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Backgrounder 1

Clean-Air Benefits

California's cleaner-burning gasoline is one of the most significant pollution-reduction measures ever undertaken in California. By reducing harmful emissions from California's 24 million motor vehicles as well as the wide array of gasoline-burning equipment, cleaner-burning gasoline will play a lead role in reducing health effects from air pollution and enabling California to attain federal and state air-quality standards.

This backgrounder presents an overview of the benefits that cleaner-burning gasoline will provide to California.

Background

Despite decades of progress in reducing air pollution, California continues to have the worst air quality in the nation.

California has been a world leader in requiring stringent emission controls on motor vehicles and industrial plants. These and other pollution-control measures have made a difference — the average Californian's exposure to harmful levels of ozone, the primary component of smog, has been cut in half since 1980.

Despite this progress, five of the seven cities in the United States with the worst air-quality problems are in California, and 90 percent of Californians still breathe polluted air.

California's sunny climate and mountainous topography are well-suited for smog formation. Volatile organic compounds, oxides of nitrogen and other common pollutants are converted by sunlight into ozone, a colorless, odorless gas that can damage lung tissue. Ozone aggravates common respiratory ailments, such as asthma and bronchitis, and contributes to premature aging of lung tissue and various chronic lung diseases.

Hot weather accelerates ozone formation, and frequent air inversions trap ozone-laden air in the coastal plains and inland valleys where most of California's cities are located.

The greater Los Angeles area has the highest ozone levels in the United States, but Ventura County, San Diego, the San Joaquin Valley and Sacramento also have very serious ozone problems. Ozone levels are lower but still reach unhealthy



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levels in the San Francisco Bay Area and many mountain and desert counties. Only a handful of rural counties in the northernmost part of the state are in attainment with federal and state ozone standards.

Motor vehicles account for about 50 percent of ozone-forming emissions. Emission-control devices and the Smog Check program have helped reduce motor vehicle emissions, but Californians will not be able to breathe clean, healthy air unless further steps are taken to reduce motor vehicle emissions.

The Benefits of Cleaner-Burning Gasoline

Cleaner-burning gasoline is a powerful and effective clean-air measure because it will immediately reduce emissions from all the motor vehicles and motorized equipment that use it. Virtually every motor vehicle, regardless of its age or the sophistication of its emission-control equipment, will pollute less when it begins using cleaner-burning gasoline.

The reductions in ozone-forming emissions from the use of cleaner-burning gasoline will account for approximately 25 percent of the total ozone reductions expected from all new pollution-control measures to be implemented in California in the next several years. No other single pollution-control measure comes close to that amount.

The emissions reductions from use of cleaner-burning gasoline will be equivalent to taking approximately 3.5 million motor vehicles from California's roads and highways. More specifically, the clean-air benefits are comparable to removing the following number of motor vehicles from these geographic areas:

Area	Motor Vehicles Removed
South Coast/Greater L.A.	1,500,000
Ventura County	80,000
San Diego County	325,000
Desert Counties	130,000
San Joaquin Valley	350,000
Sacramento Valley	260,000
S.F. Bay Area	575,000
Rest of State	300,000
Total for California	3,520,000

Total Emission Reductions

The use of cleaner-burning gasoline will reduce the emission of pollutants from on-road motor vehicles in California by more than 3 million pounds per day. This includes reductions in emissions of carbon monoxide of about 2.6 million pounds per day.

While the carbon monoxide reduction is an important benefit, the California Air

Resources Board views the most important benefit to be the reduction of an estimated 600,000 pounds per day of volatile organic compounds (VOCs) and oxides of nitrogen (NO_x), which combine in the atmosphere to form ozone. This amounts to an approximate 15 percent reduction in these pollutants from motor vehicles.

Cleaner-burning gasoline also will reduce emissions of toxic substances, principally benzene (a known human carcinogen). These toxic substances are emitted into the air both from motor vehicle operations and during refueling. Cleaner-burning gasoline will reduce human cancer risk related to gasoline exposure by 30 to 40 percent.

Pollutant	Total Reduction (tons/day)	Reduction (%)
Volatile Organic Compounds	190	17
Oxides of Nitrogen	110	11
Carbon monoxide	1300	11
Sulfur dioxide	30	80

Ozone Is Invisible—But Benefits Will Be Real

Because ozone is a colorless, odorless gas, the improvement in air quality expected from cleaner-burning gasoline may not necessarily be discernible to the eye. The “dirty air” associated with smog episodes often is due to haze, particulates and other factors not related to ozone. It is possible for ozone levels to decrease (and air quality to improve) even on days when visibility is poor.

Even though cleaner-burning gasoline is an important clean-air measure, it will not single-handedly eliminate California’s ozone problem. On any given day, a combination of high temperatures, sunshine, stagnant air and pollution can cause high ozone levels. However, cleaner-burning gasoline will contribute to a significant reduction of ozone levels throughout California.

With the help of cleaner-burning gasoline, there will be fewer high-ozone days when health authorities recommend that people restrict strenuous outdoor activities and that children and the elderly remain indoors. And by lowering average ozone levels throughout the year, cleaner-burning gasoline will reduce a significant long-term threat to the health of Californians for years to come.

Cleaner-Burning Gasoline Aids Automotive Engineers

Automotive engineers already are taking advantage of cleaner-burning gasoline and alternative fuels in designing low-emission and ultra-low emission vehicles that will emit 70 percent fewer smog-forming pollutants than 1990 vehicles and 99 percent fewer pollutants than a typical early-1970s vehicle.

These “clean cars” will be available for sale by the end of the decade and will also play an important role in reducing air pollution. They represent a marriage between new, low-emission automotive technologies and the emerging family of clean fuels, including cleaner-burning gasoline.

Comparison with Federal Gasoline in Southern California

Since January 1995, service stations in most of Southern California and a number of metropolitan areas in other states have had to sell gasoline that has been reformulated to specifications set by the U.S. Environmental Protection Agency. This “U.S. EPA” reformulated gasoline is cleaner than conventional gasoline but not as clean as California’s cleaner-burning gasoline.

Use of the U.S. EPA gasoline reduces ozone-forming emissions from motor vehicles by about 7 percent. This amounts to roughly half the clean-air benefits of California’s cleaner-burning gasoline. Metropolitan areas outside California that are using the federal gasoline will switch to an even cleaner “Phase 2” U.S. EPA gasoline in 2000. But even this Phase 2 gasoline offers only about two-thirds of the clean-air benefits of California’s cleaner-burning gasoline.

Southern California service stations will switch to California’s cleaner-burning gasoline at the same time as the rest of the state.

Discontinuation of Wintertime Fuel Program

High levels of carbon monoxide tend to be a problem in the winter. Since November 1992, California has required gasoline sold in winter months to contain oxygenates to reduce carbon monoxide emissions.

Cleaner-burning gasoline contains similar levels of oxygenates to reduce carbon monoxide and enable the fuel to burn more completely. There will no longer be a need for a special wintertime fuel program because cleaner-burning gasoline will reduce carbon monoxide emissions throughout the year.

Cleaner-Burning Gasoline Benefits Rural Areas

Air pollution is often perceived as an urban problem that does not affect rural areas. This is untrue. Rural counties in the Sacramento Valley, the Sierra Nevada foothills and desert areas experience ozone levels that violate state standards. These ozone levels damage crops, plants and trees, in addition to posing a health threat. Cleaner-burning gasoline will help bring about needed ozone reductions in these areas.

Cleaner-burning gasoline also offers benefits to those relatively few areas of the state that have attained federal and state ozone standards. By reducing motor vehicle emissions, cleaner-burning gasoline improves the ability of those areas to protect local air quality while considering future options for economic development and population growth.