

## Interesting facts about coal-fired power plants, mercury, and other pollutants:

1. Coal is the number one source of total US electricity production (54%).  
(*Energy Information Administration, Annual Energy Outlook, 1998*).
2. Out of the entire US electric industry, coal-fired power plants contribute 96% of sulfur dioxide emissions (SO<sub>2</sub>), 93% of nitrogen oxide emissions (NO<sub>x</sub>), 88% of carbon dioxide emissions (CO<sub>2</sub>) and 99% of mercury emissions.  
(*Clean the Air, "Power Plant Air Pollution Problem," Fact sheet*).
3. Coal-fired power plants are the single largest source of mercury pollution in the US (U.S. EPA, Office of Water, "Air Pollution and Water Quality: Atmospheric Deposition Initiative: Where is the Air Pollution Coming From?") Available online at <http://www.epa.gov/owow/wtr1/oceans/airdep/air5html>., responsible for 33% of the total mercury emissions from all known manmade sources nationwide.  
(U.S. EPA, *Mercury Report to Congress, 1997, Vol. 1*).
4. According to the US National Wildlife Federation (NWF), a single 100 megawatt (MW) coal-fired power plant emits approximately 25 pounds of mercury a year.  
(*National Wildlife Federation, "Clean the Rain, Clean the Lakes: Mercury in Rain is Polluting the Great Lakes," p. 4, September 1999*).
5. According to the US Center for Clean Air Policy, 50% of the mercury emitted from coal-fired power plants can travel up to 600 miles from the power plant.  
(*Center for Clean Air Policy, "Power Plant Emissions and Water Quality," October 1997, Part 1, p.13*).
6. In 1994, mercury emissions by coal plants in the US reached 51 tons.  
(U.S. EPA, "Electric Utility Steam Generating Units Hazardous Air Pollutant Emission Study," (Feb. 24, 1998), p.ES-6, Table ES-2).
7. According to NWF, as little as 0.002 pounds of mercury a year can contaminate a 25-acre lake to the point where fish are unsafe to eat.  
(*National Wildlife Federation, "Clean the Rain, Clean the Lakes: Mercury in Rain is Polluting the Great Lakes," p. 4, September 1999*).
8. Methylmercury contamination in food sources as low as one part per million has been shown to cause death in some animals.  
(*Factsheet, Great Waters Program, National Wildlife Federation*).
9. Coal emits 29% more carbon per unit of energy than oil, and 80% more than natural gas. (*Worldwatch Institute, "Phasing out Coal: Environmental Concerns, Subsidy Cuts Fuel Decline," Press Release*). CO<sub>2</sub> represents the major portion of greenhouse gases. Over the last 30 years, the concentration of

greenhouse gases in the atmosphere has increased by 30%, (i.e. the human-influenced phenomenon called global warming). Nine of the ten warmest years in recorded history have occurred in the last decade. (*Physicians for Social Responsibility, "Death by Degrees: The Emerging Health Crisis of Climate Change in Georgia," February 2000, p.6.1*)

10. In 1997, pollution controls from power plants to reduce acid rain cost approximately \$100 per ton.  
(*"Heavy Breathing," National Journal, January 4, 1997*)
11. Every year, nearly 600 coal and oil-fired power plants produce over 100 million tons of sludge waste. (*Citizens Coal Council, Hoosier Environmental Council, Clean Air Task Force, "Laid to Waste: The Dirty Secret of Combustion Waste from America's Power Plants," February 2000, p. 1.3*) Forty percent of the coals waste landfills and 80 percent of the coal waste surface impoundments do not have liners, and less than half the landfills and only 1 percent of impoundments have groundwater monitors.  
(*"Fast Facts on Air," A Sourcebook for the Clean Air Advocate, Clean Air Network, 2000*)

## Health Impacts From Air Pollution From Power Plants

### Fine Particles and Coal-fired power plants

- **"Fine particles"** are a mixture of a variety of different compounds and pollutants that originate primarily from combustion sources such as coal-fired power plants. Fine particles are of gravest concern because they are so tiny that they can be inhaled deeply, thus evading the human lungs' natural defenses.  
(Spengler, "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants" , Harvard School of Public Health, September 2000).
- Most of the coal used in the United States today is burned by aging power plants for the production of electricity. Coal-burning power plants outstrip all other polluters as the largest source of sulfate air pollution in the U.S.  
(U.S. EPA, OAR "Air Quality Criteria for Particulate Matter" 1995)
- Coal-burning power plants account for nearly 90 percent of the SO<sub>2</sub> emitted by all power plants.  
(U.S. EPA, Acid Rain Program, "National Summary Percent Contribution by Unit Fuel Type.")
- In 1998, power plants were responsible for 67 per cent-a full two thirds- of the annual total sulfur dioxide (SO<sub>2</sub>) and over a quarter of the nitrogen oxides (NO<sub>x</sub>) emitted in the U.S.  
(U.S. EPA, "National Air Quality and Emission Trends Report, 1998", p.125, March 2000)
- Power plants also emit fine carbon soot particles directly from their smokestacks. In 1999, coal plants directly emitted nearly 300,000 tons of fine carbon soot particles.  
(U.S. EPA, "National Air Quality and Emission Trends Report, 1998", p.124, March 2000)
- The largest share of power plant-derived fine particle pollution comes from the conversion of SO<sub>2</sub> and NO<sub>x</sub> into fine particle sulfate and nitrate.  
(Wilson and Spengler, "Particles in Our Air: Concentrations and Health Effects, 1999, p.46)

### Health impacts from air pollution from power plants

- Numerous studies over the years have linked fine particles to a variety of health damages, from increased asthma attacks to hospital visits to death.  
(Spengler, "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants" , Harvard School of Public Health, September 2000).
- Researchers at the Harvard School of Public Health have estimated that power plants are responsible for approximately 15,000 deaths per year (i.e. one quarter of an assumed 60,000 fine particle related deaths per year).  
(Wilson and Spengler, "Particles in Our Air: Concentrations and Health Effects, 1999, p.212)
- A recent Harvard School of Public Health study of two coal-fired power plants in Massachusetts found that the fine particle pollution from these plants may be associated with over 100 deaths annually.

(Levy and Spengler, "Estimated Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants, Harvard School of Public Health, May 2000)

- Abt Associates finds over 30,000 deaths each year are attributable to fine particle pollution from U.S. power plants. It is further stated that hundreds of thousands of Americans suffer from asthma attacks, cardiac problems and upper and lower respiratory ailments associated with fine particles from power plants. The table below shows the U.S. Power Plant Health Impacts:

<b>Health Effect</b>	<b>Study</b>	<b>Cases per year</b>
<b>Mortality</b>	HEI, 2000 Pope Reanalysis (Annual mean, All Cause)	30,100
<b>All Respiratory and Cardiovascular Hospitalisations</b>	Pooled COPD+Respiratory+ Asthma+cardio Vascular	20,100
<b>Asthma-Related Emergency Room Visits</b>	Schwartz et al., 1993	7,160
<b>Chronic Bronchitis</b>	Pooled	18,600
<b>Asthma Attacks</b>	Whittemore and Korn, 1980	603,000

Source: (Spengler, "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants" , Harvard School of Public Health, September 2000).

- Metropolitan areas with large populations near coal-fired power plants feel their impacts most acutely. In large metropolitan areas, many hundred of lives are shortened each year.  
(Spengler, "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants" , Harvard School of Public Health, September 2000).
- While all of us are at risk from exposure to fine particles, the elderly people with respiratory disease and children are at greatest risk.  
(Spengler, "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants" , Harvard School of Public Health, September 2000).
- Tens of thousands of elderly people die each year from exposure to ambient levels of fine particles. Breathing fine particles can hurt them with heart or lung disease, emphysema and chronic bronchitis.  
(Spengler, "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants" , Harvard School of Public Health, September 2000).
- Infants in high pollution areas were 40 percent more likely to die of respiratory causes.  
(Ibid)

- Excluded from these estimates are the health effects from other power plant pollutants, such as air emissions that result in ozone smog, air toxics, and the impacts from the consumption of fish contaminated by power plant mercury emissions.

*(Spengler, "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants" , Harvard School of Public Health, September 2000).*

*Source of Information: Spengler, J.D., "Death, Disease and Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants", Harvard School of Public Health, September 2000. Also available online at <http://www.cleartheair.org>*

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