

Clean & Green Fuel

By [Donald Hawthorne](#)

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Biodiesel seems to be the growing trend across the country as trucking companies and owner-operators seek ways to cut their costs. Equipping trucks and trailers with super-wide single tires, limiting idling time, manufacturing trucks and trailers with more aerodynamic designs and governing engines to 62-65 mph are a few examples. There is a proposal to require engine manufacturers to govern their engines at 68 mph before leaving the factory.

The ingredients for producing biodiesel are in abundance, eliminating the fear of running out of supply. Soybean oil, mustard seed oil, rapeseed oil, animal fats and alcohol are all used to manufacture biodiesel. The oils or fats, which are hydrocarbons, are filtered and mixed with alcohol, usually methanol, and a catalyst (sodium or potassium hydroxide). The product of their reaction is the biodiesel, which is an ester, a fragrant organic compound, and glycerol, which is used in some cosmetics.

The method used to produce biodiesel is called "transesterification." Dr. Charles Peterson, who has been working with biofuel since 1979, says that biodiesel can be made from almost any plant-derived oil. The chemical and physical properties are similar to petroleum-based diesel as far as engine compression and ignition. Therefore, biodiesel may be used without any modification to the engine. There is one initial problem: biodiesel will clean the engine, causing filters to clog.

There are many advantages to using biodiesel, including lower emissions, better scent and higher lubricity. According to the U.S. Department of Energy, biodiesel has a lower energy content than regular diesel, but performs as well as traditional diesel fuel when mixed with diesel in blends of up to 20 percent. Biodiesel labeled B20 means that the blend is 80 percent diesel and 20 percent biodiesel. The ratio of energy gained to energy used to produce it is 1-to-3.5, which means for every unit of fossil fuel energy needed to produce biodiesel, the return is 3.5 units of energy, according to a 2008 study at the University Idaho in cooperation with the Department of Energy.

The National Biodiesel Board teamed up with the Chicago-based Indigenous

Energy, developers of emissions tracking systems, and the Los Angeles-based State Logistics, a fleet and logistics company using clean technology, on the first over-the-road CO₂-reduction study with biodiesel in the United States.

State Logistics used B5 and B99 in seven 2007 trucks, running an average of 27,000 miles per month. The pilot showed a 78 percent reduction of CO₂ emissions when using biodiesel. The results in May and June 2007 showed a 16.5-ton reduction of CO₂ emissions. Several of the measures used to show a carbon footprint were distance traveled, amount of fuel used, percentage of biodiesel and type of biodiesel used.

“REG has been the most trusted biodiesel manufacturer among fleet managers, transportation managers and diesel vehicle operators across the United States for more than 10 years,” explains Gary Haer, REG vice president of sales and marketing. “They were the first biodiesel producers and manufacturers in the country to exceed the American Society for Testing and Materials [ASTM] strict biodiesel specifications, regardless of feedstock.”

The ASTM committee is composed of fuel producers, engine manufacturers and third-party interests (users, consultants and government agencies). Some standards take more than 10 years to gain agreement and to be issued the ASTM label. REG also performs tests not required by ASTM, including tests for total moisture and a cold-soak filtration test, which indicates how well REG biodiesel will perform in cold weather.

With biodiesel D6751 specifications, there have been more than 45 million miles of successful, problem-free, real-world operation, with B20 blends in a variety of engines, climates and applications. REG also introduced a new lineup of three types of biodiesel with ratings REG-9000 tm. The REG-2000 tm rating indicates very high-quality specifications. In 2007, REG sold approximately 25 percent of all biodiesel used in the United States.

“The REG currently has seven biodiesel facilities with 220 million gallons of production capacity,” Haer says. “They also have four facilities under construction, which will be operational by 2009-2010. The capacity will then be 400 million gallons.

Haer has also served for more than eight years on the National Biodiesel Board (NBB), which coordinates biodiesel research and development in the United States

and acts as a “watchdog” over the biodiesel industry. He currently serves as vice chairman of the NBB Executive Committee for the National Council of Farmer Cooperatives. “Biodiesel is safe for animals, humans [and] the environment, and it burns cleaner (78 percent reduction in emissions) than petroleum fuel, and it isn’t as explosive as gas or diesel,” he says.

Biodiesel is a renewable source of fuel that creates an opportunity for the United States to become less dependent on foreign suppliers. It is sulfur-free, which will also extend the life of catalytic converters, and it can be used for home heating. There have been concerns by environmentalists that biodiesel causes destruction of the atmosphere, contributes to global warming and deprives the planet of natural sponges that absorb carbon emissions. Timothy Searchinger, author of “Studies and Research in Environmental Economics” at Princeton University, says, “Most of the biofuel that people are using would probably increase greenhouse gases substantially.” Haer is confident that the problems pertaining to supplying, producing, marketing or selling of biodiesel have been discovered and dealt with, offering the public a safe and reliable source of energy.

Engine manufacturers have been asked if the use of biodiesel would create a problem with warranties. They responded that the use of fuel, biodiesel or otherwise, is not a warranty issue. As biodiesel becomes more popular, manufacturers have been testing their diesel equipment using different blends of biodiesel, such as B5 and B10. It has been agreed that a blend of 5 percent biodiesel to 95 percent petroleum is approved as recommended fuel, as long as it adheres to the standards set by ASTM-D6751.

There are 171 biodiesel plants nationwide, and the industry has produced 500 million gallons of biodiesel. It appears that biodiesel is catching on. And let’s hope that one day, the United States can supply its own fuel, independent of foreign suppliers.