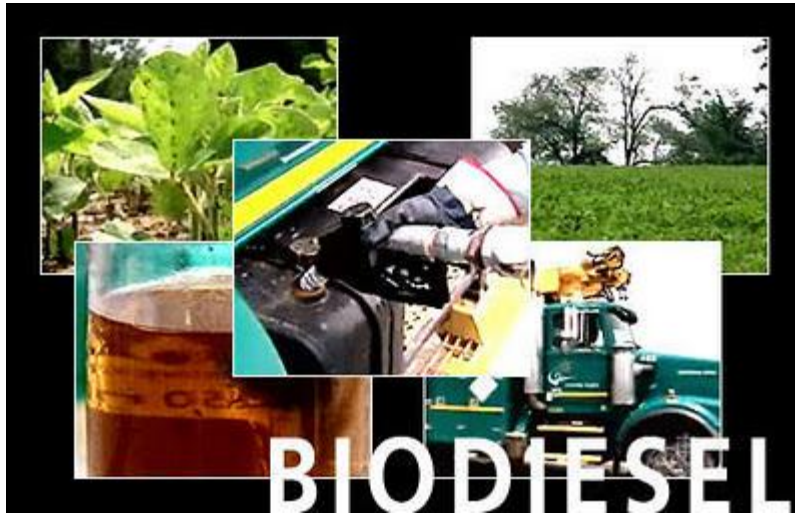


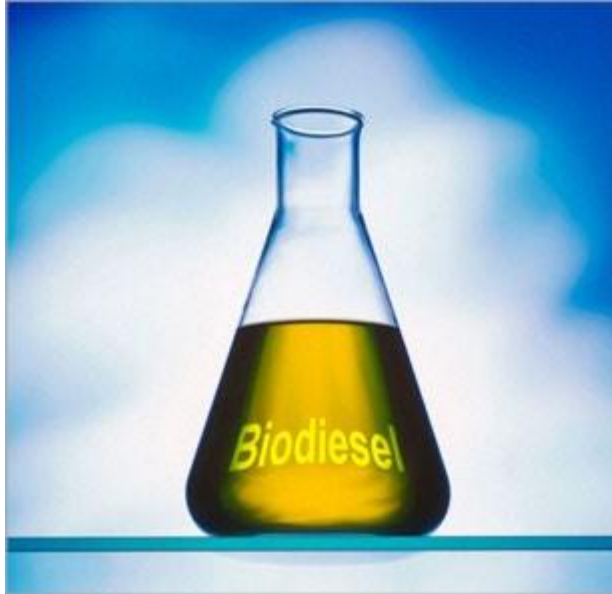
Biodiesel



Biodiesel is a renewable fuel manufactured from vegetable oils, animal fats, and recycled cooking oils. Biodiesel offers many advantages:

- It is renewable.
- It is energy efficient.
- It displaces petroleum derived diesel fuel.
- It can be used in most diesel equipment with no or only minor modifications.
- It can reduce global warming gas emissions.
- It can reduce tailpipe emissions, including air toxics.
- It is nontoxic, biodegradable, and suitable for sensitive environments.
- It is made in the United States from either agricultural or recycled resources.
- It can be easy to use if you follow these guidelines.

Biodiesel is a diesel replacement fuel that is manufactured from vegetable oils, recycled cooking greases or oils, or animal fats. Because plants produce oils from sunlight and air, and can do so year after year on cropland, these oils are renewable. Animal fats are produced when the animal consumes plant oils and other fats, and they too are renewable. Used cooking oils are mostly made from vegetable oils, but may also contain animal fats. Used cooking oils are both recycled and renewable.



The biodiesel manufacturing process converts oils and fats into chemicals called long chain mono alkyl esters, or biodiesel. These chemicals are also referred to as fatty acid methyl esters or FAME. In the manufacturing process, 100 pounds of oils or fats are reacted with 10 pounds of a short chain alcohol (usually methanol) in the presence of a catalyst (usually sodium or potassium hydroxide) to form 100 pounds of biodiesel and 10 pounds of glycerine. Glycerine is a sugar, and is a co-product of the biodiesel process.

Benefits of Biodiesel Use

Biodiesel Displaces Imported Petroleum

The fossil fuel energy required to produce biodiesel from soybean oil is only a fraction (31%) of the energy contained in one gallon of the fuel.

You get 3.2 units of fuel energy from biodiesel for every unit of fossil energy used to produce the fuel. That estimate includes the energy used in diesel farm equipment and transportation equipment (trucks, locomotives), fossil fuels used to produce fertilizers and pesticides, fossil fuels used to produce steam and electricity, and methanol used in the manufacturing process. Because biodiesel is an energy-efficient fuel, it can extend petroleum supplies and makes for sound state or federal energy policy.

Biodiesel Reduces Emissions

When biodiesel displaces petroleum, it reduces global warming gas emissions such as carbon dioxide (CO₂). When plants like soybeans grow they take CO₂ from the air to make the stems, roots, leaves, and seeds (soybeans). After the oil is extracted from the soybeans, it is converted into biodiesel and when burned produces CO₂ and other emissions, which return to the atmosphere. This cycle does not add to the net CO₂ concentration in the air because the next soybean crop will reuse the CO₂ in order to grow.

Biodiesel and Human Health

Some PM and HC emissions from diesel fuel combustion are toxic or are suspected of causing cancer and other life threatening illnesses. Using B100 can eliminate as much as 90% of these "air toxics." B20 reduces air toxics by 20% to 40%. The effects of biodiesel on air toxics are supported by numerous studies, starting with the former Bureau of Mines Center for Diesel Research at the University of Minnesota. The Department of Energy (DOE) conducted similar research through the University of Idaho, Southwest Research Institute, and the Montana Department of Environmental

Quality. The National Biodiesel Board conducted Tier I and Tier II Health Effects Studies that also support these claims.

Biodiesel Improves Lubricity

By 2006, all U.S. highway diesel will contain less than 15 ppm sulfur—ultra low sulfur diesel fuel (ULSD). Currently highway diesel contains 500 ppm sulfur (or less). Biodiesel typically contains less than 15 parts per million (ppm) sulfur (sometimes as low as zero). Some biodiesel produced today may exceed 15 ppm sulfur, and those producers will be required to reduce those levels by 2006 if the biodiesel is sold into on-road markets.

Biodiesel is Easy to Use

And last, but maybe not least, the biggest benefit to using biodiesel is that it is easy. In blends of B20 or less, it is literally a “drop in” technology. No new equipment and no equipment modifications are necessary. B20 can be stored in diesel fuel tanks and pumped with diesel equipment.

Source:

<http://chemichal-engineering.blogspot.in/2011/10/biodiesel.html>