# Fuels Utilization Program

## Driving the Nation Toward a Clean Energy Future

The transportation market in the United States is evolving. As the number of vehicles and miles traveled on American roadways continues to grow, the nation is looking toward advanced vehicles and fuels to meet the increasing demand for more energy efficient, environmentally friendly modes of transport. At the National Renewable Energy Laboratory, the Center for Transportation Technologies and Systems' Fuels Utilization Program is doing its part. We're developing and demonstrating engine and fuel technologies that allow alternative and advanced petroleum fuels to compete with their conventional counterparts.

The Fuels Utilization Program supports the U.S. Department of Energy's goals of reducing the nation's dependence on foreign oil, while improving personal mobility, commercial transport, air quality, and associated public health. Our diverse team of engineers, technicians, scientists, project managers, and communicators work in partnership with industry, research organizations, government agencies, and universities around the world to help these goals become a reality.

### Advanced Transportation Fuels Research and Development

We evaluate alternative and advanced fuels, lubricants, engines, emission control devices, and vehicles with the goal of cutting emissions while improving engine efficiency, durability, and performance. We examine compressed natural gas, ethanol, biodiesel, hydrogen, synthetic fuels, and advanced petroleum-based fuels such as low sulfur diesel. These fuels can be used in internal combustion engines and fuel cells.

New fuel formulations are evaluated to determine their properties and effects on engine operation and emissions. We employ system emissions reduction models for vehicles operating on different types of fuels.

### Advanced Technology Vehicle Development, Evaluation, and Deployment

Our heavy vehicles team works with industry and government agencies to move advanced vehicle technologies from concept to realization. We help develop competitive heavy-duty engine technologies that run on advanced and alternative fuels, foster their deployment, and objectively analyze their performance in fleets across the United States. These fleet tests contribute to the development and deployment of energy efficient, low-emission vehicles. We also lead the DOE effort to develop prototype natural gas vehicles that are technically and commercially competitive. These advanced vehicles will represent a significant step-change in natural gas vehicle technology.

Caterpillar, Inc./PIX 04147

*We work with manufacturers to assess the performance and emissions of their advanced and alternative fuel engines, like this heavy-duty natural gas engine that's undergoing in-laboratory testing.*

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Warren Gretz, NREL/PIX 05036

*We analyze the emissions from vehicles that run on traditional and advanced fuels.*


Warren Gretz, NREL/PIX 06091

*We evaluate the performance of alternative fuel vehicle fleets on the road today.*

## Environmental Science & Health Effects

The transportation sector is the dominant source of air pollution in the United States. In an effort to better understand the degree to which different types of vehicles and fuels contribute to the problem, we gather and examine outdoor air samples as well as in-laboratory emissions data from vehicles that run on gasoline, diesel, biodiesel, natural gas, and ethanol.

In a big-picture effort to understand how different types of vehicles fit into the emissions puzzle, we look at light-, medium-, and heavy-duty vehicles that run on traditional and advanced fuels. Through field studies we collect ambient samples and meteorology measurements, which in combination with emissions data are examined to determine the effect of different transportation fuels on air pollution. We coordinate our research with organizations conducting DOE-funded studies on the health effects of such pollutants; automobile and engine manufacturers; the petroleum industry; federal, regional, and local environmental agencies; and engine and fuel researchers.

## Technology Integration and Utilization

Developing advanced vehicle and fuel technologies is the first step. Moving new technologies into the marketplace is the next. Through several avenues, we develop and distribute unbiased information and technical resources necessary for government, industry, and the public to make informed decisions about using alternative and advanced transportation fuels and technologies.

We evaluate and document the performance of alternative fuel fleet vehicles and analyze real-world information that is vital to widespread alternative fuel use. We provide analysis and supporting infrastructure for implementation of regulations under the Energy Policy Act of 1992. In addition, we work with DOE's Clean Cities Program to help build the foundation for a sustainable alternative fuels market in cities across the nation.

We also provide access to a wide range of information on advanced transportation technologies and programs through a national clearinghouse. The Alternative Fuels Data Center can be accessed via the World Wide Web (http://www.afdc.doe.gov) or a toll-free hotline (800-423-1363).

### *For more information contact:*

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NREL/FS-540-29285