sources (oil refineries, pulp mills, steel mills, and chemicals plants) as opposed to cars, trucks, and other personal activities. Controlling this pollution and saving these lives is relatively inexpensive (\$6.3 billion per year) relative to the high profitability (approximately \$68.6 billion per year for 1995-1996) and enormous annual revenue (\$1.2 *trillion*) of just 105 of the major polluting corporations.

Nonetheless, polluters are fighting any update of current, decade-old health standards. To this end, a series of industry front groups, lead by Citizens for a Sound Economy, are waging a multi-million dollar PR campaign designed to convince the Congress that revising these outdated health standards is unnecessary and too expensive.

With some members of Congress, industry efforts are suc-

ceeding. More than one hundred members of the House of Representatives have signed one of the three key letters authored by Reps. John Boucher, and LaHood urging the President and EPA Administrator Browner to delay or weaken any update of current health standard. Most of these members represent major polluting corporations. In the House, members from 19 of the top 25 SO₂ polluting districts, 18 of the top 25 NO_x polluting districts, and 16 of the top 25 particulate polluting districts, have signed these letters to President Clinton urging him to delay or scrap the proposed standard.

Recommendations

On March 20, 1997, 1,375 medical professionals registered their support for the EPA proposal in a letter to President Clinton. According to these medical experts tens of thousands of premature deaths and hospitalizations could be prevented each year by implementing more stringent air quality standards. Indeed, these medical authorities emphasized to the President that even under the EPA proposal "millions of people could still be exposed to harmful

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levels of particulate pollution". The letter then urges the President "to direct EPA to adopt air pollution standards *that are at least as protective* as those proposed, [emphasis added].

President Clinton and EPA Administrator Browner should listen to the public health community and medical experts, not the polluters or their so-called independent experts. Congress, in turn, must not cave to corporate cash or public relations campaigns.

More Protective Health Standards

The Clinton Administration's proposed PM 2.5 standard for fine particles represents a significant improvement in the status quo. But in order to fully protect the public health, and particularly the health of the most vulnerable individuals in the population, it must be strengthened. We recommend an annual average PM 2.5 standard of 10ug/m³, and a 24 hour PM_{2.5} standard of 20ug/m³.

Close Monitoring Loopholes

The agency's proposed multi-monitor averaging scheme for compliance with the annual standard, and its proposal to enforce the daily standard at the 98th percentile of high pollution days, undermine the clear potential public health benefits of the proposed standard. We recommend, instead, that the agency retain current monitoring and enforcement procedures. At the same time, we support the agency's desire to expand and update the ambient air monitoring network. Additional monitoring must not be used, however, to gloss over areas of persistent high pollution.

Right to Know

The public has a fundamental right to know about pollution in the air they breathe. We recommend, therefore, that the EPA improve its management of emissions data, and that the agency make available on the world wide web, data on both emissions and air pollution levels for the entire United States, in a manner consistent with data already available in the Toxics Release Inventory.

Members

National Association of Manufacturers Air Quality Standards Coalition

(Membership list as of October 1996)

3M	American Farm Bureau Federation
A. Finkl & Sons Co.	American Feed Industry Association
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Alabama Coal Association	American Meat Treating, Inc.
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Westvaco Corporation
Wheeling Pittsburgh
Wilmer, Cutler & Pickering
WMX Technologies, Inc.
Wright & McGill Company
Xerox Corp.
York Container Company

References

- Aerometric Information Retrieval System (AIRS). 1997. Database provided by the United States Environmental Protection Agency.
- Bascom, R., P.A. Bromberg, D.A. Costa, R. Devlin, D.W. Dockery, M.W. Frampton, W. Lambert, J.M. Samet, F.E. Speizer, and M. Utell. 1996. Health Effects of Outdoor Air Pollution. *Am. J. Respir. Crit. Care Med.* 153:3-50.
- Browner, C. M. 1997. Oral Testimony of Carol M. Browner, Administrator, U.S. Environmental Protection Agency, before the Senate Committee on Environment and Public Works. February 12, 1997.
- California Air Resources Board. 1997. Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant. Draft Report. Public Comment and SRP Version. May 9, 1997.
- Dockery and Pope. 1994. Acute Respiratory Effects of Particulate Air Pollution. *Annu. Rev. Public Health.* 15:107-32.
- Environmental Working Group. 1997. Particulate Air Pollution Report Series: Human Mortality, Pollution Sources and the Case for Tougher Clean Air Standards. Environmental Working Group, Washington, DC.
- Hebert, H. Josef. 1997. EPA's Browner Defends Proposal. Associated Press. March 10, 1997.
- Natural Resources Defense Council. 1996. Breath-Taking: Premature Mortality due to Particulate Air Pollution in 239 American Cities. 154 pp. May, 1996.
- Ostro, B. 1993. The Association of Air Pollution and Mortality: Examining the Case for Inference. *Archives of Environmental Health.* Vol.48 No.5 336-342.
- Pope, C.A, M.J. Thun, M.M. Namboodiri, D.W. Dockery, J.S. Evans, F.E. Speizer, C.W. Heath, Jr. 1995. Particulate Air Pollution as a Pre-

dictor of Mortality in a Prospective Study of U.S. Adults. *Am. J. Resp. Crit. Care Med.* 151:669-74.

Securities and Exchange Commission. 1997. Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) database. Form 10-K Reports through first quarter, 1997.

Schwartz, J. 1994. Air Pollution and Daily Mortality: A review and Meta Analysis. *Environmental Research.* 64:36-52.

U.S. E.P.A. 1993. Memorandum. Priority Revision of the PM₁₀ NAAQS. From David Gardiner, Gary Foley, and Michael Shapiro to the Administrator. July 19, 1993. As cited in NRDC, 1996.

U.S. E.P.A. 1996a. Air Quality Criteria for Particulate Matter.

U.S. E.P.A. 1996b. National Ambient Air Quality Standards for Particulate Matter: Proposed Decision. 40 CFR Part 50.

U.S. E.P.A. 1996c. Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information. November, 1995.

U.S. E.P.A. 1996d. EPA Proposes Air Standards for Particulate Matter and Ozone. *Environmental News.* EPA Office of Communications, Education and Public Affairs. November, 27, 1996.

U.S. E.P.A. 1996e. National Air Pollutant Emissions Trends Report, 1990-1995. United States Environmental Protection Agency. EPA-454/R-96-007. October, 1996.

U.S. E.P.A. 1996f. Regulatory Impact Analysis for Proposed Particulate Matter National Ambient Air Quality Standard. Draft Document. Prepared by Innovative Strategies and Economics Group, Office of Air Quality Planning and Standards. Research Triangle Park, N.C. December 1996.

U.S. E.P.A. 1997. Statement by Mary Nichols, EPA Assistant Administrator, Office of Air and Radiation. April 2, 1997.