



# Biodiesel

## FACTS ABOUT BIODIESEL

## What is biodiesel?

Biodiesel is a non-petroleum-based diesel that is made from vegetable oil, recycled restaurant grease, or animal fats. Pure biodiesel is renewable and clean-burning form of diesel.

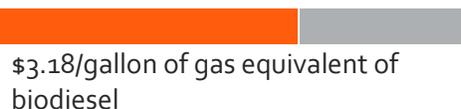
Typically, biodiesel can be blended with petroleum diesel. Biodiesel blends range from B2 (2% biodiesel, 98% petroleum diesel) to B99 (99% biodiesel, 1% petroleum diesel). Pure biodiesel is B100, or often referred to as neat biodiesel. B20 is the most common biodiesel blend in the United States.

*How many public stations are in the San Diego region?*

There are currently three public Biodiesel stations in the San Diego region.

*How much does it cost to fuel my vehicle?*

B20 blends cost \$3.18/gallon, whereas pure biodiesel (B99-B100) cost \$4.02/gallon.



- Biodiesel is biodegradable
- Biodiesel is produced from co-products and byproducts of crops already being grown
- Biodiesel has the highest energy balance of any fuel
- 4.6 billion gallons of biodiesel produced in the U.S. since 2005 have reduced lifecycle greenhouse gas (GHG) emissions by 56.2 billion gallons – the equivalent of removing almost 5 million passenger vehicles from America's roadways
- GHG emissions for B100 could be more than 52% lower than for petroleum diesel.

## What types of vehicles can use biodiesel?

- Passenger vehicle
- Vanpool – shuttle
- Refuse hauler
- Sweeper
- Other medium/heavy-duty vehicles



### Did you know...

Many light-duty diesel vehicles can also take low percentage blends of biodiesel. Typically, most vehicle manufacturers will allow up to a B5 blend without voiding the vehicle warranty. Visit the National Biodiesel Board for more information: <http://www.biodiesel.org/using-biodiesel/oem-information>



## Where can I learn more?

- Alternative Fuel Data Center - [www.afdc.energy.gov/fuels/biodiesel.html](http://www.afdc.energy.gov/fuels/biodiesel.html)
- National Biodiesel Board – [www.biodiesel.org](http://www.biodiesel.org)
- Biodiesel Education Network – [www.askben.info](http://www.askben.info)
- Drive Biodiesel – [www.drivebiodiesel.net](http://www.drivebiodiesel.net)
- National Biodiesel Foundation – [www.biodieselfoundation.org](http://www.biodieselfoundation.org)

# Are Biodiesel Vehicles for your Fleet?

You may not be sure whether or not a biodiesel vehicle is the right decision for your fleet. The following tools and resources are available to help guide you through your decision-making process.

## Learn from examples of fleets that are using Biodiesel in their daily operations

**Fleet Put Biodiesel to the Test:** Recent studies and experiences have shown that using biodiesel in lieu of petroleum diesel has resulted in no significant differences in performance, maintenance, or fuel efficiency. Read more at <http://www.businessfleet.com/article/story/2009/04/fleets-put-biodiesel-to-the-test/>.

**Biodiesel Helps Cut a City's Carbon Footprint:** The City of Asheville, NC cut its carbon footprint by 4.5% from the prior year by switching from B5 to B20. The increase biodiesel use accounted for 40% of the carbon footprint improvement. Read more at <http://www.government-fleet.com/channel/green-fleet/news/story/2015/02/biodiesel-use-helps-city-meet-carbon-reduction-goals.aspx>.

**Biodiesel Offers Fleets a Better Alternative:** Community Fuels offers a fact sheet describing the advantages of using biodiesel in fleet vehicles. Read more at <http://westcoastcollaborative.org/files/BBG/enduser-appendix/Community-Fuels-Factsheet-Biodiesel-Alt-for-Fleets.pdf>.

**Essential Baking Co. Uses Biodiesel:** Clean Cities Now Vol. 16, No. 2 offers an in-depth case study of Essential Baking Co.'s partnership with California-based Propel Fuels for its biodiesel needs. Read more at [http://www.afdc.energy.gov/uploads/publication/ccn\\_16\\_2.pdf](http://www.afdc.energy.gov/uploads/publication/ccn_16_2.pdf) (page 4).

Several San Diego fleets also use biodiesel:



# Financing your Biodiesel Vehicle

You've decided that it makes sense to consider using biodiesel for your fleet vehicles. However, it is still unclear what it will cost and how much infrastructure will cost. These tools are intended to help you better understand the financial benefits of adopting biodiesel and the costs associated with their procurement.

## Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool

The AFLEET tool is developed by the Department of Energy's Clean Cities Program. It estimates the environmental and economic costs of adopting alternative fuel vehicles into your fleet. It takes into consideration fuel costs, fuel types, and vehicle purchase price. Before getting started with this tool, having the following data available will strengthen the estimates returned:

- Vehicle class your fleet would likely adopt
- Annual vehicle miles of a single vehicle
- Vehicle purchase price
- Useful life of fleet vehicle(s).
- Will there be a loan to help procure the vehicles? If so, what are the terms of the loan?

Take advantage of this tool here: <https://greet.es.anl.gov/afleet>.

The [Alternative Fuel Data Center's Vehicle Cost Calculator](#) shows the total cost of ownership and emissions for a large variety of makes and models of most vehicles, including alternative fuel vehicles. You can also create your own custom vehicle if you cannot find the model you want. The tool is: <http://www.afdc.energy.gov/calc/>.

According to the Alternative Fuel Data Center, biodiesel users save, on average, \$300-\$400 annually per vehicle.

## Incentives

There are various incentives available. **\*\*More information to be added about incentives here\*\***

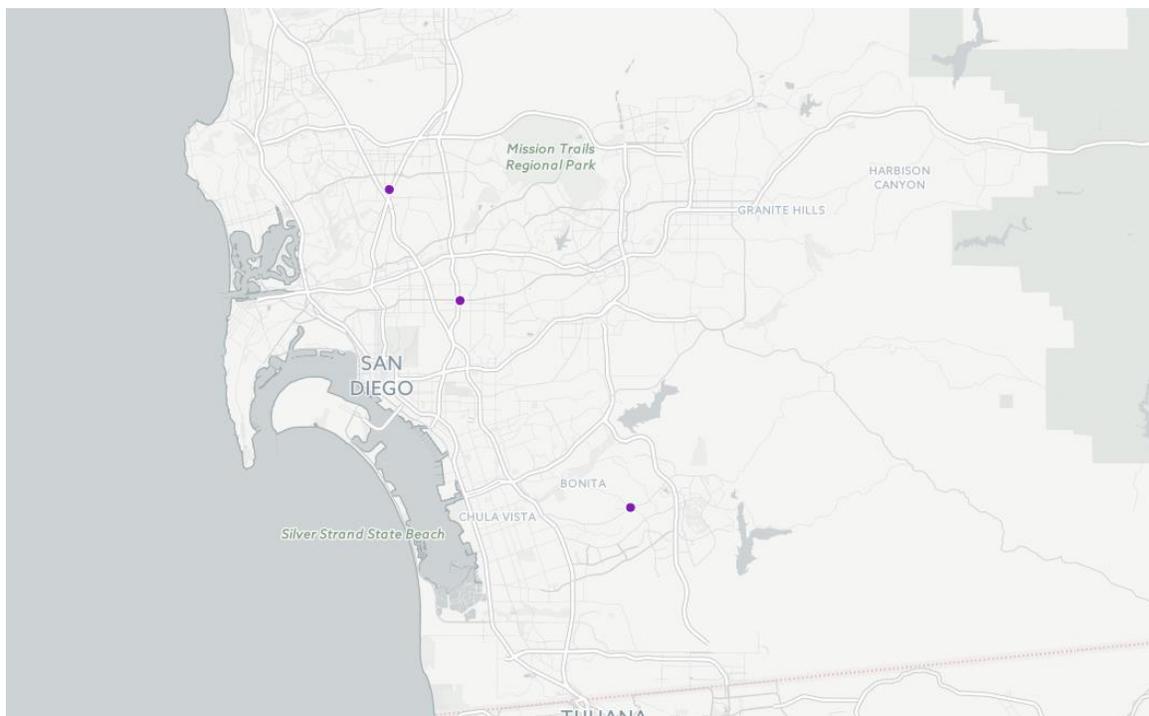
Incentive Name	Incentive Description
PLACEHOLDER FOR INCENTIVES	

# Fueling Stations

## Using Fueling Stations

Fleets that want to incorporate biodiesel into their fleet operations can typically either rely on public fueling stations or install their own, private, fueling station.

### Map of Biodiesel (B20 or higher) Fueling Stations in San Diego Region



[http://www.afdc.energy.gov/fuels/biodiesel\\_locations.html](http://www.afdc.energy.gov/fuels/biodiesel_locations.html)

## Installing Biodiesel Equipment

Installing biodiesel equipment is very similar to installing conventional gasoline equipment. These are considerations to have in mind when adding a private fueling station:

- **Determine fueling specifications** – how much fuel storage is needed for your fleet? Ensure to store enough fuel for 30- or 60-day periods. If there are other fleets nearby, it may be possible to share transport loads.
- **Is there an existing tank to be repurposed for E85?** – if so, ensure that the tank is properly cleaned out and that it is compatible with holding ethanol blends of E10 and above.
  - **Underground tank:** It may be necessary for the existing underground storage tank's manufacturer to provide a statement of compatibility of their product with certain biofuel blends. All tank manufacturers have issued statement of compatibility with blends up to 100%. Read more in the EPA's guidance for the storage of biofuel blends in existing tanks: <http://www.epa.gov/oust/altfuels/biofuelsguidance.htm>
  - **Above-ground tank:** Above-ground manufacturers have provided statements of compatibility with all biodiesel blends.
- **Dispensers:** It is preferred to install UL-certified B20 and B100 dispensing equipment.

Read more about the proper handling, storing, and dispensing of E85: <http://www.nrel.gov/transportation/pdfs/43672.pdf>.

### How to Buy Fuel

When buying fuel for bulk use, it may benefit your fleet to ensure that the fuel works well for your fleet's characteristics. It is recommended that the biodiesel purchased meets ASTM benchmark standards (for B6-B20, ASTM D7467-13; for B100, ASTM D6751-12).

To ensure quality product, take the necessary steps to make sure that your storage tanks are free from contamination. To be extra careful, obtain fuel from a AQ-9000 accredited producer or certified fuel marketer.

Read more about these troubleshooting tips, visit: [http://www.biodiesel.org/docs/default-source/ffs-performance\\_usage/fuel-quality-and-performance-guide.pdf](http://www.biodiesel.org/docs/default-source/ffs-performance_usage/fuel-quality-and-performance-guide.pdf).

### Codes and Standards

When installing a fueling station, it is important to adhere to the necessary codes and standards. This guidance document provides a thorough list of codes and standards when developing biodiesel infrastructure: <http://www.afdc.energy.gov/pdfs/48603.pdf>.

The general standards for the dispensing and storage of biodiesel and ethanol fall under the National Fire Protection Association (NFPA) 30 Flammable and Combustible Liquids Code. It covers fire and explosion prevention, storage of liquid in containers, storage systems, and processing facilities. More specific codes and standards for other aspects of biofuel stations are found in the following table. Many of these codes and standards also apply to conventional gasoline fueling stations.

Fueling Station Aspect	Pertinent Codes and Standards
Containers	NFPA 30 American Society for Testing and Materials (ASTM) Standards for Containers American National Standards Institute (ANSI)/ Underwriters Laboratory (UL) Standards for Containers US Department of Transportation (DOT) 10CFR49
Dispensing Operations	NFPA 30 NFPA 30A NFPA 385 NFPA 10
Storage of Liquids	UL 2245, 2080, 2085 NFPA 91, 30A Steel Tank Institute (STI) Corrosion Control Standards