Air Quality Trends in Urban Low-Income Areas

Summary of Analysis by
Alpine Geophysics, LLC
April 2014

Overview

Alpine Geophysics, LLC, examined air quality trends from 1999 to 2012 in a geographically diverse group of low-income urban areas. Their report assesses the extent of air quality improvements for two key health-related pollutants regulated by the Clean Air Act: ozone (urban smog) and fine particulate matter (PM2.5). The air quality monitor data for the study were obtained from U.S. EPA. The study also analyzes the emission sources contributing to ozone concentrations in these areas in 2010.

The air quality measurement data reported in the Alpine study are 8-hour ozone design values (average of the 4th highest ozone concentration over a three-year period) and three-year rolling PM2.5 design values based on data from U.S. EPA. Alpine analyzed these trends for the 1999-2012 period with "least squares" regression techniques. The report presents results of 2010 ozone source-apportionment modeling using CAMx, an EPA-approved air quality model that measures ozone concentrations contributed by various source categories (e.g., power plants, motor vehicles, other industrial sources, etc.)

Summary of Findings

Air quality trend data were analyzed for 13 monitors in eight eastern states, located in urban areas. The median household incomes of the areas surrounding the monitors averaged $32,000 in 2012, one-third below the national median income of $51,000. Monitors in low-income urban areas were selected due to claims that economically-disadvantaged populations are subject to disproportionately high levels of air pollution. The monitors included in the study were not pre-screened for characteristics other than median household income.

The least-squares trend analyses of 8-hour ozone and PM2.5 design values at these 13 monitors reveal a consistent pattern of air quality improvement for both pollutants over the 1999-2012 period.

Alpine's CAMx modeling of the sources of urban smog indicate that mobile source emissions (onroad and offroad) are the largest cause of manmade pollution at all monitors analyzed based on 2010 data (33% to 50%). Among source categories, emissions from all electric generation (coal, oil and natural gas) contributed 5% to 13% of urban smog at the monitors analyzed.

Copies of the complete Alpine Geophysics report are available at:

http://midwestozonegroup.com/AirTrendsJuly2013Public.html

Highlights of Alpine Geophysics/ENVIRON Emissions Trends Reports,1999-2011 (With a 2008-2013 Ozone Season Update)

Presentation for
Ozone Transport Commission
Baltimore, MD
June 11, 2014

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Attorney at Law
Chair, Midwest Ozone Group Gov't Relations Comm.

Data sources

- Alpine Geophysics/ENVIRON 2013 Emissions and Air Quality Trends reports, available for 48 states and 5 regions.
- U.S. EPA principal data source.
- State and regional reports are downloadable from:

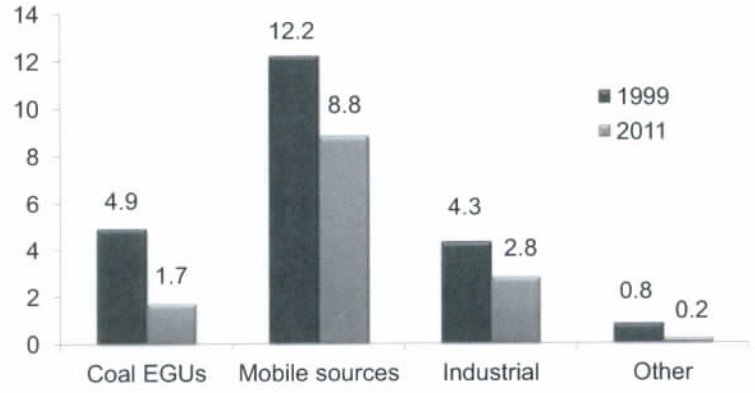
  www.americaspower.org and

  www.midwestozonegroup.com

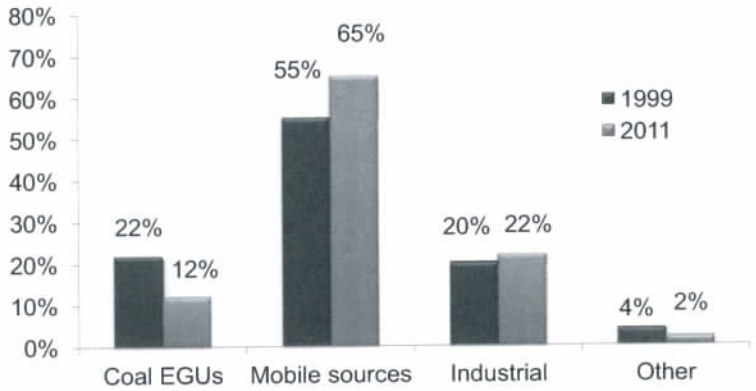
Condensed Emission Categories

- Coal-based Electric Generating Units (EGUs)
- Mobile sources (onroad and offroad)
- Industrial (fuel combustion and processes)
- All other

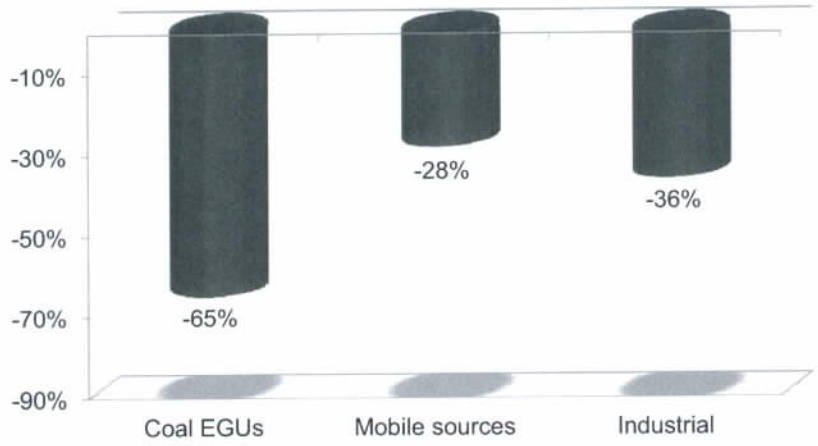
Total U.S. NOx Emissions (In millions of tons/yr.)



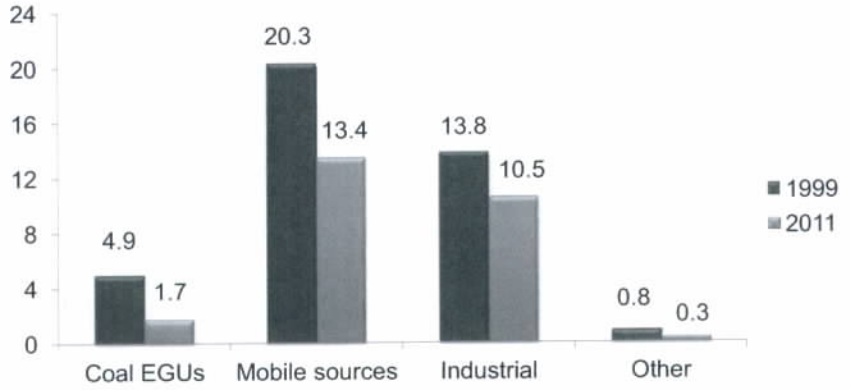
Share of U.S. NOx Emissions by Source Category, 1999-2011



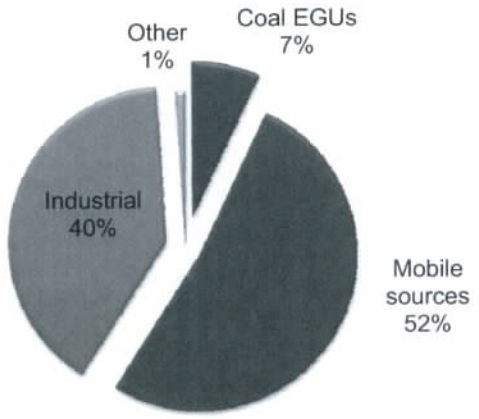
Percent Change in U.S. NOx Emissions, Major Source Categories, 1999-2011



U.S. NOx and VOC Emissions (Total manmade ozone precursor emissions) (In millions of tons/yr.)

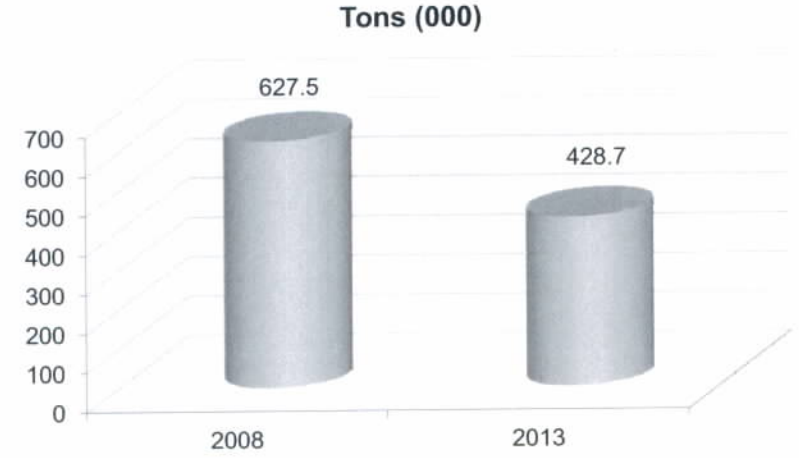


Percent Share of U.S. Ozone Precursor Emissions by Source Category, 2011



Note: Includes manmade NOx and Volatile Organic Compounds (VOCs).

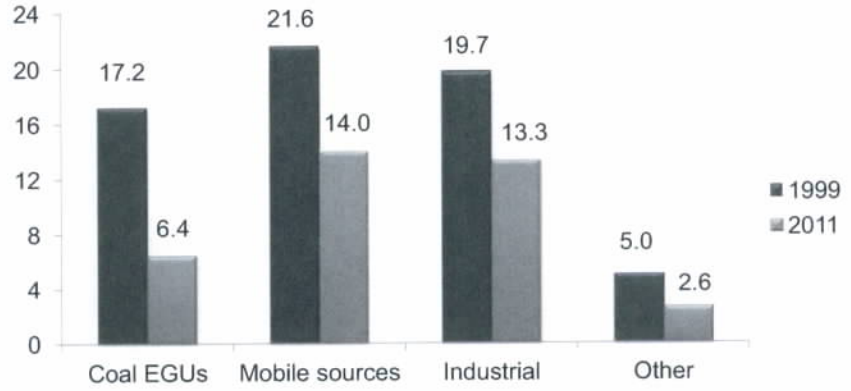
Coal EGU CAIR Region Ozone Season NOx Emissions Have Declined by 32% since 2008



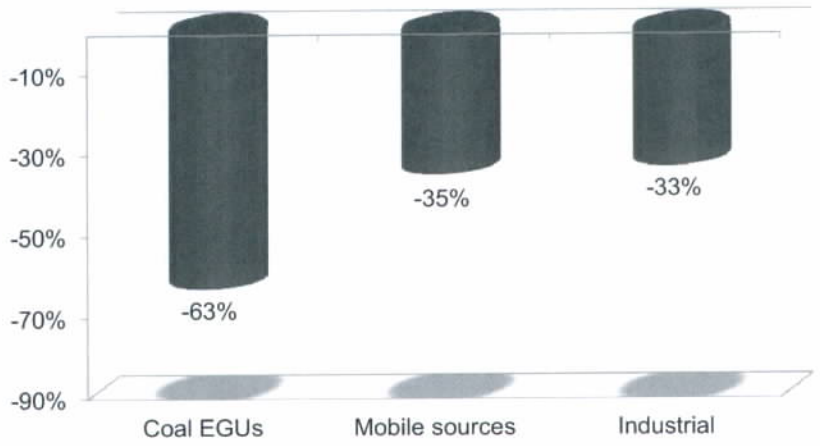
Source: US EPA CAMD CAIROS Data Query as of June 5, 2014.

U.S. SO2, NOx, VOC and Direct PM2.5 Emissions

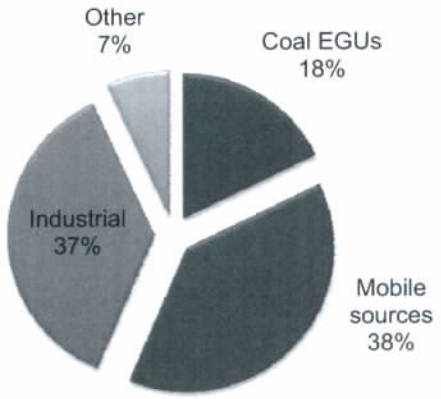
(Manmade fine particulate precursor emissions)
(In millions of tons/yr.)



Percent Change in U.S. Fine Particulate Precursor Emissions, Major Source Categories, 1999-2011



Percent Share of U.S. Fine Particulate Precursor Emissions by Source Category, 2011



Note: Includes manmade SO2, NOx, VOC and direct PM2.5 emissions.