U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

Alternative Fuels & Federal Fleet Vehicle FAQs

There are many types of alternative fuel vehicles and alternative fuels from which fleet managers can choose. Understanding the differences can help you select the best one–or ones–that meet your needs.

ALTERNATIVE FUEL STATION LOCATOR

New alternative fuel stations are coming online every day. The AFDC has a fuel station locator with search options by fuel, state and even routing capabilities: http://www.afdc.energy.gov/afdc/stations/find_station.php.

There is also an application available for your Internet-enabled cell phone: http://www.afdc.energy.gov/afdc/locator/m/station/

Alternative Fuels

What are alternative fuels?

Alternative fuels are non-petroleum based fuels that could ultimately help reduce the nation's dependence on foreign oil and improve air quality. Use of alternative fuels is one part of a comprehensive Federal fleet strategy to reduce petroleum consumption.

The Energy Policy Act (EPAct) of 1992 defines alternative fuels to include ethanol (blends of 85% or more), electricity, biodiesel (B100), compressed natural gas (CNG), liquefied natural gas (LNG), liquefied petroleum gas (LPG or propane), P-Series fuels, hydrogen, methanol (blends of 85% or more), and coal-derived liquid fuels.

What is an alternative fuel vehicle?

Alternative fuel vehicles (AFVs) are any dedicated vehicle or dual-fueled vehicle designed to run on at least one alternative fuel. AFVs are available in a variety of models ranging from sedans, SUVs, pickup trucks, and vans to heavy-duty buses and trucks.

The National Defense Authorization Act of 2008 amended EPAct 1992 to include fuel cell, lean burn, and hybrid technology vehicles (based on definitions in Section 30B of the Internal Revenue Code of 1986), as well as "any other type of vehicle that the [Environmental Protection Agency's] Administrator demonstrates to the Secretary [of Energy] would achieve a significant reduction in petroleum consumption."

What is a converted or conversion vehicle?

When an original equipment manufacturer (OEM) vehicle, designed to run off conventional gasoline is altered aftermarket to run on alternative fuel or a combination of gasoline and alternative fuel, the vehicle is considered a conversion vehicle. It can also be referred to as retrofitting or a retrofitted vehicle. The most common conversion is altering vehicles to run on CNG and LPG.

ETHANOL

What is ethanol?

Ethanol is an alcohol-based fuel that is produced by fermenting and distilling starch or sugar crops (usually corn, barley, and wheat or sugar cane and fruit) to turn them into simple sugars. Most of the ethanol currently produced in the United States is derived from corn.

What types of ethanol fuels are available?

To oxygenate the fuel and reduce air pollution, nearly half of U.S. gasoline contains ethanol in a low-level blend such as E10 (gasoline containing up to 10 percent ethanol). Ethanol is also increasingly available in E85 (85 percent ethanol, 15 percent gasoline).

Are all ethanol blends alternative fuels?

Only ethanol blends of 85 percent or higher (such as E85) are considered an alternative fuel under EPAct 1992.

Can I use ethanol-blended fuel in my vehicle?

It depends. All vehicles are capable of running on blends of up to 10% ethanol (E10) without any engine modifications needed. Only E85 flexible fuel vehicles (FFVs) are capable of operating on E85.

Electric/Electricity Vehicles

What is an electric vehicle?

An electric vehicle (EV) or battery electric vehicle can be defined as a vehicle that uses chemical energy stored in rechargeable battery packs. The energy comes from an electric grid which can derive its electricity from any number of sources, including coal, nuclear, solar, wind, geothermal, hydroelectric, etc. EVs use an electric motor and motor controllers instead of an internal combustion engine (ICE) as in gasoline powered vehicles.

What are the benefits of an electric vehicle?

More than 95% of the electricity used to charge EVs originates from domestic resources, thus reducing the nation's dependence on foreign oil. Although electricity production may contribute to air pollution, EVs are considered zero-emission vehicles because their motors produce no exhaust or emissions. Also, due to less moving parts than an ICE, service requirements for EVs are fewer than those for gasoline-powered vehicles.

Are EVs and hybrid electric vehicles the same thing?

No. EVs are run solely by an electric motor, where hybrid vehicles combine the ICE of a conventional vehicle with the battery and electric motor of an EV.

What EVs are currently available?

There are currently no light-duty EVs available from the major auto manufacturers. Neighborhood electric vehicles (NEVs), on the other hand, are being manufactured by a variety of companies. These small vehicles are commonly used for neighborhood commuting, light hauling, and delivery. Because they are limited to speeds of 25 mph or less, NEVs are not considered light-duty vehicles under EPAct 1992. However, Federal agencies may include the electricity used in NEVs in reporting their annual alternative fuel use. NEVs have the potential to significantly reduce an agency's petroleum consumption where fleet vehicles are used primarily to support campus-type operations, have low daily vehicle miles traveled (VMT), and have daily (or overnight) access to electricity for recharging.

Biodiesel

What is biodiesel?

Biodiesel is a domestic, renewable fuel that can be made from vegetable oils, animal fats, or recycled restaurant greases. Pure or neat biodiesel is known as "B100" and is considered an alternative fuel under EPAct 1992. It is not the same as raw vegetable oil. It goes through a refinery process called transesterification to remove glycerin, the by-product of biodiesel production. Biodiesel can be blended with any level of petroleum to create a biodiesel blend. The most common blend is B20 (20 percent biodiesel and 80 percent diesel).

What kind of vehicles can use biodiesel?

Any vehicle that currently uses petroleum diesel can use up to a B20 biodiesel blend with little to no modification to the engine. However, not all diesel manufacturers cover biodiesel use in their warranties. DOE recommends consulting your vehicles manufacturer to see if they approve the use of biodiesel in their vehicles.

Natural Gas

What is natural gas?

Natural gas is 90 percent methane and contains a mixture of hydrocarbons that is produced from gas wells or from crude petroleum production. It is clean burning, domestically produced and readily available.

Can natural gas be used in any vehicle?

No. Dedicated natural gas vehicles (NGVs) are designed to run only on natural gas; bi-fuel NGVs have two separate fueling systems that enable the vehicle to use either natural gas or a conventional fuel (gasoline or diesel). NGVs are fueled with CNG or LNG, which are considered alternative fuels under EPAct 1992.

How does NGV performance compare to conventional fuel vehicles?

Typical range for an NGV running on CNG or LNG is less than a conventionally fueled vehicle because of the lower energy content of natural gas.

Liquefied Petroleum Gas/Propane

What is propane?

Liquefied petroleum gas (LPG), or propane, is a readily available by-product of natural gas processing and petroleum refining. Stored under pressure inside a tank, propane turns into a colorless, odorless liquid. As pressure is released, the liquid propane vaporizes and turns into gas that is used for combustion.

What kinds of vehicles run on propane?

Currently only one commercially available light-duty vehicle is available, a propane-dedicated Ford F-150 truck through ROUSH Industries. However, most light-duty vehicles can be converted to run on propane by a certified installer. Propane engines and fueling systems are more readily available for medium- and heavy-duty vehicles like school buses and street sweepers. According to the National Propane Gas Association there are more than 190,000 propane-powered vehicles in the U.S., served by 2,127 propane fueling stations.

LIST OF AVAILABLE ALTERNATIVE FUEL VEHICLES (AFVs)

A searchable listing of commercially available AFVs from 2001-current model year is available through AFDC's Vehicle Make/Model http://www.afdc.energy.gov/afdc/progs/vehicles_search.php

A PDF listing of 2009 model year vehicles: http://www.afdc.energy.gov/afdc/pdfs/my2009_afv_atv.pdf

Another searchable listing is available from FuelEconomy.gov: http://www.fueleconomy.gov/feg/byfueltype.htm

Hydrogen

What is hydrogen fuel?

Hydrogen is among the simplest and most abundant elements, but hydrogen is rarely found alone in nature. Hydrogen is locked up in enormous quantities in water, hydrocarbons, and other organic matter. Efficiently producing hydrogen from these compounds is one of the challenges of using hydrogen as a fuel. Hydrogen can be produced from fossil fuels and biomass and even by electrolyzing water. Producing hydrogen with renewable energy and using it in fuel cell vehicles holds the promise of virtually pollution-free transportation and independence from imported petroleum.

What kinds of vehicles run on hydrogen?

Hydrogen can be used to fuel internal combustion engines and fuel cells, both of which can power low- or zero-emissions vehicles such as fuel cell vehicles. Fuel cell vehicles use a completely different propulsion system than conventional vehicles, and can be two to three times more efficient. Unlike conventional vehicles, they produce no harmful exhaust emissions—their only emission is water.

What fuel cell vehicles are currently available?

Fuel cell vehicles are still at an early stage of development. Research and development efforts are bringing them closer to commercialization.

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