



# Ethanol

## FACTS ABOUT ETHANOL

## What is ethanol?

Ethanol is a renewable fuel made from various plant materials ("biomass") including corn, sugar cane, barley, and wheat.

There are several blends of ethanol: E10 (10% ethanol, 90% gasoline), which is commonly used in U.S. gasoline, E15 (15% ethanol), and E85 (85% ethanol).

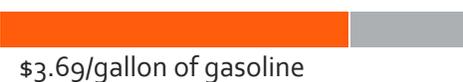
Ethanol is typically offered as E85 and can be used in flex-fuel vehicles, which run on high-level ethanol blends, gasoline, or blend of both.

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

There are seven public ethanol (E85) stations in the San Diego region.

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

Ethanol costs \$2.21/gallon to fuel your vehicle.



- The use of 13.3 billion gallons of ethanol in 2012 reduced GHG emissions from vehicles by 33.4 million metric tons – that's like removing 5.2 million vehicles from the road
- One bushel of corn equals approximately 2.8 gallons of ethanol
- Flex-fuel vehicles can use any blend above E15.
- Flex-fuel vehicles account for one out of every three vehicles in the entire federal fleet
- Cellulosic ethanol could reduce life cycle GHG emissions by 86%

## What types of vehicles can use ethanol?

- Passenger vehicle
- Pick-up trucks
- Police vehicles
- Vanpool – shuttle
- Heavy-duty trucks

Already, over 95% of the gasoline used in the U.S. contains 10% ethanol for its environmental benefits.



### Did you know...

There are over 80 model year 2015 flex-fuel vehicles available in the U.S.

## Where can I learn more?

- Alternative Fuel Data Center - [www.afdc.energy.gov/fuels/ethanol.html](http://www.afdc.energy.gov/fuels/ethanol.html)
- Choose Ethanol - [www.chooseethanol.com/](http://www.chooseethanol.com/)
- American Coalition for Ethanol – [www.ethanol.org](http://www.ethanol.org)
- Ethanol Across America – [www.ethanolacrossamerica.net](http://www.ethanolacrossamerica.net)



# Are Ethanol (E85) Vehicles Right for your Fleet?

You may not be sure whether or not a flex-fuel 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 ethanol in their daily operations**

**The Ethanol Heavy-Duty Truck Fleet Demonstration Project :** This case study examines a demonstration project involving four heavy-duty, over-the-road trucks that used E85 blends. <http://www.afdc.energy.gov/pdfs/3598.pdf>

**Idaho County Employs FFVs and Idle Reduction:** This video shows how a county in Idaho has committed to using ethanol in its fleet. Due to ethanol use and new idle reduction policies, the county saved over \$105,000 in fuel in one year. Watch the video: <http://www.afdc.energy.gov/case/663>

**City of Hoover Fleet Boasts 200-Plus Flex Fuel Vehicles:** The City of Hoover's FFV fleet has traveled over 20 million miles between 2004 and 2013, using over 1.5 million gallons of E85. Read more: <http://www.afdc.energy.gov/case/1423>

**Mammoth Cave National Park Uses E85:** In 1999, the national park committed to using E85 in its FFVs and installed their own refueling station. Watch the video: <http://www.afdc.energy.gov/case/83>



# Financing your E85/Flex-Fuel Vehicle

You've decided that it makes sense to consider buying flex-fuel 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/>.

## Incentives

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

Incentive Name	Incentive Description
PLACEHOLDER FOR INCENTIVES	

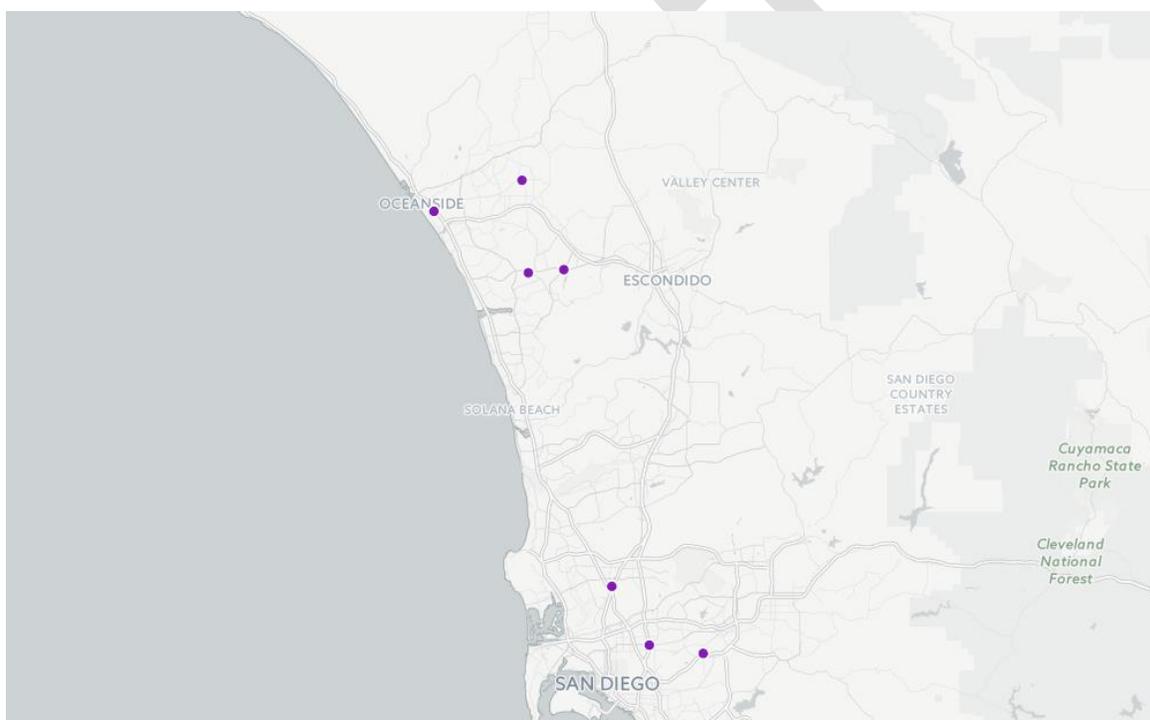
# Fueling Stations

## Using Fueling Stations

Fleets that want to incorporate E85 into their fleet operations can typically either rely on public fueling stations or install their own, private, fueling station.

When installing new petroleum fuel tanks, or upgrading old fuel tanks, it is recommended that your fleet uses or upgrades to an ethanol-compatible tank. Even if your fleet is not yet ready to have a tank dedicated exclusively to ethanol blends, this ensures cost savings in the future if your fleet ever does decide to have a private, dedicated E85 fueling station.

Map of E85 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 E85 Equipment

Installing E85 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 ethanol blends. All tank manufacturers

have issued statement of compatibility with blends up to 98%. 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 ethanol blends including E85.
- **Dispensers:** It is preferred to install UL-certified E85 equipment, which became available in 2010.

Read more about the proper handling, storing, and dispensing of E85:

[http://www.afdc.energy.gov/uploads/publication/ethanol\\_handbook.pdf](http://www.afdc.energy.gov/uploads/publication/ethanol_handbook.pdf).

Read more about E15 and Infrastructure: [http://www.afdc.energy.gov/uploads/publication/e15\\_infrastructure.pdf](http://www.afdc.energy.gov/uploads/publication/e15_infrastructure.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 ethanol 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