

# BIODIESEL

Coalition of Missouri

BIODIESEL.  
ENERGY

MISSOURIBIODIESEL.ORG



# About BCM

## Vision:

- Promote the commercial success of biodiesel in Missouri

## Members

- Biodiesel Producers
- Fuel Suppliers
- Allied Industry

## Programs:

- Biodiesel promotion & education
- Diesel mechanic training
- Fuel & tank testing
- Policymaker education



# Today's Fleets Have Targets to Meet

- Emissions & Sustainability
- Performance & Maintenance
- Budgetary

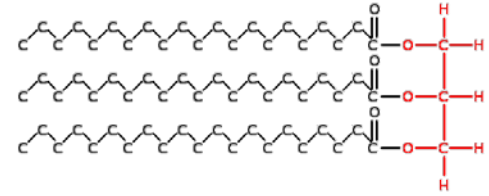
## Many Fuel & Vehicle Technology Options

- Clean Diesel
- Hybrid
- Biodiesel
- CNG
- Propane
- Electric

**Why choose  
biodiesel???**



# Biodiesel



## Technical Definition

**Biodiesel**, n. -- a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100, and meeting the requirements of ASTM D 6751.

**Biodiesel blend**, n. -- a blend of biodiesel fuel meeting ASTM D 6751 with petroleum-based diesel fuel designated BXX, where XX is the volume percent of biodiesel.

## In Plain English

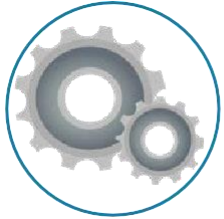
Biodiesel is a renewable, clean-burning diesel replacement fuel made from local feedstocks.

Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. Blends up to 20% can be used in existing diesel engines without modification.

# Why Choose Biodiesel?

## Biodiesel is a High-Performance Fuel

- Similar power & performance as ULSD
- High cetane provides quicker starts with less smoke
- Significantly enhances the lubricity of ULSD, reducing wear & prolonging engine life
- Detergency effect keeps injectors & fuel systems clean
- Using B20 with DPF filters results in longer intervals between regeneration, reducing fuel consumption (same MPG as ULSD)
- Less soot, reduced maintenance





## CITIES AREA TRANSIT • GRAND FORKS, ND

- High idle percentages create issues with emissions systems/DPF filters
  - B20 has helped address DPF filter plugging
    - **Major reduction of maintenance costs and down-time of equipment**
- Reduction in DEF use
- Oil samples are coming back cleaner
  - Reduction of ~30% to 40% in soot levels
- Slight MPG improvement

**PLUGGED DPF FILTER &  
EGR TUBE  
BEFORE BIODIESEL**



**DPF FILTER AFTER 6 MONTHS  
RUNNING BIODIESEL  
--NO ISSUES**



Photos provided by Cities Area Transit

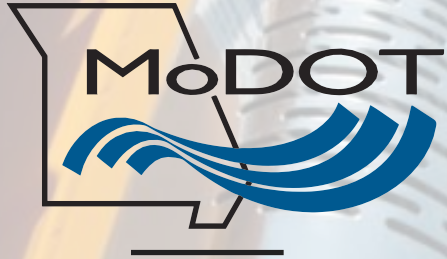
# Biodiesel Fleet

## St. Louis Lambert International Airport

- Began experimenting with biodiesel blends in the 1980s
- Began using B20 in 1990
- Cost savings:
  - Increased lubricity
  - Less cleaning and replacing of injectors
  - Fuel injector pumps last longer







- During the warm months of April through October, MoDOT utilizes a B20 biodiesel blend.
- MoDOT used more than 1 million gallons of B20 in FY21.

# Why Choose Biodiesel?

## DROP-IN FUEL



- Biodiesel is an ultra low sulfur fuel, meeting ULSD sulfur requirements
- B20 can be stored and dispensed through your existing diesel fuel system – no expensive infrastructure investment needed
- Biodiesel blends up to B20 can be used in existing diesel engines without modifications
  - **Use B20 with minimal to no added cost and no wait!**
- Like diesel fuel, biodiesel meets strict quality standards

**You May Have Heard**  
***“ 15 years ago I tried biodiesel  
and.....”***

# Biodiesel Meets Strict Quality Standards

## ASTM Biodiesel Specifications

**ASTM:** develops and publishes technical standards for fuels and other industries  
Active on biodiesel standards since 1993

**D975:** Petroleum diesel includes biodiesel blends up to 5% for on/off road engines. Physical properties of blends up to B5 are the same as ULSD. Blends up to B5 should be treated the same as No. 2 diesel (B0) and are used year-round throughout the US.

**D6751:** The approved specification for B100 used for blending up to B20, since 2001

- Performance-based
- Feedstock and process neutral
- Revised and updated in 2009 and 2012

**D7467:** Blends containing 6% to 20% biodiesel for on/off road engines

# Why Choose Biodiesel?

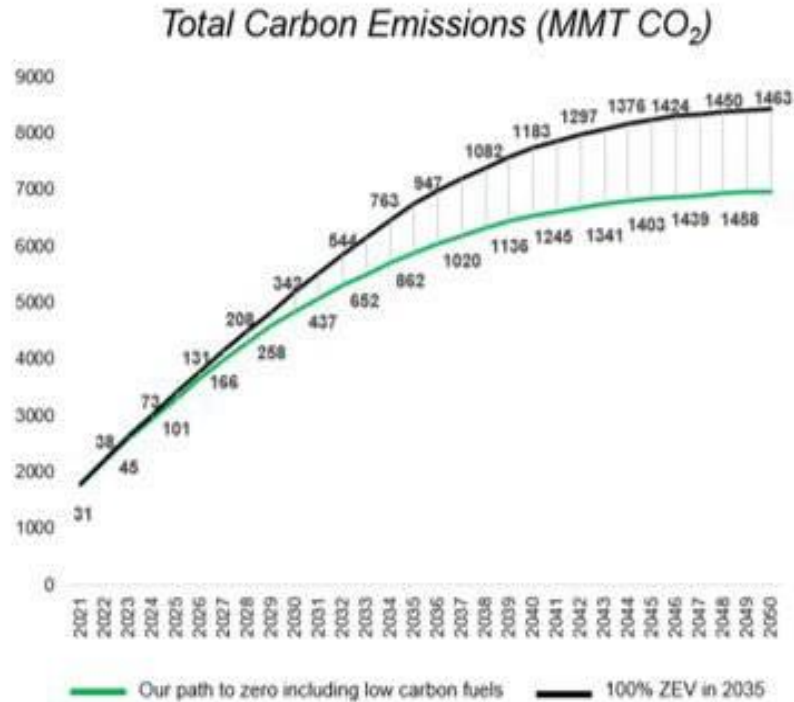


## Reduce Your Carbon Footprint

Biodiesel is an Advanced Biofuel: Reduces lifecycle greenhouse gas emissions by 50%+ compared to petroleum diesel

- **B100 reduces GHGs by up to 86%**
- **B20 blend reduces GHGs by 15%**
- **Made from renewable, local resource**

# More cumulative carbon reduction – Better, Cleaner, NOW!



# Health Benefits Study

Study conducted in 13 sites and communities in the U.S. that are regularly exposed to high rates of petroleum diesel pollution.

~National Biodiesel Board, in partnership with Trinity Consultants, 2021

In the transportation sector, benefits included a potential 45% reduction in cancer risk when heavy-duty trucks such as semis use B100 and 203,000 fewer or lessened asthma attacks.

# Common Biodiesel Myths



**MYTH: Biodiesel has a shorter shelf life than petroleum diesel**

**FACT:**

- As with ULSD, biodiesel without additives has a shelf life of 6 months.
- Biodiesel producers utilize stabilizing additives to prevent product degradation.
- With additives and proper housekeeping, the shelf life of biodiesel blends can be extended up to 2 years.



# Common Biodiesel Myths

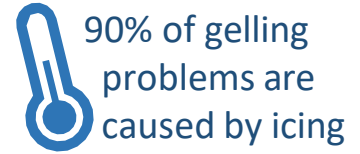


## Myth: Biodiesel causes microbial contamination

### Fact:

- Water in diesel fuel leads to microbial contamination.
- Prior to 2006 the sulfur in diesel fuel prevented growth of bacteria and fungus by acting as a natural anti-microbial.
- When sulfur was removed to meet ultra low sulfur diesel fuel requirements, this beneficial property was lost. Bacteria grows in the water-fuel interface.

# Common Biodiesel Myths



**MYTH: Biodiesel blends, even at low levels, cause fuel to gel**

**FACT:**

- What many diesel users describe as fuel “gelling” is icing. Water freezes at 32°F and below.
- When temperatures drop in the fall, diesel tank and vehicle owners may experience filter plugging when water that has collected on the fuel filter freezes, preventing flow of fuel through the filter.
- Prevent icing by keeping storage, vehicle and equipment tanks full to reduce condensation. Keep caps tight. Check for leaks.

# Check for Water

**Diesel fuel should be clear & bright.**

If fuel is clear and bright, no action is needed.



**Hazy fuel indicates water saturation.**

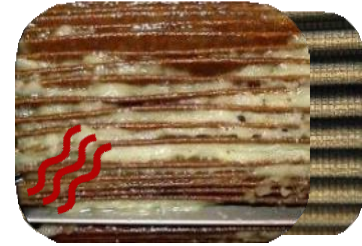
If fuel is hazy, monitor it regularly.

**Free water accelerates corrosion and fuel degradation.**

If visible layers appear, remove free water.



# Common Biodiesel Myths



**MYTH: When it's cold, biodiesel drops out of the fuel and plugs filters**

**FACT:**

- Once blended correctly, biodiesel and petroleum diesel do not separate.
- When the temperature of fuel is at or below its cloud point, paraffin wax (which is part of petroleum diesel) will precipitate out and collect on the bottom of the tank and then plug fuel filters.
- Paraffin melts back to liquid at room temperature.



## Best Practices

- Buy premium diesel or use an additive to prolong the shelf life of your fuel and prevent thermal oxidation.
- Buy biodiesel blends pre-blended by your supplier
- Keep storage, vehicle and equipment tanks topped off to eliminate head space which leads to condensation.
- Check hoses, fill/vapor caps, gaskets for leaks.
- In the fall before colder weather sets in, check tanks for water. Check again in the spring. Remove any free water.
- Install a 30-micron filter on the dispenser to accommodate the higher viscosity of fuel in winter.
- When using additives, make sure the fuel is at least 10 degrees above its cloud point.

# Integrating Biodiesel Into Your Fleet

Assistance from  
Biodiesel Coalition of  
Missouri and Missouri  
Soybean

- Review current system and procedures and provide recommendations for successful transition and use
- Develop a routine maintenance program and provide training to retrieve samples
- Conduct fuel quality testing on a regular basis to assure proper tank management and fuel quality
- Provide guidance on an ongoing basis for seasonal transitions
- Conduct staff training as needed
- MO Soybean and BCM will promote company as supporting renewable fuels and MO's agricultural community

# Biodiesel helps generate 4% decrease in price of diesel fuel

## Clean Fuels Releases New Study Demonstrating Lower Consumer Costs at the Pump

May 9, 2022, 08:43 AM

*Without current U.S. biodiesel and renewable diesel production, fuel prices would be 4% higher*

Today, Clean Fuels Alliance America released a new study, "[The Offsetting Impact of Expanded Biomass Based Diesel Production on Diesel Prices](#)," prepared by World Agricultural Economic and Environmental Services (WAEES). The study shows that U.S. production of biodiesel and renewable diesel consistently reduces distillate fuel prices by increasing the supply. As the production and availability of cleaner, better fuels grew over the last decade, the price impact increased to a 4% benefit in 2020 and 2021.

"Biodiesel and renewable diesel meet more than 6 percent of the nation's need for diesel fuel, and the industry increased production and supply even during the economic emergency of the last few years," said Kurt Kovarik, vice president of federal affairs for Clean Fuels. "With mounting inflation and environmental concerns, as well as the need to increase energy security and reduce reliance on oil from unstable countries, it's more important now than ever before to maintain U.S. biodiesel and renewable diesel production."

The WAEES study notes that even small changes in the supply of diesel fuel will result in relatively larger changes in the diesel fuel price.

"Today's study shows that U.S. biodiesel and renewable diesel production generates a 4 percent decrease in the price of diesel fuel," Kovarik continued. "At today's national average price for diesel fuel, the savings is equal to about 22 cents per gallon. That price benefit flows through the entire economy. Diesel fuel keeps essential items, like food and commodities, as well as other retail goods moving across the country. With the current shortage and cost of diesel fuel, a price increase associated with the reduction of biodiesel and renewable diesel production would be passed along to consumers in the costs of numerous indispensable items."

[Read the WAEES study.](#)

The U.S. biodiesel and renewable diesel industry supports 65,000 U.S. jobs and more than \$17 billion in economic activity each year. Every 100 million gallons of production supports 3,200 jobs and \$780 million in economic opportunity. Biodiesel production supports approximately 13 percent of the value of each U.S. bushel of soybeans.

# Infrastructure Grants and Legislation

Grants - Offset some of costs of infrastructure/storage/dispensers

State (MO Biofuels Infrastructure Incentive Program) – 75% cost-share for fleets

Federal (USDA Higher Blends Infrastructure Incentive Program) 50% cost –share for fleets

Legislative – Retail incentive – 2 cents B5-B10/5 cents B11 or higher



# B100 SYSTEM OVERVIEW – OPTIMUS TECHNOLOGIES

The Optimus system integrates into existing diesel engines. The technology never inhibits the use of diesel fuel but uses biodiesel for all operations outside of startup and shutdown which will always occur on diesel. The technology is fully automated requiring no driver interaction.



VECTOR  
FUEL  
TANK



USER  
INTERFACE



ELECTRONIC  
CONTROL  
UNIT



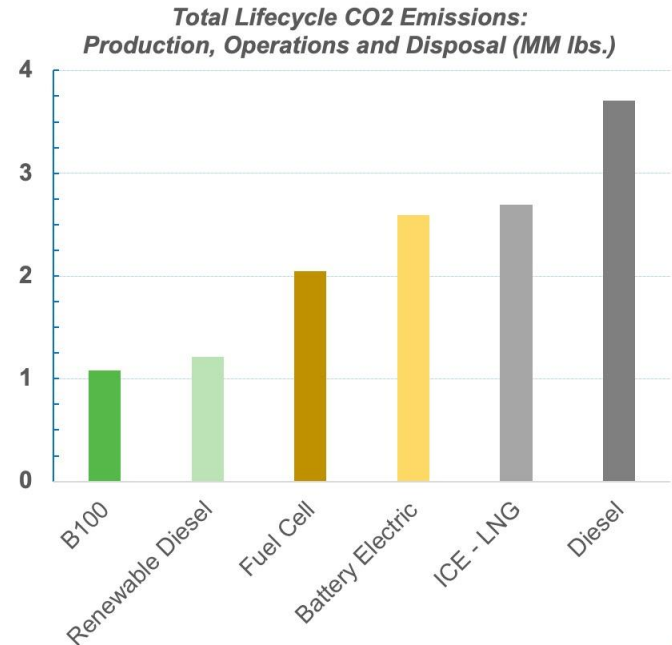
VECTOR  
MANIFOLD

*\*Patented*

University of Missouri

# THE LOWEST CO<sub>2</sub> OPTION & AVAILABLE TODAY

*If a class 8 truck powered by 100% biodiesel is replaced with a BEV, the net carbon emissions output as a result would be increased by **2.5x**.*



# ADM/Optimus Study

- 16-month field test equipping Class 8 Mack trucks with Optimus Technologies Vector System.
  - 5 trucks B100 vs. 5 trucks conventional
- 
- ✓ 940 metric tons of Scope 1 emissions reduction
  - ✓ Slight increase in fuel economy
  - ✓ Reduction in ash accumulation in DPF
  - ✓ Overall reduction in total # of DPF regenerations
  - ✓ No negative engine oil impacts
  - ✓ No variation in maintenance costs observed
  - ✓ ADM Trucking operations were not impacted, and drivers reported positive results with deployment of system

## IMMEDIATE DECARBONIZATION OF CLASS 8 TRUCKING

A 1.3 Million Mile Evaluation of 100% Biodiesel



MISSOURIBIODIESEL.ORG



# Benefits

High  
Performance

Drop-in fuel &  
Available NOW

Reduce carbon  
emissions/Cleaner  
air

Domestically  
produced

Energy Security

Cost competitive



**Matt Amick**

Executive Director

(573) 690-8102

[mamick@mosoy.org](mailto:mamick@mosoy.org)



MISSOURIBIODIESEL.ORG

