

Propane as a Transportation Fuel



What is Propane?

Motor Fuel Propane, otherwise known as Liquefied Petroleum Gas (LPG), is produced as part of natural gas processing and crude oil refining. In natural gas processing, the heavier hydrocarbons that naturally accompany natural gas, such as LPG, butane, ethane and pentane, are removed prior to the natural gas entering the pipeline distribution system. In crude oil refining, LPG is the first product that results at the start of the refining process, and is therefore always produced when crude oil is refined.

Propane is a gas that can be turned into a liquid at a moderate pressure, 160 pounds per square inch (psi), and is stored in pressure tanks at about 200 psi at 100 degrees Fahrenheit. When propane is drawn from a tank, it changes to a gas before it is burned in the engine. Propane has been used as a transportation fuel since 1912, and is the third most commonly used fuel in the United States, behind gasoline and diesel. More than four million vehicles fueled by propane are in use around the world in light-, medium-, and heavy-duty applications. Propane holds approximately 86 percent of the energy of gasoline and so requires more storage volume to drive a range equivalent to gasoline, but it is price competitive on a cents-per-mile-driven basis.

Benefits of Propane in Transportation Applications

LPG has a long and varied history in transportation applications. It has been used in rural and farming settings since its inception as a motor vehicle fuel.

Over time, propane has been used in several niche applications such as for fork lifts, both inside and outside warehouses, and at construction sites. Use of propane can result in lower vehicle maintenance costs, lower emissions, and fuel costs savings when compared to conventional gasoline and diesel. Presently domestic automakers have reduced their offerings of vehicles that can operate using propane and other gaseous fuels; this has placed renewed emphasis for the conversion or “upfitting” of new vehicles to operate on propane and compressed natural gas now, and possibly hydrogen in the future.



*Propane Dispenser
Courtesy of CleanFuelUSA*

Vehicle conversions in the 1970s started a very large upswing in the numbers of vehicles capable of using propane, as rising gasoline prices compelled drivers to find more economical fuel sources. The propane industry is once again focused on the conversion or upfitting of vehicles, to maintain the fuel as a viable motor fuel alternative that can provide both emission and petroleum displacement benefits, in the absence of original engine manufacturer (OEM) offerings.

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Where is Motor Fuel Propane Available in California?

Approximately 1,200 facilities in California dispense propane. Nearly all of these facilities are used primarily to fuel residential and commercial applications such as heaters, recreational vehicles, and barbecues. About half of all these facilities are capable of providing propane as a motor fuel, though only about three percent of all the fuel dispensed is used for transportation applications. Since 2000, the California state fleet has purchased, and is now operating in daily use, nearly 1,600 bi-fuel Propane Ford F-150 Pickup trucks. The potential use of

propane in those vehicles constitutes the largest petroleum displacement for the state



*Bi-fuel Propane Ford F-150
Courtesy of CleanFuelUSA*

fleet; it could displace approximately 4.4 percent of the total fleet fuel use, if these vehicles were exclusively operated on propane.

Accordingly, the California Energy Commission and the U. S. Department of Energy have provided funding to establish 25 motor fuel propane stations



*Propane Vertical Tank
Courtesy of CleanFuelUSA*

across the state. These stations are situated for convenient use by CalTrans and the Department of Water Resources fleets, and for use by the public. The stations, operated by CleanFuelUSA and

Delta Liquid Energy, are unique from other propane filling stations. They have dispensers on the fueling island at a gasoline station, use fleet fueling cards or credit cards, and offer fuel that is priced competitively with gasoline or diesel on a fuel equivalency basis.

Propane is a low-emission, economic, and easily used fuel that can play an important role as an alternative, non-petroleum fuel for our state and the nation. Given the right conditions and incentives, propane can steadily displace a growing volume of petroleum fuels in California, and therefore help provide a broader, more competitive transportation fuel market in the state.

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