

## **The Triple-Dare Challenge Facing the Automotive Industry: Fuel Economy Standards, Emissions Regulations, and Renewable Fuel Use**

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Reducing petroleum consumption and improving energy security are primary goals of the Department of Energy. In order to achieve these goals in a sustainable manner, air quality must not be sacrificed. Oak Ridge National Laboratory (ORNL) is enabling industry to introduce advanced fuel-efficient engine technologies to the marketplace by performing scientific research on the control of NO<sub>x</sub>, CO, hydrocarbon, and particulate emissions. The research spans from the nanoscale, where the reduction of harmful pollutants on catalytic sites occurs, to full-scale engine systems, where advanced analytical tools are employed to characterize the complex exhaust chemistry. The resulting technology advancements in catalytic emission control are enabling more fuel efficient vehicles and also helping reduce air pollution in the Knoxville and surrounding counties where ambient air quality is not in attainment of U.S. EPA standards. Current research is focused on helping industry meet three major challenges being implemented in the next decade: (1) new aggressive fuel economy standards (2) further reducing vehicle emissions to meet the new U.S. EPA Tier 3 emission standards, and (3) increasing renewable fuel use to meet goals of the Energy Independence and Security Act of 2007. This presentation will cover mobile source emissions and their impacts on air quality, emission regulations and challenges, basic catalyst science for emission control, and highlights from ORNL research studies on emission control from advanced vehicles.