U.S. DEPARTMENT OF ENERGY'S STUDIES OF WEEKDAY/WEEKEND POLLUTION IN SOUTHERN CALIFORNIA

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Over the past 3-year period, the U.S. Department of Energy (DOE) and others have sponsored a series of coordinated studies to investigate the relationships between emissions of hydrocarbons and nitrogen oxides on ambient ozone and particulate nitrate levels. This presentation will summarize those studies and discuss DOE's future projects in increasing our fundamental understanding of the connection between emissions and ambient air quality.

Ambient ozone concentrations in California's South Coast Air Basin (SoCAB) can be as much as 55 percent higher on weekends than they are on weekdays under comparable meteorological conditions. This is paradoxical because emissions of ozone precursors (hydrocarbons, carbon monoxide, and nitrogen oxides) are lower on weekends relative to weekdays. Day-of-week emissions activity data were collected and analyzed to investigate the hypothesized causes of the "weekend ozone effect." Emissions activity data were collected for various mobile, area, and point sources throughout the SoCAB, including on-road vehicles, lawn and garden equipment, barbecues, fireplaces, solvent use, and point sources with continuous emissions monitoring (CEM) data.

Survey results indicate that significant differences exist between weekday and weekend emissions activity patterns and emissions. The combined effect of these differences resulted in a 12-18 percent decrease in reactive organic gases (ROG) and a 35-41 percent decrease in NO_x emissions on Saturdays and Sundays, respectively, relative to weekdays, in the summer of 2000. These changes in emissions resulted in an increase of the ROG to NO_x ratio of more than 30 percent on weekends compared to weekdays, which, along with lower NO_x emissions, increases ozone production on weekends relative to weekdays.