

CLEAN CITIES LEARNING PROGRAM FIRST RESPONDER SAFETY TRAINING OVERVIEW

The Clean Cities Learning Program First Responder Safety Training educates first responders on how to respond safely to a vehicle accident involving alternative fuel and advanced technology vehicles. This comprehensive information is organized into four separate modules to address the primary alternative fuel and advanced technology vehicles used on the road today.

Modules include:

- Biofuels and Biofuel Vehicles
- Gaseous Fuels and Gaseous Fuel Vehicles
- Hydrogen and Hydrogen-Powered Vehicles
- Electric Drive Vehicles

The Clean Cities Learning Program First Responder Safety Training also prepares first responders to deal with the media and respond appropriately and effectively to inquiries related to alternative fuel and advanced technology vehicle accidents.

The Clean Cities Learning Program First Responder Safety Training features useful reference materials, including a workshop booklet and a Quick Reference Guide intended for on-scene use. These materials, along with the comprehensive information presented during the training, provide first responders with the information and preparation necessary to properly respond to incidents and inquiries involving alternative fuel and advanced technology vehicles.



Biodiesel prices. Source: National Renewable Energy Laboratory (NREL) Photographic Information eXchange (PIX) #17190

INTRODUCTION TO: BIOFUELS AND BIOFUEL VEHICLES

The First Responder Safety Training Biofuels and Biofuel Vehicles module focuses on biodiesel and ethanol and the use of these fuels in diesel and gasoline vehicles, respectively. The Energy Information Administration (EIA) estimates that more than 450,000 flexible fuel vehicles (FFVs) are using an 85% ethanol blend mixed with gasoline (E85), and more than 324,329,000 gasoline gallon equivalents of biodiesel were used to fuel vehicles in 2008 alone.¹ Because biofuels can be blended into conventional fuel and used to operate conventional vehicles without significant alterations to the vehicle engine and components, these fuels have significant potential for continued increased use in the future.

Benefits. Biofuels and biofuel vehicles are beneficial in many ways.

- **Increases Energy Security.** The United States imports more than 60% of its petroleum. Biodiesel and ethanol can be produced domestically and used in conventional engines, directly reducing the use of imported petroleum. Furthermore, biofuels are renewable and can be produced from agricultural crops (e.g., corn, soy), promoting the growth of the U.S. agricultural sector.
- **Reduces Emissions.** Compared with using conventional fuels, biofuel vehicles produce lower amounts of harmful emissions.
 - B20 blends have been shown to decrease emissions of particulate matter, carbon monoxide, hydrocarbons, and carbon dioxide, as compared to diesel fuel.³
 - Using E85 in an FFV has been shown to decrease emissions, as compared to using gasoline in the same vehicle.⁴
- **Protects the Environment.** Biodiesel and ethanol are biodegradable and less threatening to surface water, ground water, and wildlife if released into the environment compared to petroleum fuels.



Vehicle identification. Source: NAFTC



Biofuel. Source: NAFTC

¹ U.S. Energy Information Administration, Alternatives to Traditional Transportation Fuels 2008.

² EIA, Annual U.S. Crude Oil Supply & Disposition, 2008.

³ U.S. Environmental Protection Agency, A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions, 2002.

⁴ Ecoengineering and National Renewable Energy Laboratory, Effect of E85 on Tailpipe Emissions from Light-Duty Vehicles, 2009.

Training Objective. The Biofuels and Biofuel Vehicles module will provide first responders with the information, tools, and resources necessary to prepare for and respond to incidents involving biofuel vehicles.

Training Components. The Biofuels and Biofuel Vehicles module will familiarize first responders with the key properties and characteristics of biodiesel and ethanol, as well as important safety considerations related to the use of biofuels in conventional diesel and gasoline vehicles, including modifications made to these vehicles to support biofuel use. The training will also include:

1. Review of safety equipment necessary to properly respond to an incident involving a biofuel vehicle.
2. Methods to identify biofuel vehicles at the scene of an accident.
3. Recommended practices for approaching and securing biofuel vehicles.
4. Vehicle extrication procedures specific to biofuel vehicles.
5. Specific information about how to effectively manage a biofuel vehicle fire, fuel spill, or leak.

After completing this training, first responders will have the knowledge and skills necessary to confidently and safely confront and handle accidents involving biofuel vehicles.



FFV badges and fuel tank markings. Source: NAFTC

BACKGROUND

Alternative fuel and advanced technology vehicles play a critical role in today's efforts to reduce U.S. dependence on petroleum, helping to secure our nation's energy resources through the use of domestic and renewable fuels and fuel-efficient technologies. Additionally, alternative fuel and advanced technology vehicles can assist in reducing harmful emissions, including greenhouse gases such as carbon dioxide (CO₂), both through the use of cleaner burning fuels as well as emissions reductions that result from decreased fuel use. Reduced dependence on petroleum is important to national security while improved air quality is tied directly to improved human health.

Many resources have been at work to bring the alternative fuel and advanced technology vehicles industry to the place it is today, and education and outreach are extremely important to its continued growth and success. A key element of this education and outreach is training for first responders. The number of alternative fuel and advanced technology vehicles on the road will only increase, and first responders must be properly informed about the ins and outs of the available fuels and technologies. To help ensure their safety and the safety of others, first responders must not only understand how alternative fuel and advanced technology vehicles differ from conventional vehicles but also be familiar with the unique considerations and response procedures surrounding these vehicles.

www.cleancities.energy.gov

The U.S. DOE Clean Cities Program is a government-industry partnership designed to reduce petroleum consumption in the transportation sector by advancing the use of alternative fuels and vehicles, idle reduction technologies, hybrid electric vehicles, fuel blends, and fuel economy measures.

www.naftc.wvu.edu/cleancitieslearningprogram

The *National Alternative Fuels Training Consortium* is the only nationwide alternative fuel vehicle and advanced technology vehicle training organization in the U.S.