

# CASE STUDY



**Location:** Orlando, FL

**Company:** University of Central Florida

**Study:** Ethanol



*E85 fueling pump. Source: University of Central Florida.*

The University of Central Florida (UCF) is an institution in Orlando that sits on more than 1,415 acres. The school offers more than 200 degree programs, and services more than 59,000 students annually. Beyond offering diversified degree programs to the students, the school is also dedicated to helping reduce its dependence on foreign oil. Along with this initiative, the school also wants to reduce the amount of emissions it produces from university vehicles.

Ethanol is a domestically produced renewable fuel that is becoming more available across the United States. Ethanol can be made from corn, sugar cane, and various other agricultural sources. Using ethanol in compatible vehicles reduces the amount harmful emissions that are produced when the fuel is combusted. Beyond this, the use of ethanol supports jobs and industry within the U.S.

### Decisions Points

UCF uses many different vehicles to help maintain its campus and keep up with transportation needs. Because of this, university officials wanted to explore options to reduce the amount of fuel that was used on an annual basis. UCF's Climate Actions Plan calls for the university to be completely carbon neutral by 2050. To accomplish this, the university will have to change the way it operates and consider new sources to fuel its fleet.

Ethanol is water soluble, biodegradable, and less toxic than conventional gasoline. Also, the use of ethanol produces fewer emissions when compared to the exhaust of conventional gasoline engines. All of these factors made ethanol a viable fuel for the fleet at UCF. These reductions will help the university reach its goal of being carbon neutral in the future.

# Ethanol Case Study

## Fleet Facts

UCF utilizes many different vehicles in its fleet. However, 48 of these vehicles are flexible fuel vehicles. Flexible fuel vehicles are able to use E85 (up to 83% ethanol) without modification. The flexible fuel vehicles utilized by the university are mostly mid-sized sedans.

The flexible fuel vehicles in the university's fleet travel approximately 67,684 miles annually. It is estimated that these vehicles achieve around 20 miles per gallon (depending upon use and required operation). For example, UCF has used 3,000 gallons of E85 over the past 12 months. This would give the fleet of flexible fuel vehicles an average fuel economy of 22.6 miles per gallon.

UCF utilizes an ethanol station directly on its campus, which allows for onsite fueling of all flexible fuel vehicles. This station is equipped with a 12,000 gallon fuel tank and allows the university to purchase E85 in bulk from its supplier, Lynch Oil Company, Inc. Lynch is located just south of Orlando, which allows for timely deliveries of fuel as needed.

## QUICK FACTS

**Fuel Type:** E85

**Number of Vehicles:** 48

**Total Miles Driven:** 67,684 per year

**Estimated Fuel Consumption:** 3,000 gallons per year



University of Central Florida's E85 fueling station. Source: University of Central Florida.

## Fuel Supply and Infrastructure

UCF gets their ethanol from a fuel supplier relatively close to their fueling station location. When the fuel is delivered, it is in the form of pure ethanol. The fuel is blended with conventional gasoline onsite to produce E85, the final product. This process has allowed UCF to order fuel in bulk and maintain their facility on campus.

Once the fuel arrives on UCF's campus, the blending and tank filling processes take approximately one day. This ensures that the fuel is ready to use in the university's flexible fuel vehicles. When the tank is filled, all flexible fuel vehicles can be fueled and use the E85.

### Costs

Depending upon vehicle model, flexible fuel vehicles may cost more than their conventional fuel counterparts. In order to use blends of ethanol higher than 10 to 15 percent, specific modifications may have to be made to vehicle components. These components may increase the purchase price of these vehicles.

While these vehicles may cost more initially, utilizing ethanol as a fuel will help recoup these costs. Depending upon the production location and the fuel sources used to create the ethanol, the fuel may cost less than conventional gasoline. Flexible fuel vehicle drivers that are able to consistently use ethanol at prices less than conventional gasoline will be able to quickly recover any costs of initial vehicle investment.



Fueling a flexible fuel vehicle. Source: University of Central Florida.

### Maintenance and Satisfaction

The use of E85 in the flexible fuel vehicles at UCF has warranted a good rating from those involved with the vehicles. Since flexible fuel vehicles perform very similarly if not identically to conventional vehicles, drivers should not need any training to operate the vehicle. The only difference between these vehicles and conventional vehicles would involve fueling the vehicle on the campus as opposed to off site fueling.

The only issue that has presented itself in conjunction with this project involved finding a qualified driver to deliver the fuel. Ethanol is a fuel that is regulated by the Department of Homeland Security, and must be transported under strict guidelines. The driver selection process was handled by Lynch Oil Company, UCF's ethanol supplier, and the university has not had any further concern.

### Summary

Ethanol is a fuel that is safe, domestically renewable, and more environmentally friendly than conventional fuels. The University of Central Florida has incorporated the use of E85 with some of its vehicles to reduce the amount of emissions those vehicles produce. This process has been incorporated into a larger plan to make the university carbon neutral by 2050. This process has allowed the university to offer onsite fueling while decreasing its dependence on foreign oil.



*Fueling a flexible fuel vehicle. Source: University of Central Florida.*