

# F A C T S H E E T

## CLEAN ALTERNATIVE FUELS



In recent years, many studies have shown the connection with traditional gasoline/diesel fuels and health ailments and air quality issues. There are several alternatives to diesel and gasoline fuels for heavy/medium/light-duty vehicle classes. Fuels such as **biodiesel**, **propane**, **ethanol**, **liquefied natural gas** and **compressed natural gas** are now available that offer a clean option. These alternative fuels reduce or eliminate many of the harmful pollutants that clog our air and lungs.

### BIODIESEL

Biodiesel is a mixture of petrodiesel and a renewable source such as:

- Soybean oil
- Sunflower oil
- Cottonseed oil
- Canola oil
- Animal fats



There are several grades of Biodiesel; B20 (20% Biodiesel 80% petrodiesel) is the most common, but B100 (100% Biodiesel) is also available.

Benefits:

- Can be used in any conventional diesel engine
- Typically \$.10 to .20 more per gallon than diesel (For B20)
- No extra maintenance required with B20 blend
- Most tailpipe emissions reduced compared with diesel fuel, with the exception of a slight increase in NOx (2% for B20 and 9% for B100)
- Reduces carbon monoxide emissions by 10% (B20) and 50% (B100)
- Reduces PM by 15% (B20) and 70% (B100)
- Reduces hydrocarbon emissions by 10% (B20) and 40% (B100)

### PROPANE

Propane is a byproduct of natural gas processing and petroleum refining. Propane is odorless, however an odorant is added for safety reasons.

Benefits:

- Propane can lower carbon dioxide, carbon monoxide, and other toxic emissions associated with traditional emissions
- Propane engines are more efficient than traditional gasoline engines
- No special maintenance requirements other than having the vehicle serviced by a professional familiar with the fuel storage and delivery system
- Minimizes problems with starting vehicles in cold weather
- Converting an automobile to dual fuel (gasoline and propane) can cost between \$1,000 and \$2,000
- Propane vehicles are roughly \$2,000-\$5,000 more than their gasoline counterparts

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## **ETHANOL**

Ethanol is produced by fermenting plant sugars, such as corn, wheat, waste papers and other sources. More than 90% of US ethanol production is from corn. The light-duty vehicle ethanol blend is commonly known as E85 (85% ethanol, 15% gasoline). Ethanol can act as an oxygenate when blended with gasoline, reducing emissions to meet clean fuel requirements.

### Benefits of E85:

- Reduce volatile organic compounds (ozone precursor) by 15%
- Reduces carbon monoxide by 40%
- Reduce particulate matter by 20%
- Can be used in “flexible fuel vehicles (FFVs)”
- Can help reduce cold-weather start-up problems

## **LIQUEFIED NATURAL GAS (LNG)**

LNG is odorless, colorless, non-corrosive, and non-toxic. When natural gas is cooled to temperatures of 260 degrees below zero, LNG is formed. Some projects include trapping landfill methane gas and converting it to LNG.

### Benefits:

- Reduces nitrogen oxide and volatile organic hydrocarbon emissions by 50% or more
- Reduces carbon dioxide by 25%
- Reduces toxic and carcinogenic pollutants
- Slight increase in methane emissions
- Produces half the PM of the average diesel vehicle
- Only trained personnel should maintain LNG vehicles
- LNG should be used for frequent driving as a parked vehicle for a week or more will produce a flammable mixture

## **COMPRESSED NATURAL GAS (CNG)**

CNG is odorless, colorless, and tasteless. It consists mainly of methane and is drawn from gas wells or in conjunction with crude oil production. An odorant is usually added to CNG for safety reasons.

### Benefits:

- Reduces PM by 70-90% if using catalyst technology to reduce ultra fine PM (Used only with new CNG Engines)
- Costs \$30,000 more than a diesel bus (cost of fuel similar to diesel)
- Low maintenance compared with gasoline operated vehicles
- Reduces carbon monoxide by 90-97%
- Reduces nitrogen oxide by 35-60%
- Reduces carbon dioxide by 25%
- Less noisy than diesel engines
- Proper training is required for all maintenance personnel
- Fully infrastructure required

**Source:** U.S. EPA Alternative Fuels Website

<http://www.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm#fact>

If you have questions concerning this fact sheet, please contact :  
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