**Biodiesel**

Biodiesel is a biofuel made by chemically reacting alcohol with vegetable oils, fats, or greases, such as recycled restaurant greases, in a process called transesterification. This process separates glycerin in the oil from methyl esters (the chemical name for biodiesel). It is most often in blends of two percent or 20 percent (B20) biodiesel, but can also be used as neat biodiesel (B100). Biodiesel fuels are compatible with and can be used in unmodified diesel engines with the existing fueling infrastructure. It is the fastest growing alternative transportation fuel in the US, with more than 1.1 billion gallons produced in 2012.

Compared to petroleum-based fuel, biodiesel has a more positive impact on the environment. Biodiesel is renewable, safe, and biodegradable, and reduces serious air pollutants, including carbon dioxide emissions, which can reduce the greenhouse gas effect and lessen the effects of global warming. It contains virtually no sulfur, so it can reduce sulfur levels in the nation’s fuel diesel fuel supply. Removing sulfur from petroleum-based fuel results in poor lubrication, but biodiesel is a superior lubricant and can restore the lubricity of diesel fuel in blends of only one or two percent. Biodiesel is also superior in ignition and engine safety than petroleum-based diesel.

There are a few disadvantages to using biodiesel. Emissions of nitrogen oxides (NOx) increase slightly with the concentration of biodiesel in the blend, but there are additives being developed that will decrease NOx emissions, and if used with clean diesel technology, NOx emissions will not increase. B100 and biodiesel blends are also sensitive to cold weather and may require special antifreeze. B100 also cannot be used in vehicles manufactured before 1994 due to problems with rubber and other components in storage tanks. Biodiesel requires oil that can come from food, so it could tie food prices to fuel prices. It also grows mold if not used within 6 months of production and can have high water content if not produced correctly.

Currently, biodiesel is available only through bulk suppliers; there are a growing number of public biodiesel refueling stations in the United States, but they are not widespread. Biodiesel, therefore, is more practical for fleets with personal fueling facilities (i.e. public transportation buses, commercial vehicles, government vehicles) and is delivered by distributors directly to fleet operators. In Europe, however, biodiesel consumption is much higher because of greater availability to the general public. Based on a study of biodiesel consumption in 2011, Europe as a whole consumed more than four times the amount of biodiesel daily than the United States did. Public availability is increasing in the United States as the market expands. In 2007, Oregon mandated the addition of at least two percent biodiesel in every gallon of diesel fuel, and it also became the first US state to provide incentives for local production of feedstock for alternative, renewable fuels, including biodiesel. Biodiesel is proving to be a cost-effective, environmentally healthy alternative to fossil fuels.





