

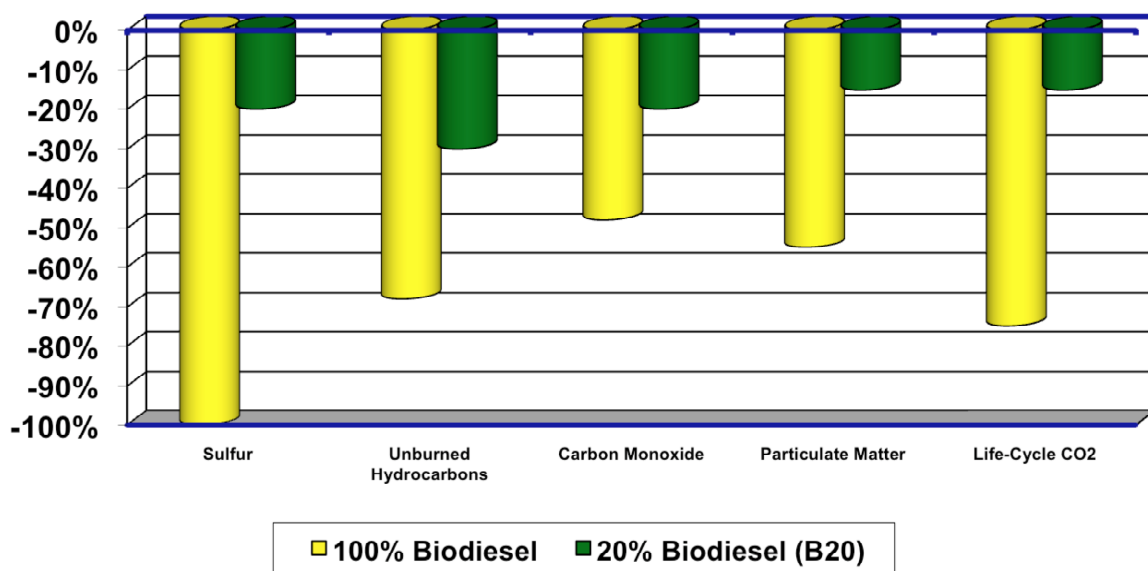


## BIODIESEL DEFINITION AND BENEFITS

Biodiesel is a non-petroleum based diesel fuel which consists of the mono alkyl esters of long chain fatty acids derived from renewable lipid sources. Biodiesel is typically produced through the reaction of a vegetable oil or animal fat with methanol in the presence of a catalyst to yield glycerin and biodiesel (chemically called methyl esters).

Biodiesel is registered with the US Environmental Protection Agency as a pure fuel or as a fuel additive and is a legal fuel for commerce. Biodiesel is an alternative fuel which can be used in neat form, or blended with petroleum diesel for use in compression ignition (diesel) engines. Its physical and chemical properties as it relates to operation of diesel engines are similar to petroleum based diesel fuel. The specification for biodiesel is approved by the American Standards for Testing and Materials (ASTM) under code number 6751.

- 1) Biodiesel runs in any conventional diesel engine. No engine modifications are necessary to use biodiesel.
- 2) Biodiesel dramatically reduces harmful emissions that cause environmental problems such as global warming, acid rain and smog. Biodiesel reduces CO<sub>2</sub> emissions by over 78% compared to petroleum diesel. Even blended with petroleum diesel, biodiesel significantly reduces emissions. Furthermore, the plants used to make biodiesel feedstock absorb more CO<sub>2</sub> as they grow than the biodiesel produces when it is burned. See emission reduction chart below for additional emission reduction data. Bars represent the percentage of reduction in each emission category.



\*Sources--US EPA, US Dept. of Energy, & National Renewable Energy Laboratory (NREL)



- 3) Health problems as a result of emissions exposure are also greatly reduced by the cleaner emissions of biodiesel. According to the American Lung Association biodiesel emissions are 90% less toxic than petro-diesel and will reduce incidents of health hazards such as asthma, emphysema and lung cancer.
- 4) Biodiesel is domestically produced. Biodiesel benefits American farmers, American businesses and the national economy. Job creation, new markets for domestic agricultural products, and keeping our energy dollars domestic are just a few of the many economic benefits gained by using biodiesel instead of imported petroleum diesel.
- 5) Biodiesel is a renewable fuel source. Unlike fossil fuels, biodiesel is made from vegetable oilseed crops grown in America, which replenishes the market annually with renewable feedstock.
- 6) Biodiesel is rapidly biodegradable and non-toxic. Biodiesel handling and use is far less damaging to the environment than petroleum fuel, and is particularly superior in the event of a spill or leak.
- 7) Biodiesel can be stored anywhere that petroleum diesel fuel is stored. All diesel fueling infrastructure including pumps, tanks and transport existing trucks can be used with biodiesel.
- 8) Biodiesel can be used alone or mixed in any amount with petroleum diesel fuel. A 20% blend of biodiesel with diesel fuel is called "B20," a 5% blend is called "B5" and so on.
- 9) Biodiesel has superior lubrication quality than that of diesel fuel. It increases engine life and can be used to replace sulfur, the acid-rain-causing lubricating agent in petroleum diesel.
- 10) Biodiesel is safer to transport. Biodiesel has a high flash point, or ignition temperature, of about 300 degrees F compared to petroleum diesel fuel, which has a flash point of 125 degrees F.
- 11) Engines running on biodiesel run normally and have similar fuel mileage to engines running on diesel fuel. Auto ignition, fuel consumption, power output, and engine torque are relatively unaffected by biodiesel.
- 12) Biodiesel has a pleasant aroma in comparison to the toxic smell of petroleum diesel fuel.
- 13) Biodiesel is recognized by the EPA as an alternative fuel and is the only alternative fuel that has successfully completed Tier I and Tier II Health Effects Testing under the Clean Air Act and meets clean diesel standards established by the California Air Resources Board.
- 14) Biodiesel saves money. Engines running on biodiesel have been shown to need less maintenance. Also, biodiesel use allows federal fleet managers to keep existing equipment on the road longer and still adhere to new, stricter emissions standards.

