Appendix A: Description of Methodology

STATISTICAL METHODOLOGY: THE AIR QUALITY DATA.

Data Sources

The data on air quality throughout the United States were obtained from the U.S. Environmental Protection Agency's Air Quality System, formerly called Aerometric Information Retrieval System (AIRS) database. The American Lung Association contracted with A.S.L. & Associates, Helena, Montana, to characterize the hourly averaged ozone concentration information and the 24-hour averaged $PM_{2.5}$ concentration information for the 3-year period for 2000-2002 for each monitoring site.

Design values for the annual $PM_{2.5}$ concentrations by county were collected from data previously summarized by EPA and were used as reported September 9, 2003 by EPA at http://www.epa.gov/airtrends/pm25_design_values_2000-2002.pdf.

Ozone Data Analysis

The 2000, 2001, and 2002 AIRS hourly ozone data were used to calculate the daily 8-hour maximum concentration for each ozone-monitoring site. The data were considered for a 3-year period for the same reason that EPA uses 3 years of data to determine compliance with the ozone: to prevent a situation in any single year, where anomalies of weather or other factors create air pollution levels, which inaccurately reflect the normal conditions. The highest 8-hour daily maximum concentration in each county for 2000, 2001, and 2002, based on the EPA-defined ozone season, was identified.

Using these results, A.S.L. & Associates prepared a table by county that summarized, for each of the 3 years, the number of days the ozone level was within the ranges identified by EPA based on the EPA Air Quality Index:

0.000 – 0.064 ppm	Good (Green)
0.065 – 0.084 ppm	Moderate (Yellow)
0.085 – 0.104 ppm	Unhealthy for Sensitive Groups (Orange)
0.105 – 0.124 ppm	Unhealthy (Red)
0.125 – 0.374 ppm	Very Unhealthy (Purple)

No data capture criteria were used to eliminate monitoring sites. All data within the ozone season were used in the analysis because it was the goal to identify the number of days that 8-hour daily maximum concentrations occurred within the defined ranges.

Following receipt of the above information, the American Lung Association identified the number of days each county, with at least one ozone monitor, experienced air quality designated as orange, red, or purple.

Short-term Particle Pollution Data Analysis

A.S.L. & Associates identified the maximum daily 24-hour AIRS $PM_{2.5}$ concentration for each county in 2000, 2001, and 2002 with monitoring information. Using these results, A.S.L. & Associates prepared a table by county that summarized, for each of the 3 years, the number of days the maximum of the ***daily*** $PM_{2.5}$ concentration was within the ranges identified by EPA based on the EPA Air Quality Index:

from 0.0 $\mu g/m^3$ to 15.4 $\mu g/m^3$	Good (Green)
from 15.5 $\mu g/m^3$ to 40.4 $\mu g/m^3$	Moderate (Yellow)
from 40.5 $\mu g/m^3$ to 65.4 $\mu g/m^3$	Unhealthy for Sensitive Groups (Orange)
from 65.6 $\mu g/m^3$ to 150.4 $\mu g/m^3$	Unhealthy (Red)
from 150.5 $\mu g/m^3$ to 250.4 $\mu g/m^3$	Very Unhealthy (Purple)
greater than or equal to 250.5 $\mu g/m^3$	Hazardous (Maroon)

AIR QUALITY INDEX (AQI)
GREEN Good
YELLOW Moderate
ORANGE Unhealthy for Sensitive Groups
RED Unhealthy
PURPLE Very Unhealthy
MAROON Hazardous

No data capture criteria were used to eliminate monitoring sites. All data were used in the analysis because it was the goal to identify the number of days that the maximum in each county of the ***daily*** AIRS $PM_{2.5}$ concentration occurred within the defined ranges.

Following receipt of the above information, the American Lung Association identified the number of days each county, with at least one $PM_{2.5}$ monitor, experienced air quality designated as orange, red, or purple.

Description of County Grading System.

Ozone and short-term particle pollution (24-hour $PM_{2.5}$)

The grades for ozone and short-term particle pollution (24-hour $PM_{2.5}$) were based on a weighted average for each county calculated using the Air Quality Index as noted above. The number of orange days experienced by each county was assigned a factor of 1; red days were assigned a factor of 1.5 and purple days were assigned a factor of 2. By multiplying the total number of days within each category by their assigned factor, a total was determined. Because the monitoring data was collected over a 3-year period, the total was divided by three to determine the weighted average. Each county's grade was determined using the weighted average. Counties were ranked by weighted average. Metropolitan areas were ranked by the highest weighted average among the counties in the Census Bureau-defined Metropolitan Statistical Area. In 2003, the U.S. Census Bureau published revised definitions for the nation's Metropolitan Statistical Areas. Therefore, comparisons between MSAs of previous reports and the ***State of the Air: 2004*** should be made with caution.

All counties with a weighted average of zero (corresponding to no exceedences of the 8-hour standard over the 3-year period) were given a grade of "A." Counties with a weighted average of 0.3 to 0.9 (corresponding to 1 to 2 orange days) received a "B." Counties receiving a "C" had only 3 to 6 days over the standard, including at most one red day, scored a weighted average of 1.0 to 2.0. Counties received a "D" if they had a weighted average of 2.1 to 3.2, which meant they had 7 to 9 days over the standard. Counties with weighted averages of 3.3 or higher (corresponding to approximately the 8-hour standard) received an "F." These counties generally had at least 10 orange days or 9 days over the standard with at least one or more days in the red or purple category.

Grading System

Grade	Weighted Average	Approximate Number of Allowable Orange/Red/Purple Days
A	0.0	None
B	0.3 to 0.9	1 to 2 orange days with no red
C	1.0 to 2.0	3 to 6 days over the standard: 3 to 5 orange with no more than 1 red OR 6 orange with no red
D	2.1 to 3.2	7 to 9 days over the standard: 7 total (including up to 2 red) to 9 orange with no red
F	3.3 or higher	9 days or more over the standard: 10 orange days or 9 total including at least 1 or more red or purple

Weighted averages allow comparisons to be drawn based on severity of air pollution. For example, if one county had 9 orange days and 0 red days, it would earn a weighted average of 3.0 and a D grade. However, another county which had only 8 orange days, but it also had 2 red days, which signify days with more serious air pollution, would receive a F. That second county would have a weighted average of 3.7.

Note that this system differs significantly from the methodology EPA uses to determine violations of both the ozone standard and the 24-hour $PM_{2.5}$. EPA determines whether a county violates the standard based on the 4th maximum daily 8-hour ozone reading each year averaged over three years. Multiple days of unhealthy air beyond the highest four in each year are not considered. By contrast, the system used in this report recognizes when a community's air quality repeatedly results in unhealthy air throughout the three years. Consequently, some counties will receive grades of "F" in this report showing repeated instances of unhealthy air, while still meeting EPA's 1997 ozone standard or the 1-hour ozone standard set in 1979.

Long-term particle pollution (Annual $PM_{2.5}$)

Since no comparable Air Quality Index exists for long-term particle pollution (annual $PM_{2.5}$), the grading was based on EPA's determination of violations of the national ambient air quality standard for annual $PM_{2.5}$ of 15 $\mu g/m^3$, as reported September 9, 2003 by EPA at http://www.epa.gov/airtrends/pm25_ design_ values_2000-2002.pdf. Counties that EPA listed as being in attainment of the standard were given grades of "Pass." Counties EPA listed as being in nonattainment were given grades of "Fail." Where insufficient data existed for EPA to determine attainment or nonattainment, those counties received a grade of "Incomplete." Counties were ranked by design value. Metropolitan areas were ranked by the design value among the counties in the Census Bureau-defined Metropolitan Statistical Area as of 2003. The design value is the calculated concentration of a pollutant based on the form of the national ambient air quality standard, and is used by EPA to determine whether or not the county meets the standard.

Calculations of Populations-at-Risk

Presently, state (with the exception of adult asthma) and county-specific measurements of the number of persons with chronic and acute lung disease are not available. In order to assess the magnitude of lung disease at the state and county levels, we have employed a synthetic estimation technique originally developed by the U.S. Bureau of the Census. This method uses age-specific national estimates of self-reported lung disease to project the prevalence of lung disease within the counties served by Lung Association constituents and affiliates.

Population Estimates

The U.S. Census Bureau estimated data on the total population of each county in the United States for 2002. The Census Bureau also estimated the age specific breakdown of the population by county.

Prevalence Estimates

Chronic Bronchitis, Emphysema and Pediatric Asthma. In 2002, the National Health Interview Survey (NHIS) estimated the nationwide annual prevalence of diagnosed chronic bronchitis at 9.1 million; the nationwide lifetime prevalence of emphysema was estimated at 3.1 million. The NHIS estimates the prevalence of diagnosed pediatric asthma to be over 6.0 million under age 18.

Due to the revision of the Health Interview Survey questionnaire, prevalence estimates from the 2000 *State of the Air* Report cannot be compared to later publications. Estimates for chronic bronchitis and emphysema can be compared to the 2001, 2002, and 2003 *State of the Air* Reports. However, estimates for chronic bronchitis and emphysema cannot be summed since they represent different types of prevalence estimates.

Pediatric asthma prevalence estimates from this year's report cannot be compared to previous estimates, due to another change to the National Health Interview Survey. Pediatric asthma prevalence estimates found in this report represent current asthma prevalence, not asthma attack prevalence as was depicted in the past three *State of the Air* Reports. Subsequently, pediatric asthma estimates will be much higher in this report than in previous ones due to the nature of the question.

Local area prevalence of chronic bronchitis, emphysema and pediatric asthma are estimated by applying age-specific national prevalence rates from the 2002 NHIS to age-specific county-level resident populations obtained from the U.S. Bureau of the Census web site. Prevalence estimates for chronic bronchitis and emphysema are calculated for those 18-44, 45 to 64 and 65+. The prevalence estimate for pediatric asthma is calculated for those under age 18.

Adult Asthma. In 2002, the Behavioral Risk Factor Surveillance System (BRFSS) survey indicated that approximately 7.5% of adults residing in the United States reported currently having asthma. The information on adult asthma obtained from the Behavioral Risk Factor Surveillance System survey cannot be compared with pediatric asthma estimates that come from the National Health Interview Survey.

The prevalence estimate for adult asthma is calculated for those 18 to 44, 45 to 64 and 65+. Local area prevalence of adult asthma is estimated by applying age-specific state prevalence rates from the 2002 BRFSS to age-specific county-level resident populations obtained from the U.S. Bureau of the Census web site.

Cardiovascular Disease Estimates. All cardiovascular disease estimates were obtained from the *American Heart Association: Heart Disease and Stroke Statistics – 2004 Update*. According to this report, 64.4 million Americans suffer from one or more types of cardiovascular disease.

Local area prevalence of cardiovascular disease is estimated by applying age-specific prevalence rates from the 2004 American Heart Association Report to age-specific county-level resident populations obtained from the U.S. Bureau of the Census web site.

Limitations of Estimates. Since the statistics presented by the NHIS and the BRFSS are based on a sample, they will differ (due to random sampling variability) from figures that would be derived from a complete census, or case registry of people in the U.S. with these diseases. The results are also subject to reporting, non-response and processing errors. These types of errors are kept to a minimum by methods built into the survey.

Additionally, a major limitation of both surveys is that the information collected represents self-reports of medically-diagnosed conditions, which may underestimate disease prevalence since not all individuals with these conditions have been properly diagnosed. However, the NHIS is the best available source that depicts the magnitude of acute and chronic lung disease on the national level, and the BRFSS is the best available source for adult asthma information.

The conditions covered in the survey may vary considerably in the accuracy and completeness with which they are reported.

Local estimates of chronic lung diseases are scaled in direct proportion to the base population of the county and its age distribution. No adjustments are made for other factors that may affect local prevalence (e.g. local prevalence of cigarette smokers or occupational exposures) since the health surveys that obtain such data are rarely conducted on the county level. Because the estimates do not account for geographic differences in the prevalence of chronic and acute diseases, the sum of the estimates for each of the counties in the United States may not exactly reflect the national estimate derived by the NHIS or state estimates derived by the BRFSS.

REFERENCES

Irwin, R. Guide to Local Area Populations U.S. Bureau of the Census Technical Paper Number 39 (1972).

National Center for Health Statistics. Raw Data from the National Health Interview Survey, United States, 2002. Calculations by the American Lung Association Research and Scientific Affairs Division using SPSS and SUDAAN software.

Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System, 2002.

Population Estimates Branch, U.S. Bureau of the Census. County Resident Population Estimates, by Age, Sex, and Race: July 1, 2002.

American Heart Association: Heart Disease and Stroke Statistics – 2004 Update.

Appendix B: Regional Differences in Sources for Ozone and Particle Pollution

Introduction

Ozone requires the right mix of two essential groups of gases: volatile organic compounds (VOCs) and nitrogen oxides (NO_x). When those gases are combined in sunlight with the right amount of heat, ozone forms. Particle pollution ($PM_{2.5}$) can be formed directly by mechanical processes, such as dust is formed by wind action on soil and rocks, but it is frequently formed by chemical reactions in the atmosphere. For more discussion on the formation of these two pollutants, see the chapter "Health Effects of Ozone and Particle Pollution."

However, the sources of these pollutants, the success at reducing them and the complications of pollution transported by the winds vary from region to region. The following analysis looks at the sources, trends and transport of ozone and particle pollution in each of the ten regions that EPA uses to group the states.

National Sources of Ozone and Particle Pollution

All the data on emissions of VOCs, NO_x and $PM_{2.5}$ in this appendix were obtained from the U.S. EPA's National Emissions Trends Tier reports for 1999 inventoried data. Those data include emissions not only from individual facilities (called point sources), but also from so-called area sources that include many small, individual sources (like cars or residences) and sources that cover a large geographic area, such as wildfires. The data are estimated annually, but the sources are inventoried only every three years. The 1999 data are the most current based on inventories of sources. The data are available at http://www.epa.gov/air/data/nettier.html?us~USA~United%20States.

The National Emissions Trend Tier data were sorted by region, by major source category, and by pollutant for this discussion. A brief description from EPA follows to explain each of the major source categories. Omitted from this discussion are those sources that are not anthropogenic, or not generated by human activity,[1] including fugitive dust in the discussion of particle pollution and isoprenes from vegetation in the discussion of VOC sources.

What do the categories in these pie charts mean?

Category	**Includes these activities or sources**
Electric Utility Fuel Combustion	Power plants that produce electricity
Industrial Fuel Combustion	Boilers and other processes that burn fuel at industrial plants
Other Fuel Combustion	Residential woodstoves and fireplaces; other processes burning fuel in residential, commercial and institutional settings
Chemicals and Allied Products	Industries that produce chemicals and related products
Metals Production	Industries that produce metals and metal products
Petroleum and Related Products	Rubber and plastics production; oil and gas production; petroleum refining
Other Industrial Production	Agriculture, food, and related products; wood, pulp, and paper; machinery, mineral products
Solvent Use	Graphic arts, dry cleaning, surface coating, degreasing processes, pesticide applications
Storage and Transport	Storage and transport of petroleum and petroleum products, including service stations and bulk terminals and plants and organic chemicals, rail and tank car cleaning
Waste Disposal and Recycling	Wastewater treatment; treatment, storage and disposal facilities; incineration, open burning; scrap and waste materials; landfills
Highway Vehicles	Cars, trucks, buses
Off Highway Vehicles	Recreational vehicles, construction equipment, marine, rail
Miscellaneous	Cooling towers, firefighter training, engine testing, forest fires, slash/prescribed burning

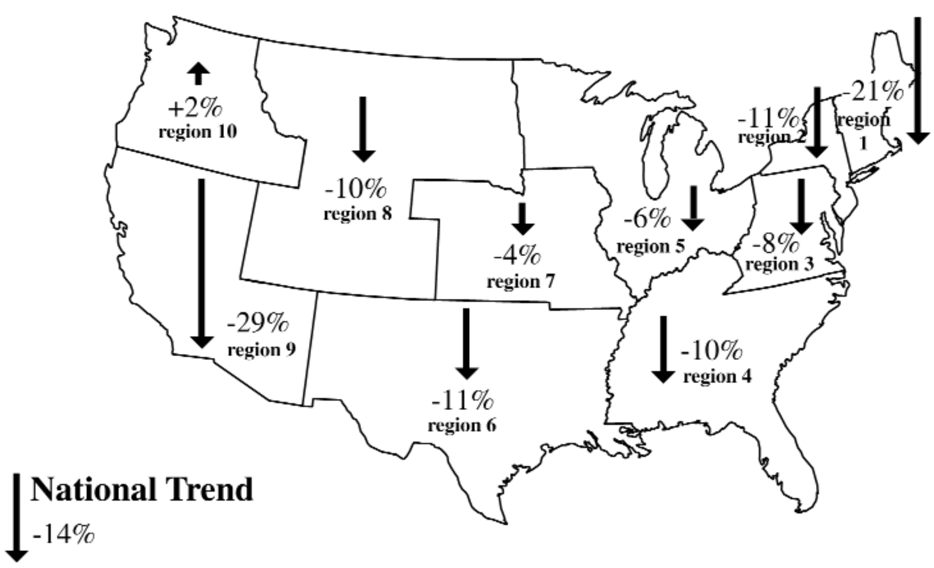
Source: EPA, *Handbook for Criteria Pollutant Inventory Development: A Beginners Guide for Point and Area Sources*, 1999.

Ozone Trends

Nationally, we have seen a significant improvement in the past 20 years in monitored ozone levels with a decline of 14 percent between 1983 and 2002.[2] The EPA map below shows that the success has varied greatly by region. The most successful improvement is Region 9, with the steepest drop of 29 percent led by California's stringent controls. The most surprising trend is the increase of 2 percent in the Northwest in Region 10. More ominously, if this map depicted trends for the period 1990-1999 only, EPA reports a 4 percent **increase** in ozone levels between 1993 and 2002 across the nation, though they report that this increase is not statistically significant. Even accepting EPA's determination that this is not a significant change, the stagnation in the ozone trend is clear. Furthermore, when EPA analyzed the 1983 to 2002 trend for 53 metropolitan areas and adjusted the data for the influences of local weather patterns, the trend remained flat.[3]

The trend data by region covers 1991-2000, which is the latest made available by EPA in its annual Trends report. The largest decline in ozone concentrations between 1991 and 2000 came in Region 1, with a decline of nearly 22 percent, followed by Region 2 with a 17.4 percent drop, and Region 9 with 14.4 percent decline. Region 6 had the largest increase in that decade, with 8.9 percent increase in monitored ozone levels, while two other regions (7 and 8) also increased monitored 8-hour ozone emissions. Compared to the trend findings reported in the ***American Lung Association State of the Air: 2003,*** several regions showed a positive turn-around: for example, Region 4 which had increased by 9 percent between 1990-1999, showed a drop of 12 percent between 1991 and 2000. Region 5 had increased ozone levels by 7 percent between 1990-1999, showed a drop of 11.5 percent between 1991 and 2000. Some of this monitored volatility is likely due to meteorological changes.[4] For more discussion of the differences in 8-hour ozone trends, see the descriptions below for each region.

Trends in 8-hour Ozone levels, 1983-2002, averaged across EPA regions, based on the annual fourth maximum 8-hour average.



Map redrawn from EPA. National Air Quality and Emissions Trends Report, 2003 Special Studies Edition. Washington, DC.: U.S. Government Printing Office; 2003. EPA Publication No. 454/R-03-005.

Note on Regional Trends

Because air quality monitors are concentrated in urban locations, it is not possible, strictly speaking, to describe accurately average ozone or $PM_{2.5}$ concentrations across as large an area as an EPA Region. EPA includes this reminder in its discussion of the trend data: "These trends are influenced by the distribution of monitoring locations in a given region and, therefore, can be driven largely by urban concentrations. For this reason, they are not indicative of background regional concentrations."[5] For more discussion on regional trends, see EPA's annual National Air Quality and Emissions Trends Report, 2003, at http://www.epa.gov/oar/aqtrnd03/.

The Transport of Pollution

By their nature, ozone and much of the particle pollution are created in the atmospheric mixing bowl and carried by prevailing winds to areas often far beyond their sources. Section 110 of the Clean Air Act recognizes the impact of pollution transported across political boundaries, by requiring communities to prevent sources from "contributing significantly" to downwind areas. When that doesn't work, Section 126 of the Act allows downwind states to petition EPA to step in and act to reduce industrial pollution from upwind sources.

The most comprehensive effort to reduce transported ozone is currently in progress. Years of study in the 1990s had identified significant sources of NO_x, largely from electric power plants, which were contributing to the ozone levels in much of the Northeast. At the request of 8 Northeastern states, EPA issued a rule in September 1998 targeting most of the eastern United States, a requirement commonly referred to as the NO_x SIP call.[6] This rule required 22 states and the District of Columbia to significantly reduce NO_x emissions by May 1, 2003, a date that was later extended to May 31, 2004 by court action for most of the states.[7] The states included in the requirement are: Alabama, Connecticut, Delaware, Georgia, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Michigan, Missouri, North Carolina, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, Wisconsin, and West Virginia.

Pollution is also transported across national borders. For example, ozone is produced south and west of the New England states in the Ohio Valley and in the Canadian "Windsor-Quebec Corridor." In those two areas, heavy concentrations of power plants and transportation corridors produce ozone, which is carried into New England and the Mid-Atlantic states (EPA Regions 2 & 3), as well as into New Brunswick and other Canadian provinces.[8]

Not only does pollution move into a state from the outside, it also moves within the state. For example, some air pollution episodes have been followed hour-by-hour as they move up downwind from city to city within Pennsylvania.[9] In many cases, the highest levels of ozone will show up in suburban areas downwind of larger communities. For example, even though an area such as San Francisco County in California may not be experiencing high ozone readings, it may be contributing to poor air quality in outlying areas such as the Sacramento and San Joaquin Valley areas to the East and other parts of the Bay Area to the south.[10]

There are some regions that are notable as sources of transported pollutants affecting cities and states within the region and outside it. The Southeast (EPA Region 4) and the Midwest (EPA Region 5) are two. The Southeast is home to some of the most polluting power plants in the nation[11] and to cities with extremely high driving rates. Atlanta residents average 37.6 miles per day; Birmingham, 35.6; and Asheville, North Carolina, 47.5 — all of them much higher than the traditionally car-dependent Los Angeles, whose residents average only 22.2 miles each day.[12] As a result, the Southeast produces more NO_x emissions (5.4 million short tons in 1999), VOC emissions (4.15 million short tons) and particle pollution (830,992 short tons) than any other section of the country.

The Midwest (EPA Region 5) is another region with many of the nation's most polluting coal-fired power plants, including 8 of the top 20 NO_x emitting facilities in the nation in 1999.[13] This region produces the second highest NO_x emissions, 4.98 million short tons, the second highest VOC emissions, 3.5 million short tons, and the second highest particle pollution emissions, 679,792 short tons, in 1999.[14]

National Sources of VOC Emissions

According to the 1999 inventory of emissions, which is the latest inventory data available, transportation sources accounted for the bulk of emissions of VOCs, totaling nearly half (47%) of the emissions between the highway vehicles and the off-highway vehicles. Solvent use accounted for over one-quarter (27%) of VOC emissions. All other categories made up the remaining quarter, led by storage and transportation uses at 7 percent.

National Sources of NO_x

Transportation also comprised over half the sources of NO_x emissions in the 1999 inventory as well, with highway vehicles producing 33 percent and off-highway generating another 22 percent. However, electric utilities generated nearly one-quarter of the total, at 23 percent. The remaining quarter was led by industrial fuel combustion at 12 percent.

National Sources of Particle Pollution ($PM_{2.5}$)

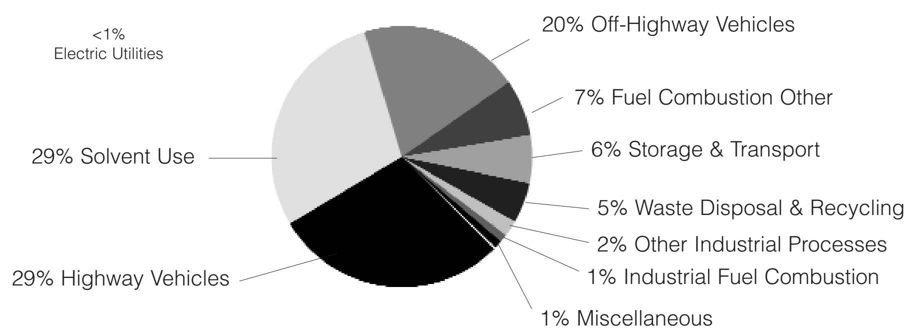
Not including fugitive dust sources, over 4.5 million short tons of particle pollution were produced nationwide in 1999. Categorized as *miscellaneous*, together, other combustion, and agriculture and forestry comprised 47 percent of all particle pollution or nearly 2.2 million short tons, the largest source of particle pollution emissions in the nation. Nationwide, the next largest categories of particle pollution emissions sources are other fuel combustion (12%), waste disposal and recycling (10%), off-highway vehicles (7%), and industrial fuel combustion (6%).

Region 1: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont

Local sources of VOCs

VOC sources in this region are very similar to those in the nation as a whole. The largest sources generated by human activity are highway vehicles and solvent uses, which make up 29 percent each. Off-highway vehicles make up 20 percent. The next largest categories are other fuel combustion (7%), storage and transport (6%) and waste disposal and recycling (5%). Total tons generated by human activity in 1999 were 747,249, the lowest of all the 10 regions.

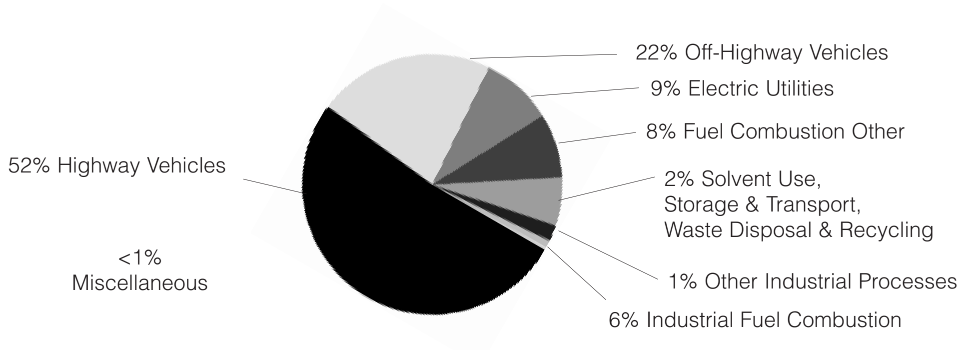
Sources of VOC Emissions in Region 1- 1999
Anthropogenic Sources Only



Local sources of NO_x

Highway vehicles make up a much larger percentage of NO_x emissions in New England than in the nation as a whole. Off-highway vehicles are the same percentage as the nation (22%). However, cleaner power plants in the region result in electric utilities contributing only 9 percent of the region's NO_x emissions. Other fuel combustion (8%) generates a slightly higher percentage of NO_x than the nation as a whole, while NO_x from industrial fuel consumption is much lower than the nation at 6 percent. Total tons generated by human activity in 1999: 745,050, the lowest of all the regions.

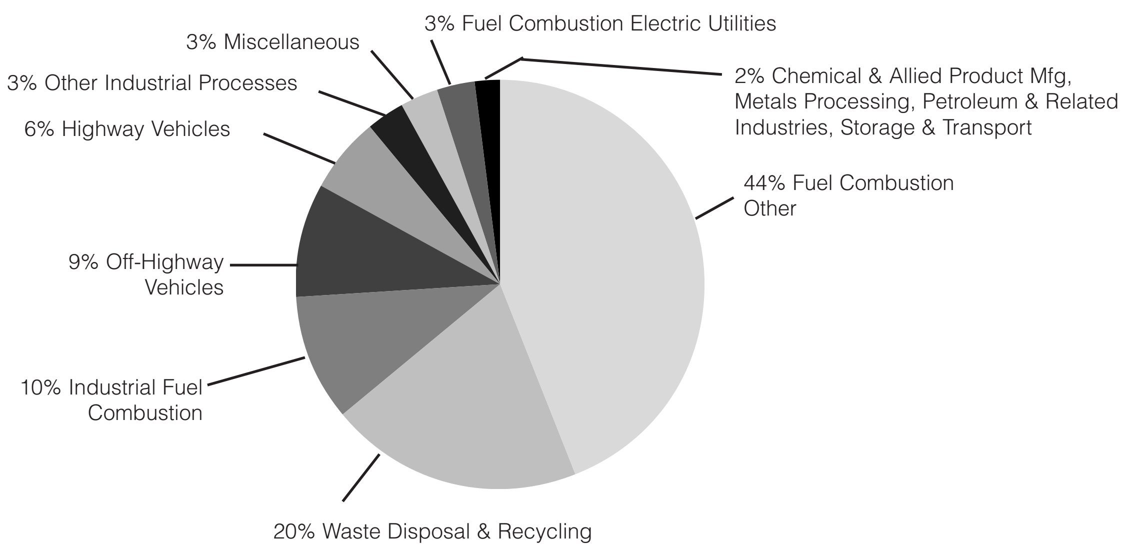
Sources of NO_X Emissions in Region 1- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

Other fuel combustion sources from residential woodstoves and fireplaces and other processes burning fuel in residential, commercial and institutional settings comprised the largest source of particle pollution in New England (44%); this figure exceeds the national average for particle pollution by other fuel combustion by 36 percent. Particle pollution from waste disposal and recycling (20%) was twice the national average. Other major sources of particle pollution in the region stem from industrial fuel combustion (10%), off-highway vehicles (9%), and highway vehicles (6%). Miscellaneous sources of particle pollution emissions were a mere 3 percent, compared to the national average of 47 percent. Region 1 identified 126,024 short tons of particle pollution in the 1999 inventory; it produced the least particle pollution nationwide.

Particulate Matter in Region 1



Trends

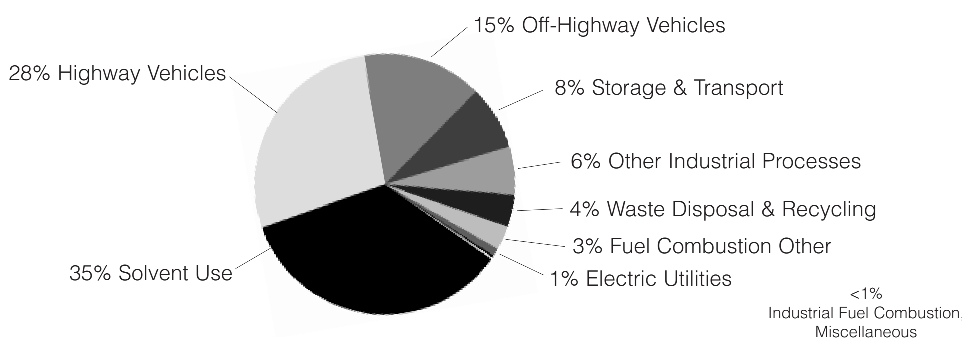
Ozone levels have declined significantly in Region 1, more than in the nation as a whole. Region 1 has seen more reductions in ozone levels than all other regions except Region 9. Levels have declined by 21 percent from 1983 to 2002, compared with the national levels, which have dropped by 14 percent in that time frame.[15] Furthermore, ozone levels in the region declined the most of any region during the period 1991 to 2000, dropping by 21.9 percent. Comparable trend data are not available for $PM_{2.5}$ levels.[16]

Region 2: New Jersey, New York and Puerto Rico

Local sources of VOCs

In Region 2, more than one-third of human-created VOCs come from solvent use, compared with the nation as a whole, where only 27 percent come from those sources. The region's vehicles, both highway and off-road, generate about the same portion of VOCs in these states as they do in the nation (28% and 15% respectively in the region, versus 29% and 18% nationally). Industrial sources, including chemical, metals, petroleum and other industries, comprise 6 percent, which is comparable to the national rate of 7 percent. In 1999, Region 2 produced 1.149 million tons of VOCs.

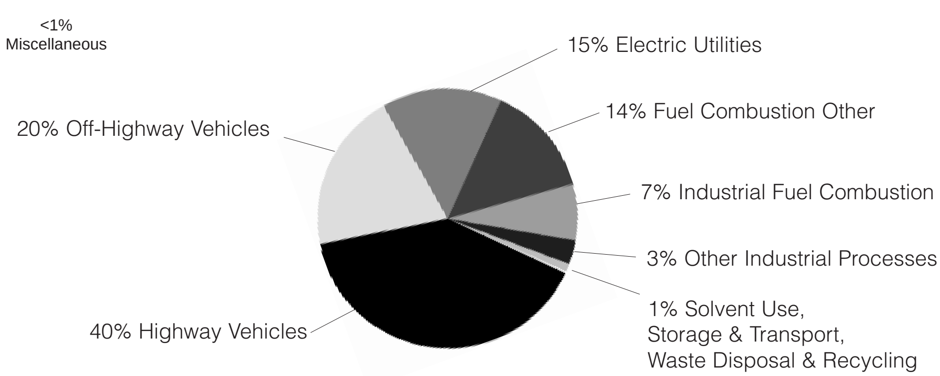
Sources of VOC Emissions in Region 2- 1999
Anthropogenic Sources Only



Local sources of NO_x

Highway vehicles represent a much higher portion of NO_x emissions in Region 2 (40%) than the nation as a whole (33%). The portion from off-highway vehicles is slightly lower in the Region, at 20 percent, than the national percentage (22%). Significantly, emissions from electric utilities are much lower, at 15 percent, than nationally (23%). Industrial fuel combustion is also much lower, at 7 percent than the national percentage (12%), but combustion from other sources is significantly higher (14% versus 5%), so the percentage of total fuel combustion from all three sources (electric utilities, industrial and others) is slightly less in the region (36%) than the national rate (40%). In 1999, Region 2 produced 1.305 million tons of NO_x.

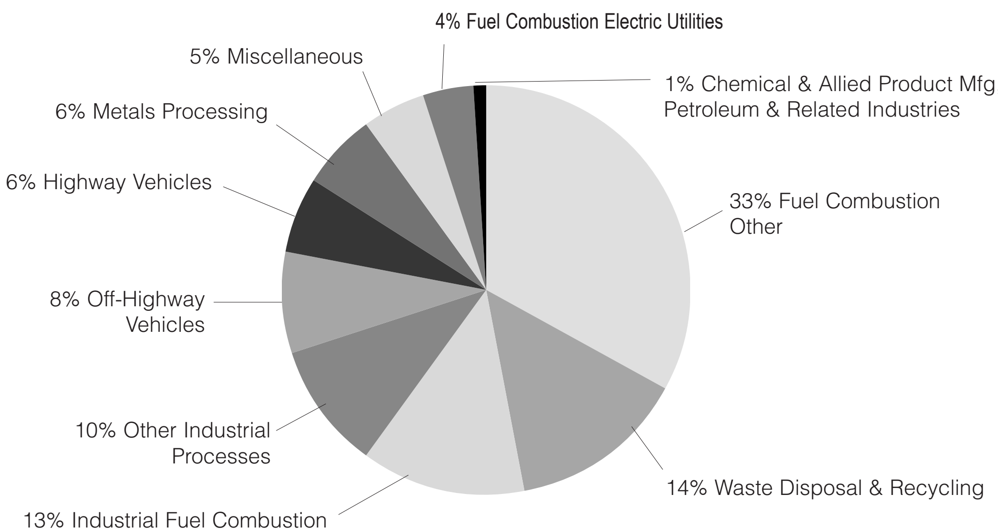
Sources of NO_X Emissions in Region 2- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

In New Jersey, New York and Puerto Rico, other fuel combustion was the largest source of particle pollution (33%), stemming from residential woodstoves and fireplaces, including other processes burning wood in residential, commercial and institutional settings. This category exceeds the national average for particle pollution by other fuel combustion by 21 percent. Fourteen percent of particle pollution emissions in Region 2 can be attributed to waste disposal and recycling; other major sources include industrial fuel combustion (13%) and other industrial processes (10%). Region 2 produced 211,026 short tons of particle pollution counted in the 1999 inventory.

Particulate Matter in Region 2



Trends

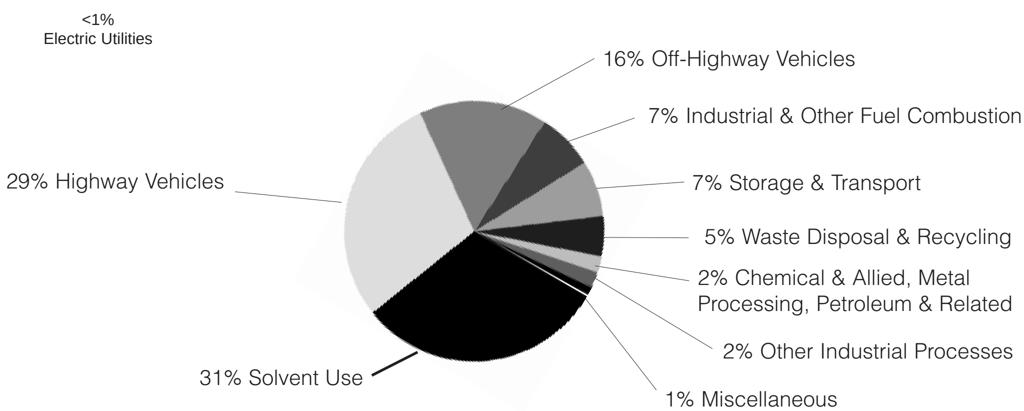
Ozone emissions in Region 2 declined by 11 percent from 1983 to 2002, a rate slightly slower than the nation as a whole, which dropped 14 percent in the same period. Greater progress was seen between 1991 and 2000, when the regional ozone level declined by 17.3 percent. Comparable trend data are not available for $PM_{2.5}$ levels.

Region 3: Delaware, Maryland, Pennsylvania, Virginia, Washington, DC, and West Virginia

Local sources of VOCs

According to EPA's emissions inventory, human activity in Region 3 in 1999 put 1.51 million tons of VOCs into the air. Once again, the transportation sector accounted for the single largest contribution to the inventory — 45 percent of the Region's emissions, 29 percent from highway vehicles, and 16 percent from off-road vehicles. Transportation generates a similar percentage nationally (47%), but Region 3's off-road vehicle sector is slightly smaller than the national highway vehicle sector (16% v 18%). The other significant source was the use of solvents, comprising 31 percent, nearly a third, of Region 3's emissions of VOCs, higher than the national percentage of solvent use (27%).

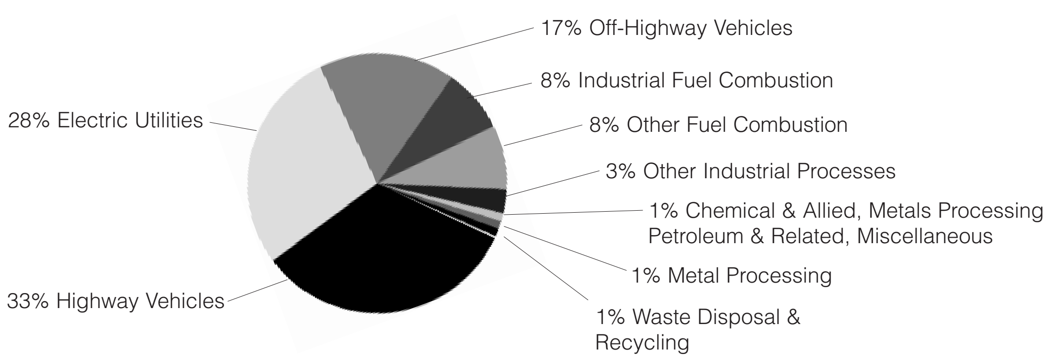
Sources of VOC Emissions in Region 3- 1999



Local sources of NO_x

According to EPA's emissions inventory, human activity in Region 3 in 1999 put 2.43 million tons of NO_x into the air. Fully half (50%) came from highway vehicles and off-highway vehicles. The other significant contributor was fuel combustion, comprising over 44 percent of Region 3's NO_x emissions. Contributions from electricity generation by utilities accounted for nearly two-thirds of this sector and over one-quarter of the whole (28%). Compared with the nation as a whole, Region 3 has a higher percentage from electric utilities (28% v 23% nationally) and a lower percentage from off-highway vehicles (17% v 22% nationally).[9]

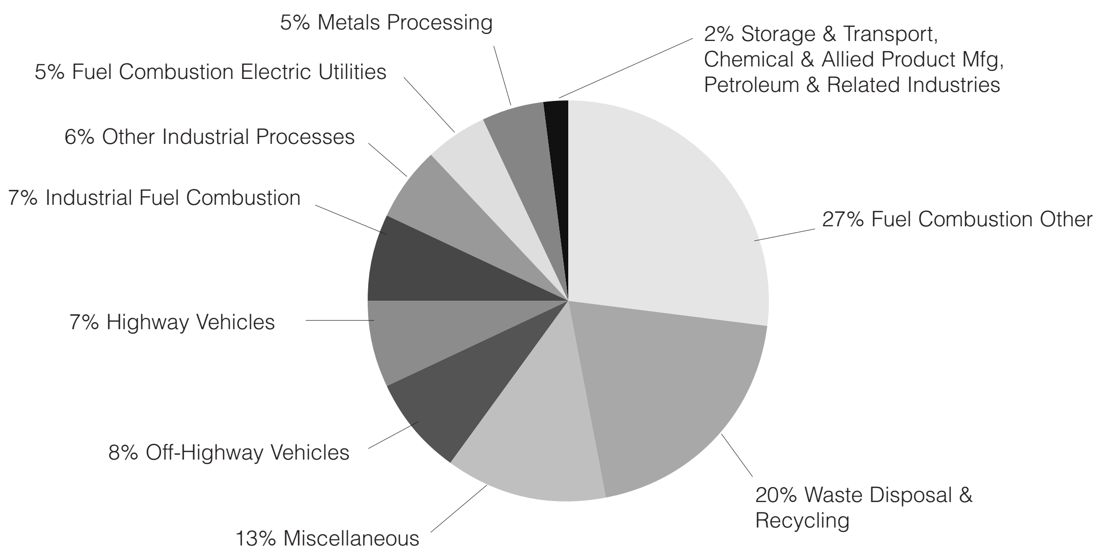
Sources of NO_X Emissions in Region 3- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

The Mid-Atlantic produced 259,183 short tons of particle pollution in 1999. Other fuel combustion was the largest point source of particle pollution (27%), stemming from residential woodstoves and fireplaces, including other processes burning wood in residential, commercial and institutional settings. Waste disposal and recycling followed closely at 20 percent and miscellaneous sources (13%) of particle pollution followed third, stemming from other combustion, agriculture and forestry. Other sources of particle pollution in the region include off-highway vehicles (8%), highway vehicles (7%), industrial fuel combustion (7%), other industrial processes (6%), fuel combustion from electric utilities (5%), and metals processing (5%). Storage and transport, chemical and allied product manufacturing, petroleum and related industries produced a combined total of 2 percent of particle pollution emissions in the region.

Particulate Matter in Region 3



Trends

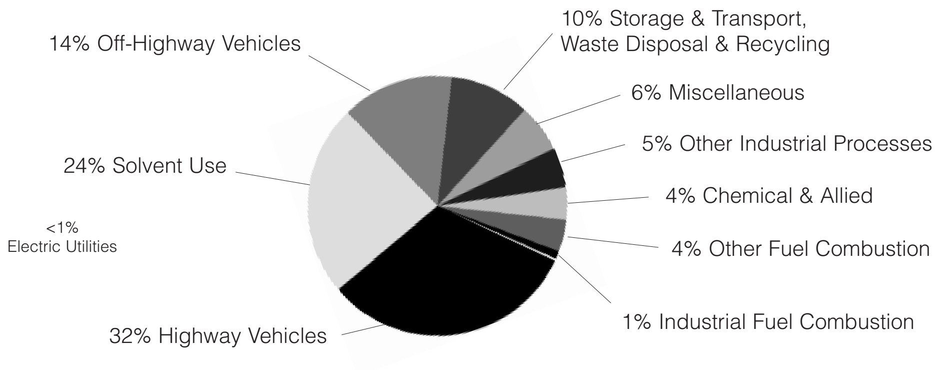
Monitored ozone levels dropped by 10.8 percent between 1983 and 2002, a trend much lower than the nation as a whole, which dropped 14 percent during the same period. However, during the period 1991-2000, the region's ozone levels dropped by 11.6 percent, fifth best drop among the regions. Comparable trend data are not available for $PM_{2.5}$ levels.

Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee

Local sources of VOCs

Region 4 produces more VOC emissions (4.15 million tons in 1999) than any other section of the country. The largest sources generated by human activity are transportation, which accounts for 46 percent, almost the same as the nation as a whole, which is 47 percent. Of these sectors, the percentage from highway vehicles is greater in the Southeast than it is in the nation (32% v 29% nationwide). Off-highway vehicle sources are lower in the Southeast than nationally (14% v 18%). Solvent use contributed 24 percent of VOCs in the Southeast, compared with 27 percent nationally.

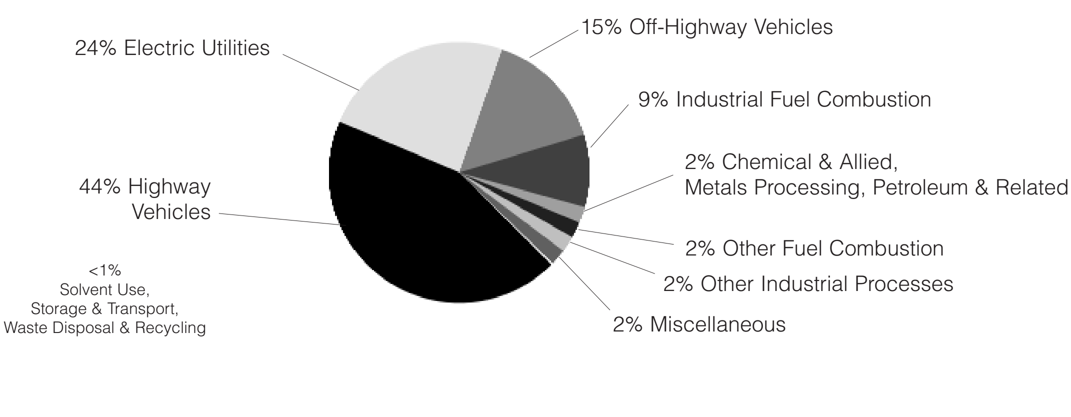
Sources of VOC Emissions in Region 4- 1999
Anthropogenic Sources Only



Local sources of NO_x

Region 4 produces more NO_x emissions (5.4 million tons in 1999) than any other section of the country. The transportation sectors make up a larger portion of the NO_x sources in the Southeast (59%) than they do in the nation as a whole (55%). This is largely due to highway vehicles, which produce a much larger portion of the total in the Southeast (44% v 33%). The next largest sources are emissions from electric utilities, at 24 percent, which is about same as nationally. Industrial fuel combustion makes up a lower percentage in the Southeast than nationwide (9% v 12%).

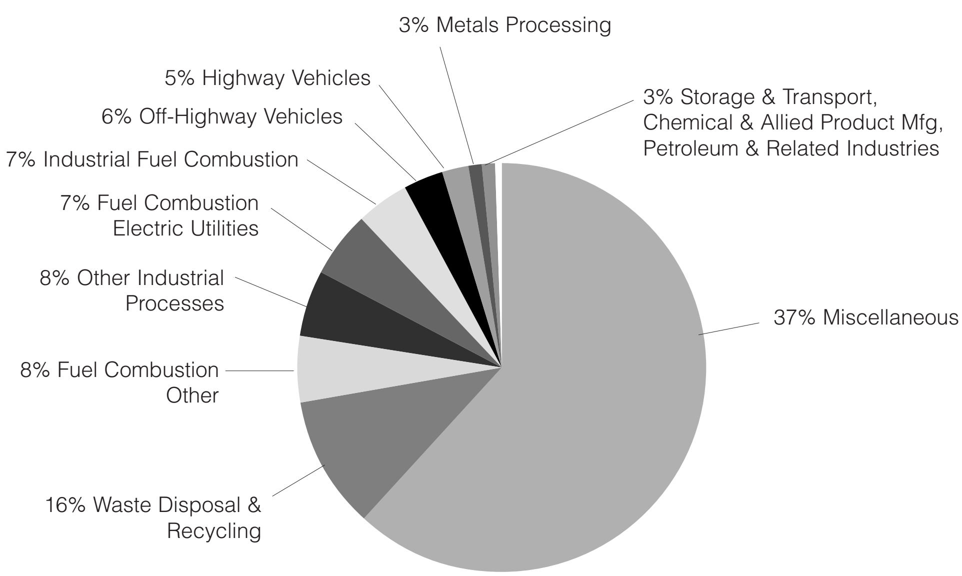
Sources of NO_x Emissions in Region 4- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

The Southeast produced 830,992 short tons of particle pollution emissions in the 1999 inventory; it produced the most particle pollution nationwide. Sources of particle pollution resembled the national composition, with miscellaneous sources of particle pollution stemming from other combustion, and agriculture and forestry at 37 percent; waste disposal and recycling (16%), other fuel combustion (8%), other industrial processes (8%), fuel combustion from electric utilities (7%), industrial fuel combustion (7%), off-highway vehicles (6%), highway vehicles (5%), metals processing (3%). Together, storage and transport, chemical and allied product manufacturing, petroleum and related industries, and solvent use comprised 3 percent of particle pollution emissions in the Southeast. Waste disposal and recycling in this region produced 131,314 short tons of particle pollution emissions in 1999; this figure represents over 29 percent of all particle pollution emissions stemming from waste disposal and recycling in the nation.

Particulate Matter in Region 4



Trends

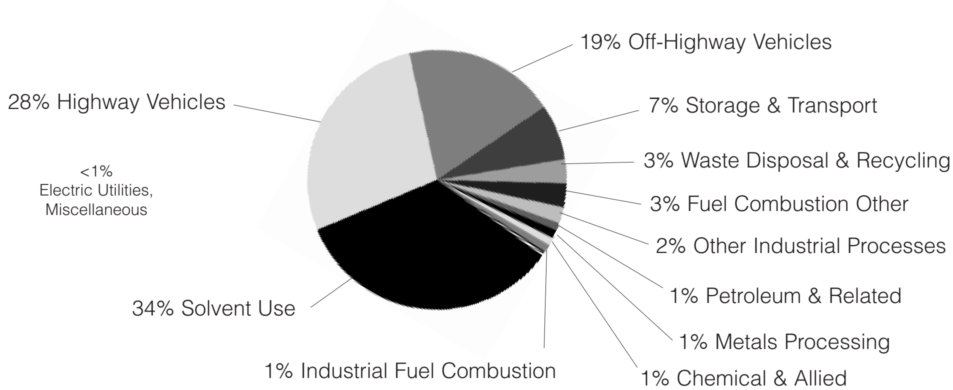
Monitored data show ozone levels in the Southeast have declined, but not as swiftly as the nation as a whole. The ozone levels dropped in the region by 10 percent from 1983 to 2002, but by slightly less than the nation as a whole which dropped by 14 percent. However, during the period 1991-2000, ozone levels in the Southeast dropped by 12 percent, fourth best performance by any national region. Comparable trend data are not available for $PM_{2.5}$ levels.

Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin

Local sources of VOCs

The Midwest produced the nation's second highest VOC emissions — 3.5 million tons — in 1999. The largest human activity generating VOCs in the Midwest is the use of solvents, which contributes 34 percent, much higher than the U.S. nationally (27%). Highway vehicles and off-highway vehicles are about the same as the nation as a whole (28% and 19% respectively, compared to 29% and 18% nationwide). Other sources are about the same as nationwide, with industry contributing 3 percent, fuel combustion contributing 3 percent, storage and transport 7 percent, and waste disposal and recycling 3 percent.

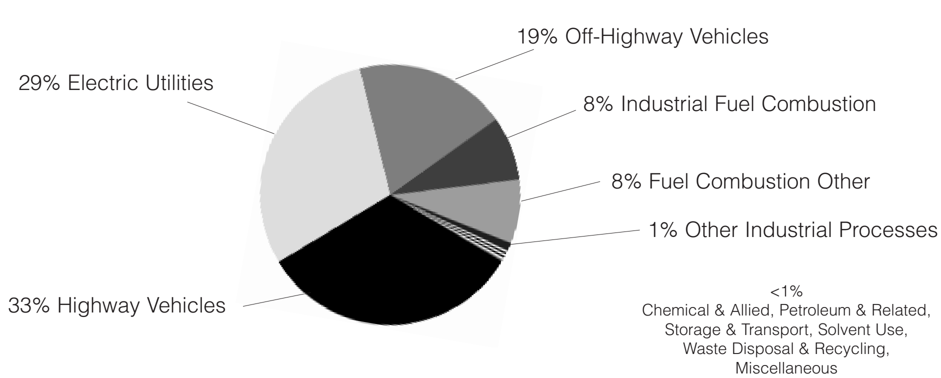
Sources of VOC Emissions in Region 5- 1999
Anthropogenic Sources Only



Local sources of NO_x

The Region produced the nation's second highest NO_x emissions — 4.98 million tons — in 1999. Highway vehicles generate the largest amount of NO_x in the Midwest, followed by electric utilities and off-highway vehicles. Highway vehicles generate about one-third of the NO_x, similar to their percentage nationwide. However, electric utilities generate 29 percent of the region's NO_x, compared with only 23 percent nationwide. Off-highway vehicles produce 19 percent, slightly less than the nation as a whole (22 percent). Contributions from industrial fuel combustion make up a third less in Region 5 than they do in the nation (8% compared to 12%).

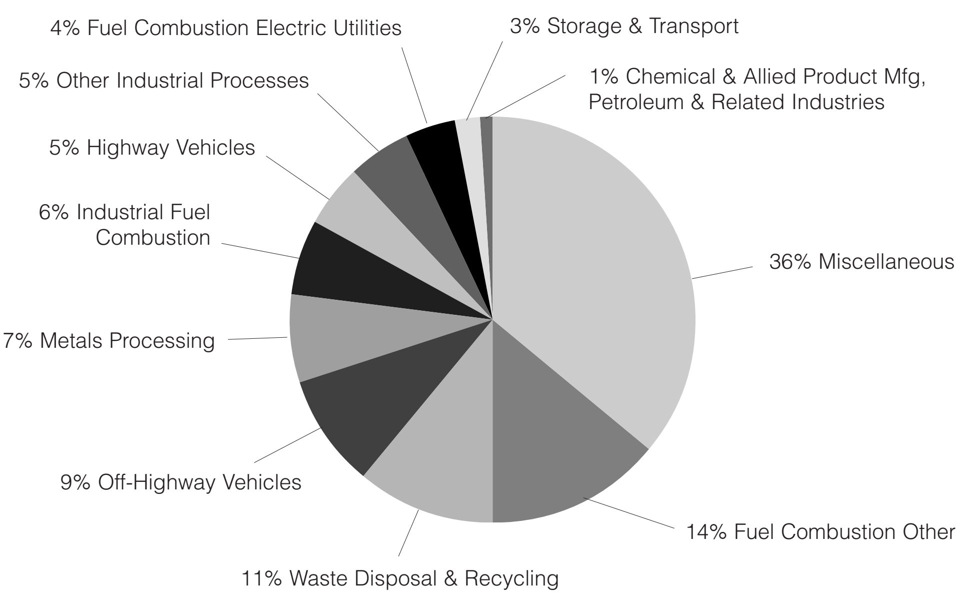
Sources of NOx Emissions in Region 5- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

The Midwest identified 679,792 short tons of particle pollution in the 1999 inventory; the region was the second largest producer of particle pollution nationwide. Miscellaneous sources of particle pollution from other combustion, and agriculture and forestry contributed 36 percent of the particle pollution in Region 5. Other fuel combustion from sources such as residential woodstoves and fireplaces comprised 14 percent of the particle pollution in the region, and waste disposal from open burning and recycling contributed 11 percent. Region 5 also produced the largest amount of particle pollution in the nation stemming from other fuel combustion sources, at 96,188 short tons. Particle pollution from transportation was similar to the nation as a whole, off-highway vehicles (9%) and highway vehicles (5%). Producing 7 percent of particle pollution emissions in the region, metals processing produced 46,914 short tons of particle pollution, more than any other region in the nation.

Particulate Matter in Region 5



Trends

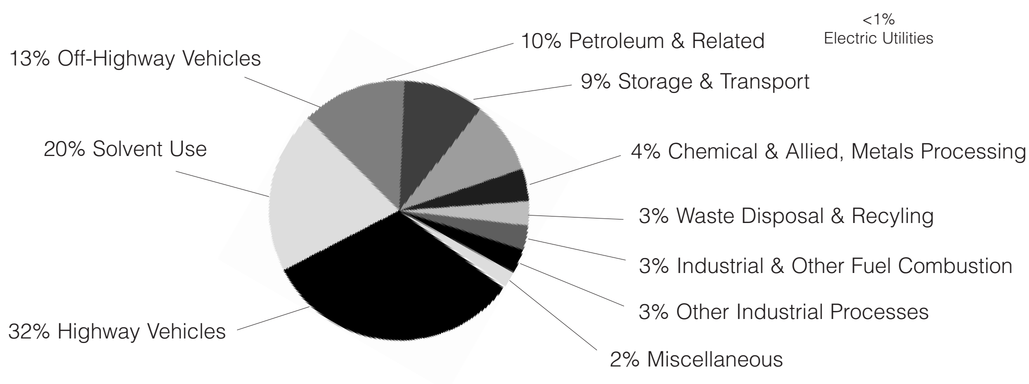
Monitored ozone levels dropped by 6 percent between 1983 and 2002, a trend far behind the nation as a whole, which dropped 14 percent during the same period. However, during the period 1991-2000, levels declined by 11.5 percent, 6th best regional decline in the nation. Comparable trend data are not available for $PM_{2.5}$ levels.

Region 6: Arkansas, Louisiana, Oklahoma, New Mexico, and Texas

Local Sources of VOCs

VOCs generated by human activity in this region include highway vehicles (32% compared with 29% nationally); off-highway vehicles (13% compared with 18% nationally); and solvents (20% regionally compared with a national rate of 27%). Region 6 had a higher rate of VOCs from petroleum and related products (10% regionally compared with 2% nationally), and storage and transport (9% regionally, compared with a national rate of 7%). This difference probably reflects the concentration of the petroleum industry in the region. Total VOCs inventoried in 1999 in Region 6 were 2.5 million short tons in 1999, the third highest.

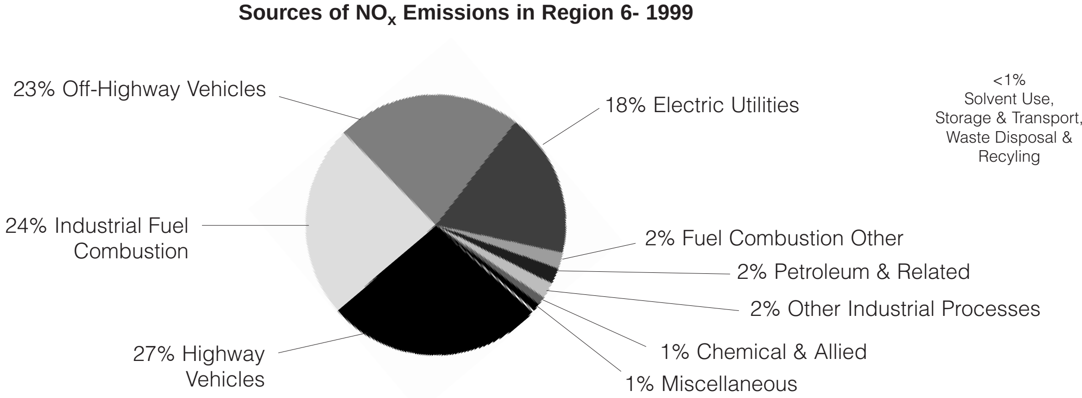
Sources of VOC Emissions in Region 6- 1999
Anthropogenic Sources Only



Local Sources of NO_x

Highway vehicles represented the largest source of NO_x in this region at 27 percent, lower than national rate of 33 percent. The next highest source of NO_x in the region is industrial fuel combustion, which, at 24 percent, is very high compared with the national percentage (12%). Off-highway vehicles produce 23 percent of NO_x regionally, compared with 22 percent nationally. Electric utilities represented 18 percent regionally, compared with 23 percent nationally. Petroleum and related NO_x, at 2 percent, is twice the national rate (1%), and probably reflects concentration of the petroleum industry in the region. Total NO_x produced in Region 6 was 4.2 million tons in 1999 (the third highest region).

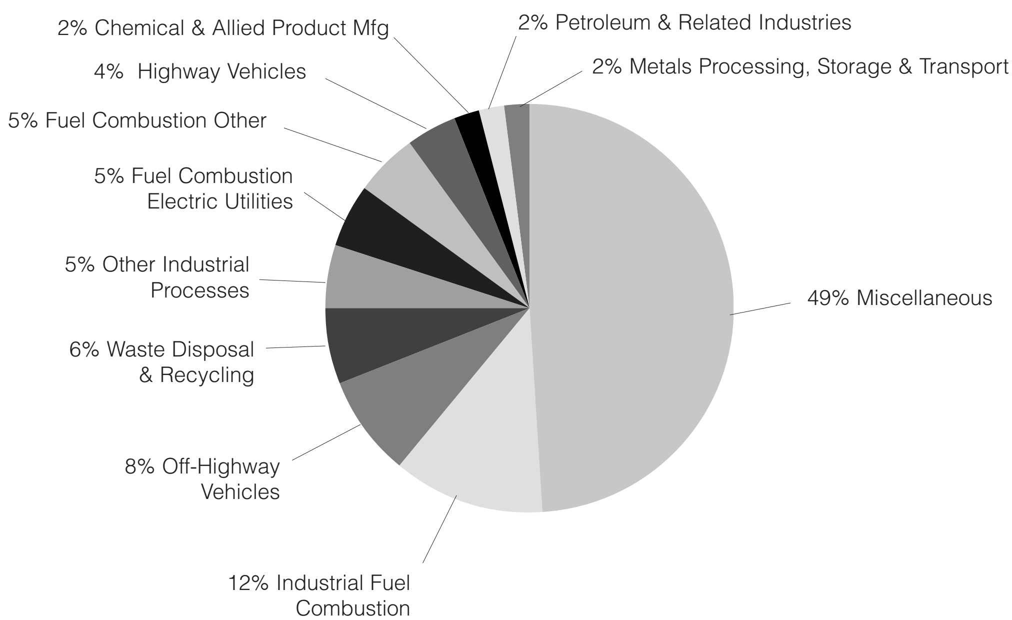
Sources of NO_x Emissions in Region 6- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

Agriculture and forestry, and other combustion were the major sources of particle pollution in Region 6 (49%), only 2 percent above the national average for miscellaneous sources of particle pollution. Industrial fuel combustion (12%) was the second largest source of particle pollution emissions in the region. Other major sources of particle pollution in the region include off-highway vehicles (8%), and waste disposal and recycling (6%). Other fuel combustion, other industrial processes, and fuel combustion from electric utilities each contributed 5 percent of particle pollution in the region. Region 6 reported 571,036 short tons of particle pollution during the 1999 inventory.

Particulate Matter in Region 6



Trends

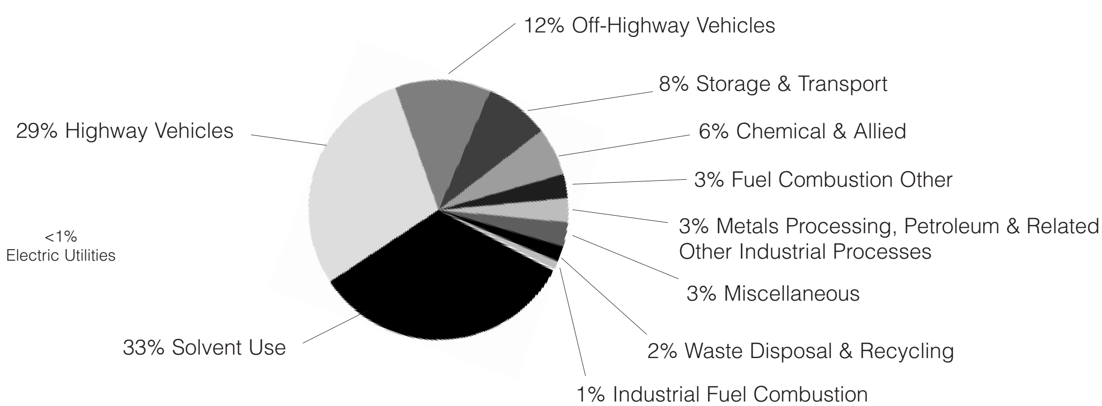
Monitored ozone levels dropped by 11 percent between 1983 and 2002, a trend slightly behind the nation as a whole, which dropped 14 percent during the same period. Furthermore, the long-term decline could have been greater had not the region's ozone levels increased by 8.9 percent from 1991-2000. Comparable trend data are not available for $PM_{2.5}$ levels.

Region 7: Iowa, Kansas, Missouri and Nebraska

Local sources of VOCs

Human activity generated 979,660 tons of VOCs in Region 7 in 1999, the third lowest amount in any region. It is unusual that the largest sources are solvents at 33 percent, higher than the national rate of 27 percent, which may reflect the greater rural nature of large parts of the region. Highway vehicles generate the second highest amount of VOCs, which at 29 percent is the same as the nationwide rate. Off-highway vehicles generate 12 percent of VOCs regionally, which is one-third lower than the national rate of 18 percent. VOCs from chemical and allied industries are also three times higher in this region than nationally (6% v 2%).

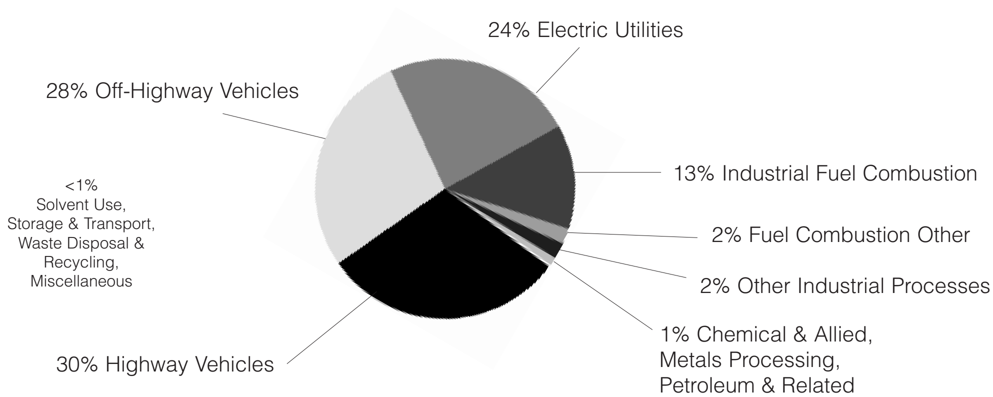
Sources of VOC Emissions in Region 7- 1999
Anthropogenic Sources Only



Local sources of NO_x

Highway vehicles, at 30 percent, are the largest source of NO_x emissions in this region — but they account for less in Region 7 than nationally (33%). NO_x from off-highway vehicles is significantly higher here than nationwide (28% v 22%). Electric utilities produce about one-fourth of NO_x here, about the same as nationwide (24% v 23%). Industrial fuel combustion is about the same, though other fuel combustion is less than half the percentage nationwide. Total NO_x in 1999 in Region 7 was 1.6 million tons.

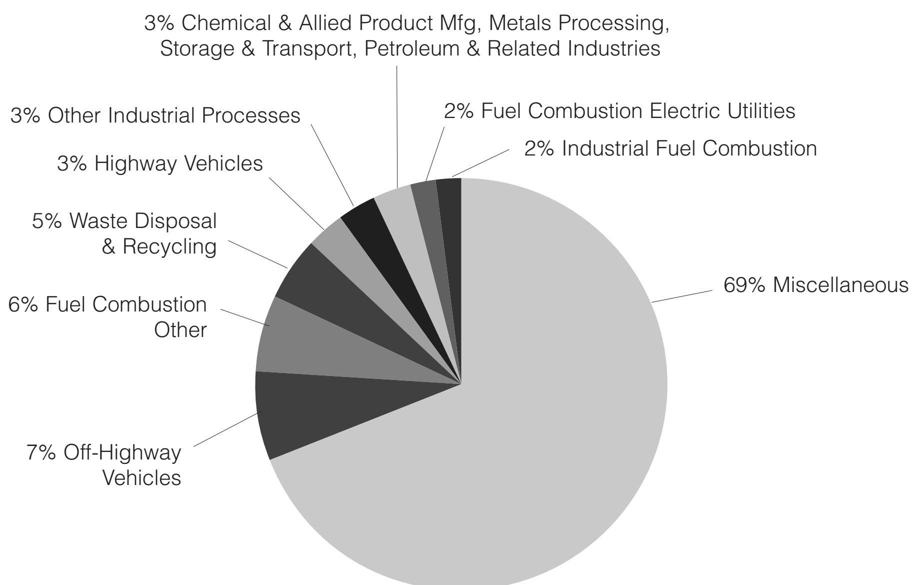
Sources of NO_x Emissions in Region 7- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

Agriculture and forestry, and other combustion were the major sources of particle pollution in Region 7 (69%); well above the national average of 47 percent for miscellaneous sources of particle pollution. Off-highway vehicles are the second largest source of particle pollution emissions at 7 percent. Other fuel combustion was the third largest source of particle pollution emissions at 6 percent, waste disposal and recycling followed at 5 percent. Region 7 measured 388,757 short tons of particle pollution during the 1999 inventory.

Particulate Matter in Region 7



Trends

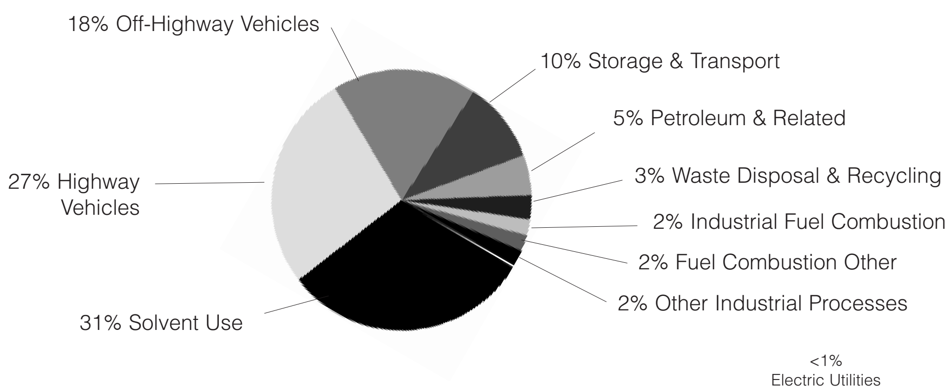
Monitored ozone levels dropped by 4 percent between 1983 and 2002, far behind the nation as a whole, which dropped 14 percent during the same period. Furthermore, the long-term decline could have been greater had not the region's ozone levels gone up by 2.7 percent from 1991-2000, the 3rd worst increase in any region during that decade. Comparable trend data are not available for $PM_{2.5}$ levels.

Region 8: Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming

Local Sources of VOCs

The largest human-generated source of VOCs in Region 8 is solvent use, at 31 percent, higher than the nation as a whole. Highway vehicles contribute just over one-fourth at 27 percent, lower than the 29 percent produced nationally. Off-highway vehicle use, the third largest source, is 18 percent, the same as the national rate. In 1999, Region 8 produced 778,485 tons of VOCs, the second lowest of all the regions.

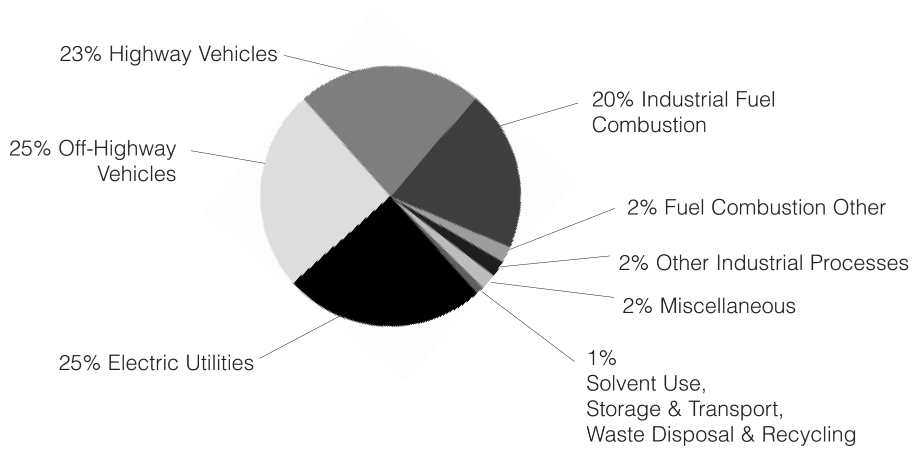
Sources of VOC Emissions in Region 8- 1999
Anthropogenic Sources Only



Local Sources of NO_x

The largest sources of NO_x emissions in Region 8 were electric utilities and off-highway vehicles, which each generated one-fourth of the total of 1.5 million tons in 1999. Nearly another fourth came from highway vehicles (23%). While the electric utility and off-highway contributions are higher than the nation as a whole, the highway vehicle contribution is lower by ten percent (23% v 33%). Industrial fuel combustion in the region makes up a much larger proportion at 20 percent than it does nationwide (12%). Other industrial sources are less of a factor than in the nation as a whole (2% v 4%).

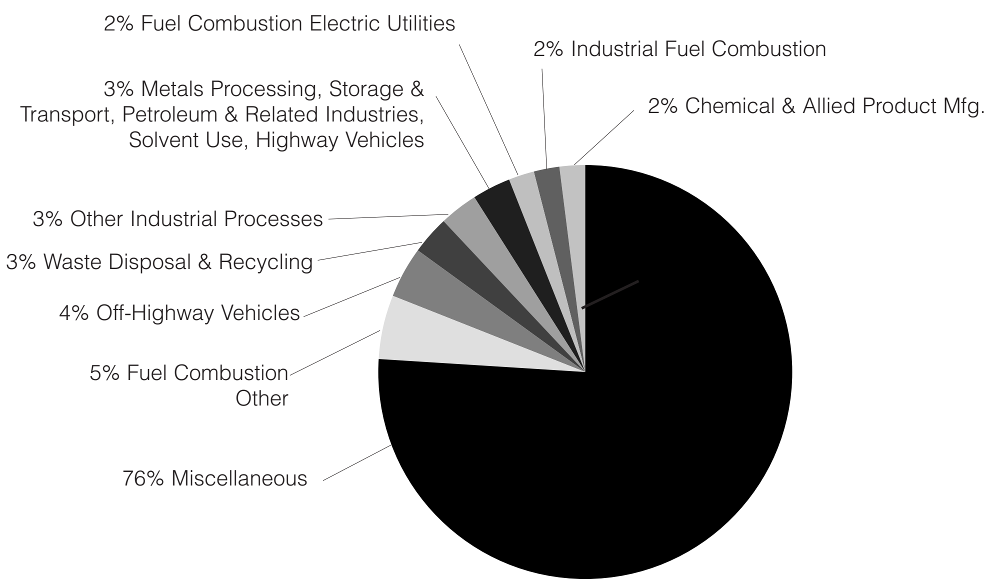
Sources of NO_x Emissions in Region 8- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

Seventy-six percent of particle pollution in Region 8 can be attributed to agriculture and forestry and other combustion; Region 8 exceeds the nationwide average for miscellaneous sources of particle pollution by 29 percent. Other fuel combustion from residential woodstoves and fireplaces contributed the second highest source of particle pollution emissions at 5 percent. Other emissions sources include: off-highway vehicles (4%), waste disposal and recycling (3%), other industrial processes (3%), chemical and allied product manufacturing (2%), fuel combustion from electric utilities (2%), industrial fuel combustion (2%). Metals processing, storage and transport, petroleum and related industries, solvent use, and highway vehicles contributed a combined total of 3 percent for particle pollution emissions in Region 8. Region 8 reported 507,054 short tons of particle pollution in 1999.

Particulate Matter in Region 8



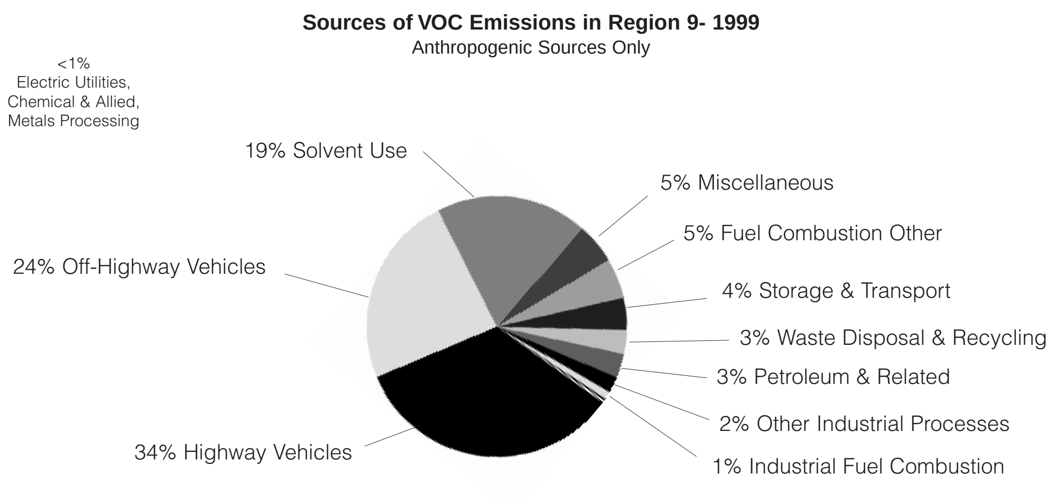
Trends

Monitored ozone levels dropped by 10 percent between 1983 and 2002, a trend slower than the nation as a whole, which dropped 14 percent during the same period. Furthermore, the long-term decline could have been greater had not the region's ozone levels risen by 3 percent between 1991 and 2000. Comparable trend data are not available for $PM_{2.5}$ levels.

Region 9: Arizona, California, Hawaii and Nevada

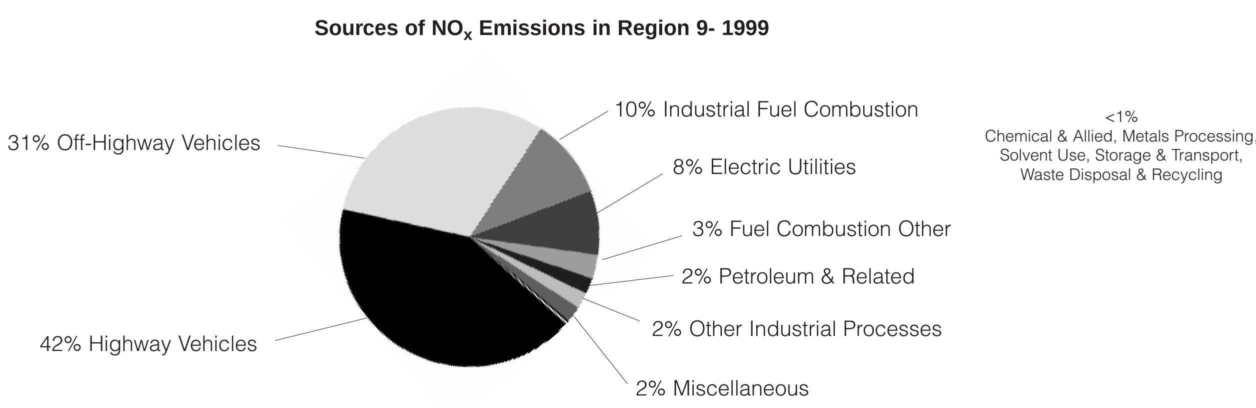
Local Sources of VOCs

The largest source of VOCs generated by human activity was highway vehicles, at 34 percent, compared with the national rate of 29 percent. Off-highway vehicles generated 24 percent of VOCs regionally, compared with 18 percent nationally. Solvents generated less than the national rate (19% v 27%). Other fuel combustion sources generated about the same regionally and nationally (5%). Storage and transport generated much less VOCs regionally compared with the national rate (4% v 7%). Total VOCs emitted in 1999 in Region 9 was 1.51 million tons.



Local Sources of NO_x

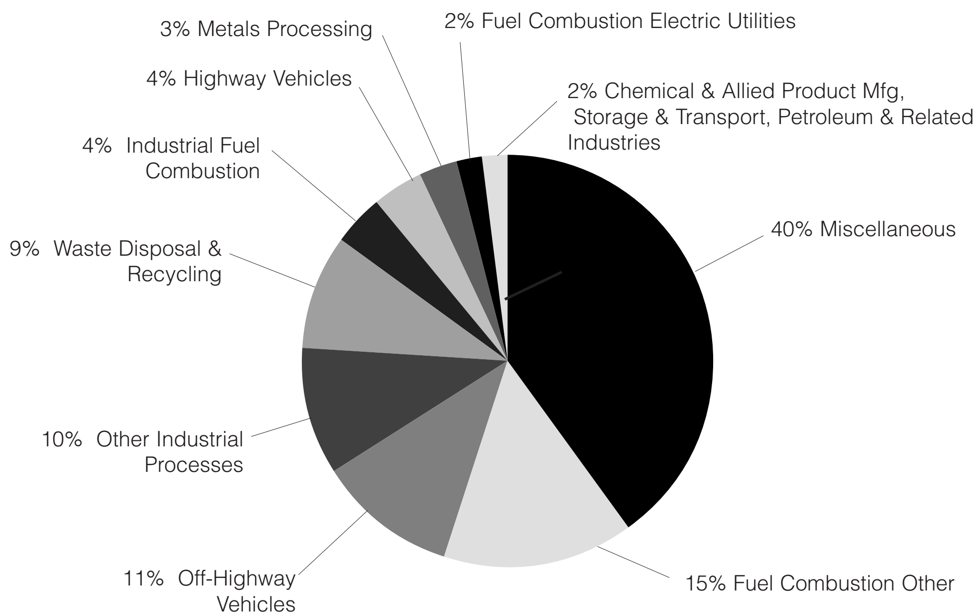
Highway vehicles generate a much greater percentage of NO_x in Region 9, 42 percent versus 33 percent nationally. This is not surprising, given the highway presence in California. NO_x generated off-highway is greater in Region 9 than nationwide (31% v 22%). By contrast, electric utilities are much less of a source of NO_x in the region (8% v 23%.) Industrial fuel combustion is slightly less regionally (10% v 12% nationwide). NO_x emissions in Region 9 totaled 2.25 million tons in 1999, the fourth highest in the nation. Two-thirds of the NO_x in Region 9 is produced in California.



Local sources of Particle Pollution ($PM_{2.5}$)

Region 9 produced 445,590 short tons of particle pollution in 1999, as reported in its inventory. Lower than the national average of 47 percent, miscellaneous sources of particle pollution from other combustion and agriculture and forestry contributed 40 percent of the particle pollution emissions in this region. Other fuel combustion from activities such as residential wood burning comprised the second largest source of particle pollution at 15 percent. Other major sources of particle pollution include off-highway vehicles (11%), other industrial processes (10%), and waste disposal and recycling (9%).

Particulate Matter in Region 9



Trends

California has historically led the way in reducing ozone levels in the nation. Their success is reflected in the steep decline in Region 9's ozone levels from 1983 to 2002, when the monitored levels dropped by 29 percent, the greatest reduction in any region of the nation and over twice the national rate (14%). Furthermore, between 1991 and 2000 when 3 of the 10 regions increased ozone levels, this region had the third highest rate of decline, reducing ozone levels by 14.4 percent in that decade.

Growth and dependence on the car will continue to challenge the region in reaching clean air. In California, for example, the population grew by 39 percent between 1981 and 2000. That growth was far outstripped by increased driving: the average daily number of vehicle miles traveled grew by 91 percent in that same period.[17]

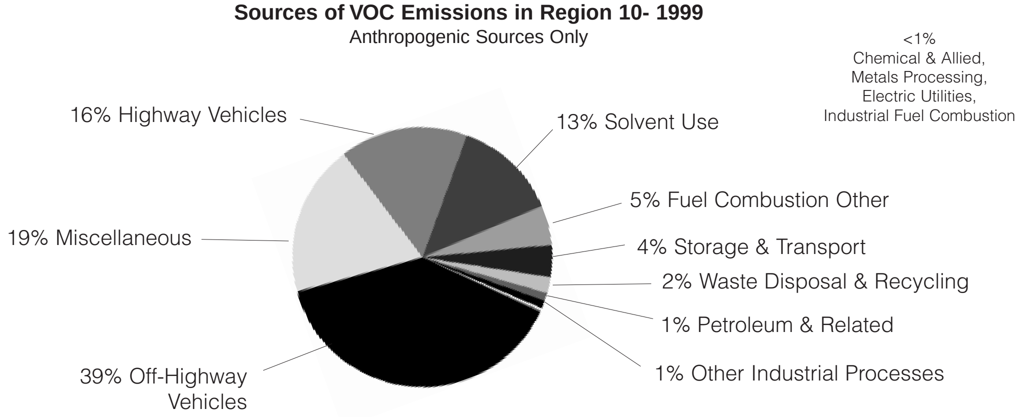
Comparable trend data are not available for $PM_{2.5}$ levels.

Region 10: Alaska, Idaho, Oregon, and Washington

Local Sources of VOCs

In this section of the country, off-highway vehicles dominate the VOC sources from all human activity, contributing nearly two-fifths (39%) of the total. By contrast, the nation's off-highway section is less than half that at 18 percent. Highway vehicles represent only 16 percent, about half the national rate of 29 percent. Solvent use also contributes less than half the rate seen nationally, at 13 percent versus 27 percent. Other VOC sources are more similar to the national rates, though storage and transport sources are about half (4% v 7%) of the nationwide rate. Region 10 produced 1.3 million tons of VOCs in 1999.

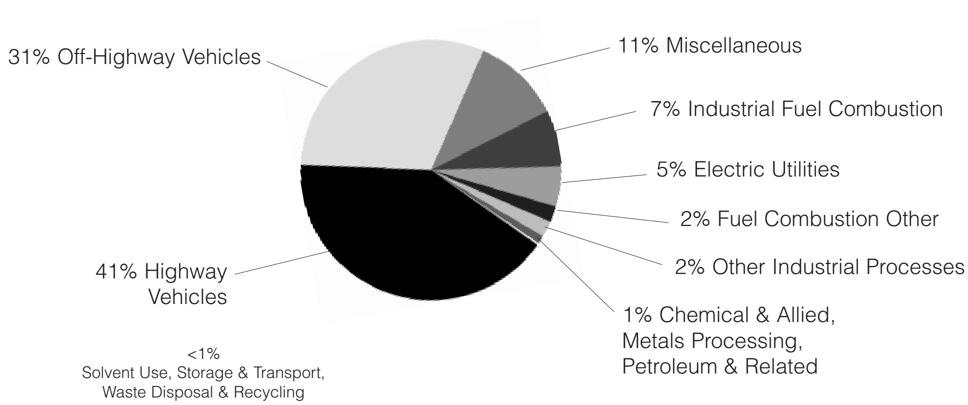
Sources of VOC Emissions in Region 10- 1999
Anthropogenic Sources Only



Local Sources of NO_x

Highway vehicles contribute the largest amount of NO_x in the region — 41 percent of the 892,073 tons generated in 1999. This is the second lowest NO_x total of all regions in the nation. The percentage of highway vehicle NO_x emissions in Region 10 is higher than it is in the nation as a whole, where it makes up 33 percent of emissions. Off-highway vehicles contribute 31 percent of NO_x, higher than the national rate of 22 percent. Electric utilities emit only 5 percent of total NO_x in this region, compared with 23 percent nationwide. Miscellaneous sources are an unusually high percentage at 11 percent. Industrial fuel combustion is only 7 percent compared with 12 percent nationally. Industrial emissions that are not fuel combustion account for 3 percent, slightly less than the national rate of 5 percent.

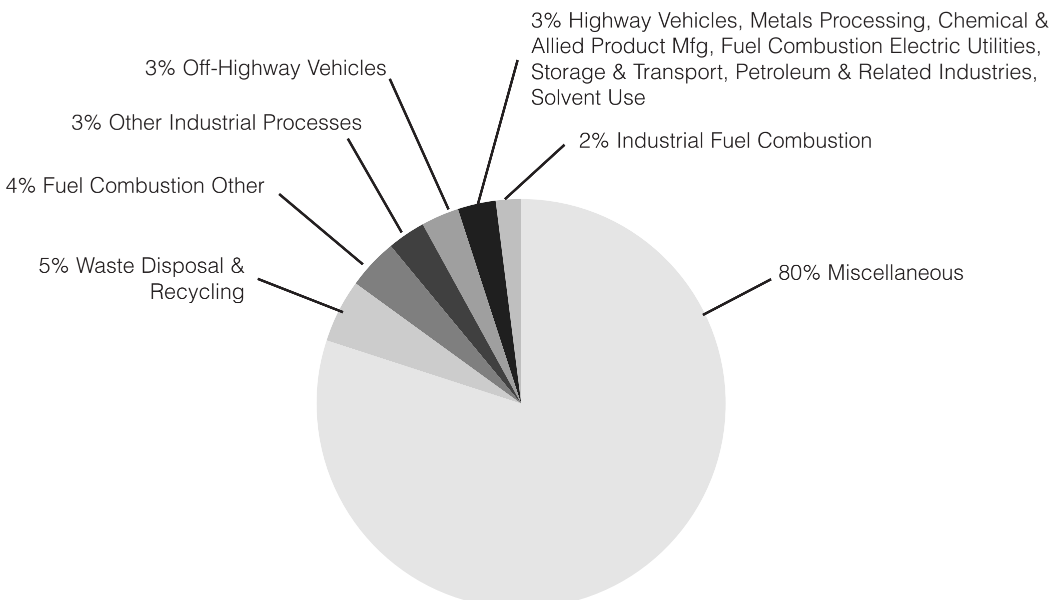
Sources of NO_X Emissions in Region 10- 1999



Local sources of Particle Pollution ($PM_{2.5}$)

Eighty percent of particle pollution emissions in Region 10 can be attributed to agriculture and forestry and other combustion; this figure exceeds the national average for miscellaneous particle pollution emissions by 33 percent. Waste disposal and recycling was the second largest source of particle pollution at 5 percent; other sources of particle pollution in the region include other fuel combustion (4%), other industrial processes (3%), industrial fuel combustion (2%), and off-highway vehicles (3%). Highway vehicles, metals processing, chemical and allied product manufacturing, fuel combustion from electric utilities, storage and transport, petroleum and related industries, and solvent use contribute a combined total of 3% of the particle pollution emission sources for Region 10. Region 10 produced 536,476 short tons of particle pollution according to its 1999 inventory.

Particulate Matter in Region 10



Trends

Ozone monitors show a surprising 2 percent increase in ozone readings in Region 10, the lone up-tick among the 10 regions in the nation during the period 1983-2002. During the same period the nation declined by 14 percent. However, between 1991 and 2000, the northwest and Alaska reported a decline of 8 percent. Comparable trend data are not available for $PM_{2.5}$ levels.

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[1] Considerable debate exists over which sources are truly generated by human activities and which are not. The available inventory database did not allow finer discernment of those sources within larger categories. Therefore, the miscellaneous category contains some sources that some might label natural in origin, rather than the product of human action. However, the large categories of fugitive dust and VOCs from vegetation are excluded.
[2] EPA. National Air Quality and Emissions Trends Report, 2003 Special Studies Edition. Washington, DC.: U.S. Government Printing Office; 2003. EPA Publication No. 454/R-03-005. http://www.epa.gov/oar/aqtrnd03/.
[3] EPA Trends Report 2003.
[4] EPA Trends Report 2003. Table A-13: National Air Quality Trends Statistics by EPA Region 1991-2000.
[5] EPA Trends Report 2003.
[6] US EPA, Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transportation of Ozone, 40 CFR Parts 51, 72, 75 and 96.
[7] EPA. Section 126 Rule: Revised Deadlines. 2002. 40 CFR 97 63:21522-30.
[8] Notes from the New Brunswick Lung Association, 2003. One of the groups working to reduce cross border ozone transport, is the Lung Associations' International Centre for Air Quality and Human Health created by the American Lung Association of Maine and the New Brunswick (Canada) Lung Association. The Centre promotes actions to reduce emissions and improve air quality for the people in the six New England states and in five eastern Canadian provinces. Actions high in the Centre's priorities are assessing the region's air quality and health impacts, facilitating research and educating the public.
[9] Correspondence from Kevin Stewart, American Lung Association of Pennsylvania, February 5, 2003.
[10] Communication from the American Lung Association of California, January 2003.
[11] EPA, National Environmental Trends Database, 1999 data.
[12] Office of Highway Policy Information, Federal Highway Administration, *Highway Statistics 2001*.
[13] EPA, National Emissions Trends database, 1999 data,. http://www.epa.gov/air/data/index.html.
[14] All data on sources of VOCs, NO_x , and $PM_{2.5}$ by region are from the EPA, National Emissions Trends database, 1999 data.
[15] All data on 1983-2002 trend analysis are from EPA Trends Report 2003.
[16] All discussion of trends in ozone is from the same source, EPA Trends Report 2003. Table A-13: National Air Quality Trends Statistics by EPA Region 1991-2000.
[17] California Air Resources Board. Air Quality Almanac, 2002.

Celebrating its 100th anniversary, the American Lung Association works to prevent lung disease and promote lung health. Lung diseases and breathing problems are the leading causes of infant deaths in the United States today, and asthma is the leading serious chronic childhood illness. Smoking remains the nation's leading preventable cause of death. Lung disease death rates continue to increase while other leading causes of death have declined.

The American Lung Association has long funded vital research on the causes of and treatments for lung disease. It is the foremost defender of the Clean Air Act and laws that protect citizens from secondhand smoke. The Lung Association teaches children the dangers of tobacco use and helps teenage and adult smokers overcome addiction. It educates children and adults living with lung diseases on managing their condition. With the generous support of the public, the American Lung Association is "Improving life, one breath at a time."

For more information about the American Lung Association or to support the work it does, call ***1-800-LUNG-USA*** *(1-800-586-4872) or log on to* ***www.lungusa.org****.*

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