



## Project Summary

# Estimation of Emissions from Charcoal Lighter Fluid and Review of Alternatives

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**The report gives results of an evaluation of emissions of volatile organic compounds (VOCs) from charcoal lighter fluid, including both evaporative and combustion emissions.**

***This Project Summary was developed by EPA's Air and Energy Engineering Research Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).***

### VOC Emissions

Volatile organic compounds (VOC) are known to contribute to the formation of ozone; therefore, the ozone nonattainment issue has focused attention on VOCs emitted from many stationary, mobile, and area sources. One group of area sources which has received recent attention by the U. S. EPA and a number of state and local air pollution control agencies is a wide variety of VOCs containing consumer products. The focus of this study is to evaluate emissions of VOCs from charcoal lighter fluid, a consumer product consisting entirely of volatile constituents. An estimated 46,250 tons (42,000 Mg) of charcoal lighter fluid are used in the United States every year.

VOCs are emitted when charcoal lighter fluid is used, but these emissions are difficult to quantify. Evaporative VOC losses occur from the lighter fluid prior to ignition, and combustion VOC losses occur from burning lighter-fluid-soaked charcoal briquettes.

This study evaluates tests conducted to date on charcoal lighter fluid emissions. The information is most complete for the evaporative VOC losses. The estimates vary greatly, however, based on the length of time between application of the lighter fluid and ignition of the fire. The estimates of evaporative VOC losses range from 244 to 6,937 tons/yr (220 to 6,300 Mg/yr). The best estimate of VOC evaporative emissions is 1,110 tons VOC/yr (1,000 Mg/yr), and is derived from one of the tests evaluated in this study. This estimate, in the mid range of the estimates reviewed, is based on the assumption that a 5 minute soaking period is most representative of actual usage.

Approximately 14,500 tons VOC/yr (13,150 Mg/yr) are expected to be emitted from the combined evaporation and combustion of charcoal lighter fluid. The limited tests conducted to date have not distinguished the lighter fluid combustion emissions from the charcoal briquette combustion emissions.

This study also examines current usage patterns, ease of use, and costs to consumers for the alternatives to charcoal lighter fluid, and qualitatively ranks the emissions from the use of each alternative. In general, electric grills produce the lowest emissions, followed by liquified petroleum gas and natural gas grills. Chimney and electric starters produce charcoal combustion emissions only, and solid and gel starters should produce fewer emissions than self-starting charcoal or charcoal lighter fluid. Emissions from self-starting charcoal result from the combustion of the volatile component and the charcoal itself. The

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most popular outdoor cooking method, igniting charcoal with charcoal lighter fluid, produces the highest VOC emissions of the methods evaluated in this study.

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*The complete report, entitled "Estimation of Emissions from Charcoal Lighter Fluid And Review of Alternatives," (Order No. PB 90-186 313/AS; Cost: \$15.00 subject to change) will be available only from:*

*National Technical Information Service*

*5285 Port Royal Road*

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