



***The Soybean Checkoff ...
Progress Powered by Kansas Farmers***

To: House Committee on Agriculture
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Re: Kansas Biodiesel

HISTORY

The United States biodiesel industry is essentially 20 years behind the ethanol industry in its development timeline.

The ethanol industry started in the 1970s during the US energy crisis while biodiesel got its start in the early 1990s, primarily in response to the clean air act and energy policy act.

Though late to commercialize biodiesel in the US, vegetable oil producers have long known the potential of their product in industrial applications, all the way back to Rudolph Diesel inventing the engine that bears his name in the late 1890s. His first demonstrations ran solely on peanut oil.

A massive glut of soybean oil in the US in the late 1980s and early 1990s was a significant drag on soybean prices. Edible soy oil markets couldn't keep up with the demand for protein meal needed to feed livestock. The fixed ratio of meal to oil in soybeans and these market dynamics led a group of soybean farmer leaders in Missouri to begin to research opportunities for industrial or fuel uses for the oil.

What they found out through that early 1990s research is that if you remove the glycerin from these triglycerides, the end product is very similar to diesel fuel that performs in a diesel engine. Since it contained no carbon, it also had the advantage of being cleaner burning and was obviously renewable and grown by farmers every year.

Since that time, soybean farmers have spent tens of millions of dollars through state and national checkoff programs proving that the fuel works in all types of diesel engine applications and verifying the emissions from the fuel are carbon free and fits into the current clean air provisions as they are revised.

Once farmers started this process, they realized they could expand their support base by including other fats and oils in the biodiesel industry, like used cooking oils from restaurants (often soybean oil originally), canola oil, corn oil, beef tallow, pork lard, chicken fat, and any other fat or oil.

When things really took off with the passage of the federal Renewable Fuel Standard (RFS) & tax incentives in the early 2000s we started getting more interest in production facilities nationally, and in Kansas. As facilities across the country were constructed, specifically concentrated in the Midwest and on the coasts first, Kansas saw interest in development of production facilities as we are close in proximity to key feedstocks. There was talk of one in Emporia that never came to fruition, there was one in Cottonwood Falls, but the most successful early production facility was in Minneola with Emergent Green Energy. From there, Cargill was the next plant and Seaboard Energy will be coming on board in addition to what they produce from products raised at their plants in Guymon, Okla. and St. Joseph, Mo. Cargill and AGP also have plants just across the Missouri boarder, utilizing many Kansas products.

Nationally, the biodiesel and renewable diesel market nearly eclipsed three billion gallons in 2020, utilizing more than 8.5 billion pounds of US soybean oil. With the future growth in markets for low-carbon fuels, the National Biodiesel Board estimates the national market will grow to six billion gallons by 2030 and 15 billion gallons by 2050. Continuing to provide a significant market for fats and oils and return on investment for soybean farmers across the country.

Even though biodiesel production in Kansas is somewhat limited currently, the impact this market for Kansas soybean oil provides remains significant.

GENERAL FACTS

- Increased demand for biodiesel boosts demand for soybean oil and brings additional value to Kansas soybeans.
- Biodiesel adds more than 63 cents of value to every bushel of soybeans sold.
- More than 50% of biodiesel is made from soybean oil nationally, with the remainder coming from other agricultural products like animal fats, corn oil, and recycled cooking oil.
- For every unit of fossil-energy it takes to produce biodiesel, 3.5 units of renewable energy is returned.
- Biodiesel reduces lifecycle greenhouse gas emissions by as much as 85%, making it an attractive option in low carbon fuel markets.
- The US biodiesel industry supports more than 64,000 jobs and \$12 billion in economic impact.

Soybeans can be crushed for both meal and oil.

- Approximately 80% of a soybean is meal, 20% is oil.
- 1 bushel of soybeans produces 1.5 gallons of biodiesel & 48 pounds of soybean meal.
- Increased demand for soybean oil to make biodiesel increases the supply of soybean meal that can be used to make animal feed. The increased supply of meal leads to lower feed prices for livestock and poultry farmers.

KS Soybean Infrastructure Investments:

- Victory Renewables – Conestoga Fuel Services in Garden City
- Magellan in Kansas City, Kansas – In progress
*Helped them to set up fueling distribution station to store biodiesel and blend with diesel.

THE NEXT PHASE

The foundation for the biodiesel industry was laid by soybean farmers and national policy, while the future growth is expected to be driven by state and regional policy. We've already seen this beginning to take shape, primarily driven by carbon reduction policy and goals. While different regions have approached it in different ways, the end result is the same – much more low-carbon biodiesel and renewable diesel in our fuel supply going into the future.

West Coast

California, Washington, and Oregon all have low carbon fuel standard policies in place that are driving significant biodiesel growth. This program scores fuels with the status quo – petroleum – as the baseline. A fuel that is less carbon intensive generates credits, while fuel used in the market that is higher than the baseline creates a deficit. Biodiesel's Carbon Intensity score is 50-85% better than petroleum. As overall reduction targets ratchet lower each year, biodiesel volumes grow – more than a billion gallons in California alone this year. Also worth noting, between biodiesel and renewable diesel, nearly a quarter of the entire diesel fuel used in the state of California was renewable, low-carbon fuel in 2020.

East Coast – Bioheat

On the East Coast, the primary driver is the home heating oil industry. Biodiesel in heating oil, termed Bioheat®, uses hundreds of millions of gallons of biodiesel each winter. Due to infrastructure and other constraints due to population density in the region, there are few cost-effective options for removing carbon from heating homes in the region. The easiest being, providing customers with a cleaner fuel. The national and various individual state heating associations have made a commitment to transition to net-zero emissions by 2050 with their primary solution being Bioheat®. If successful, this market could be a 4 billion gallon a year market alone.

Midwest

Closer to home here in the Midwest, we've seen several states support the industry through various means. Minnesota enacted landmark legislation in 2005 for a first-in-the-nation 2% biodiesel fuel standard. This gradually over the years moved up to a B20 (20%) statewide fuel standard starting in May of 2018.

Illinois has chosen to incentivize biodiesel use on-road by waiving the fuel sales tax on the full gallon if it contains more than 10% biodiesel. Essentially making standard diesel fuel across the state B11.

Iowa is considered by some the shining star of state biodiesel policy with a 2cts/gallon production credit, a 3.5 cts/gallon retailer credit on B5, a 5.5 cts/gallon retailer credit on B11+, and a fuel tax differential for B11 and higher blends, along with a statewide renewable fuels infrastructure program of \$3 million dollars annually for biodiesel and ethanol. All of this support has led to nearly a dozen operating plants in the state and the highest production volume in the country. Also, half of all diesel fuel in Iowa contains some level of biodiesel blend today.

And just next door, Missouri has had a number of policies over the years but is currently working towards a statewide standard similar to Minnesota. The proposal would begin with B10 and move up to B20.

And the last policy I will mention specifically is to our West, Colorado is exploring low carbon fuel policy structured more like we see in California. Colorado's diesel market is large enough that if they reached B20 across the board it is potentially a 200-million-gallon biodiesel market.

We are excited about where the national market for biodiesel and renewable diesel are headed, from 3 billion gallons currently towards 15 billion gallons by 2050. Soybean farmers have been the foundation of the industry in its infancy but all of agriculture benefits, and should be on board for this future of growth.

KSC OUTREACH & EDUCATION PROGRAMS

- MEG Corp
 - Diesel Mechanic Schools
 - Visits diesel mechanics schools throughout the state to train them before they enter the industry
 - Fuel Testing
 - Does testing on biodiesel quantities as well as diagnosis of fuel issues as-needed
- Kansas Biodiesel Consortium
 - Made up of faculty and students, this group makes and works with fuel on the university level to equip future generations with biodiesel experiences.
 - This group does outreach to fuel retailers and users, including KDOT
 - University of Kansas
 - Kansas State University
 - Seward County Community College
 - North Central Technical College
- Clean Cities- Kansas City and Central Kansas
 - Regional arm of the national DOE program designed to reduce petroleum consumption
 - General consumer and fleet operations outreach
- Kansas Department of Transportation
 - Standalone and in conjunction with Kansas Biodiesel Consortium, connect and provide information and education

Network with/members of/support provided for:

- National Biodiesel Board
- Renew Kansas- member
- Fuel True: Independent Energy & Convenience
- Kansas Motor Carriers Association
- Kansas Association of Counties
- Kansas Association of School Boards
- Kansas State Pupil Transportation Association

STATE LAW

- 30 cent per gallon production tax incentive in Kansas (no funds appropriated).

- The law requires KDOT to use B10 if the price is no more than 10 cents per gallon higher than diesel fuel.

PLANTS AND FUEL STATIONS

Biodiesel Plants:

- Cargill, Wichita- 60 million gallons

Renewable Diesel Plants:

- East Kansas AgriEnergy, Garnett- 4 million gallons
- Under Construction- Seaboard Energy, Hugoton- 85 million gallons- 2022 opening

Biodiesel Plants just across the borders, utilizing Kansas inputs:

- Cargill, Kansas City, MO- 40 million gallons
- AGP, St. Joe, MO- 30 million gallons
- Seaboard Energy, St. Joe, MO- 30 million gallons
- ADM, Deerfield, MO- 50 million gallons
- Seaboard Energy, Guymon, OK- 45 million gallons (primarily choice white grease)

Refineries in Kansas Blending Biodiesel:

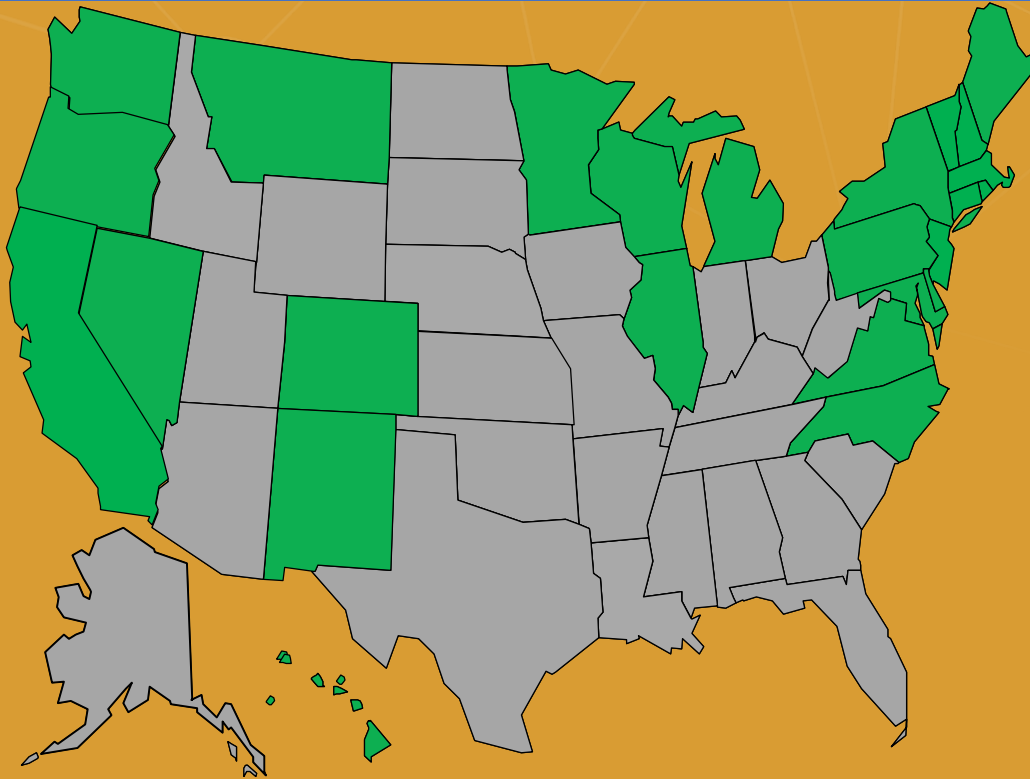
- Coffeyville Resources LLC
- CHS Refinery- McPherson
- HollyFrontier- El Dorado

*To comply with the Renewable Fuel Standard (RFS), refineries blend B5

Fuel Stations that have worked with the Kansas Soybean Commission in Advertising Biodiesel Blends:

- 24/7 Travel Stores- based in Kansas
- Love's Travel Stop
- Newell Truck Plaza- Newton, KS
- Additional stations and brands carry biodiesel blends regularly. Most often found is blends of B5 or lower where it is not required to be labeled. However, many of the large truck stop brands carry higher blends seasonally, which do include pump labels.

Comprehensive Carbon Goals



Most Common Goals:

- 40% by 2030
- 80% by 2050

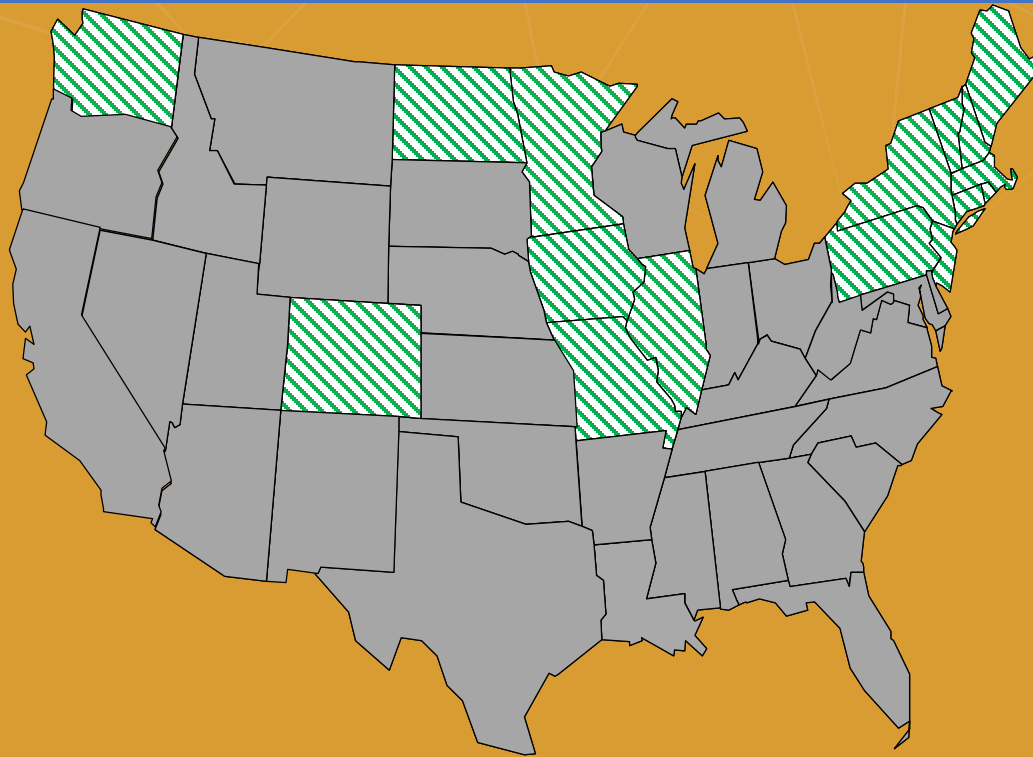
>50% U.S. population

>50% U.S. GDP

>40% of on-road fuel

>90% of heating oil

Emerging Markets



Washington
Colorado
Midwest
Northeast

Washington



GHG Reduction Targets

45% by 2030
70% by 2040
95% by 2050

Key Stats

Diesel use: 940M gallons
Potential B20: 190M gallons

Incentives

Ag use exempted from
sales/use tax

Blending & Other Standards

B2 (potentially up to B5)

Northeast



GHG Reduction Targets	Key Stats
30% - 40% by 2030 80% - 85% by 2050	Diesel use: 3.73B gallons (heating), 5.1B gallons (transportation) Potential B20: 1.8B gal

Incentives	Blending & Other Standards
<ul style="list-style-type: none">8% discount on high BD blends (ME)Various tax exemptions (NY, NJ, RI, CT)	B5 (NY, RI)

New York



GHG Reduction Targets	Key Stats
40% by 2030 85% by 2050	Diesel use: 1.04B gallons (heating), 1.4B gallons (transportation) Potential B20: 490M gal

Incentives	Blending & Other Standards
<ul style="list-style-type: none">1 cpg BD content tax credit (residential bioheat)e.g. B5 = 5 cpg, B20 = 20cpg (cap)BD portion exempt from certain taxes (to 8/31/21)	B5 (home heating in Nassau, Suffolk, Westchester counties)

Midwest



GHG Reduction Targets

30% by 2025 (MN)
80% by 2050 (MN)

Key Stats

Diesel use: 2.1B gallons

Potential B20: 415M gallons

Incentives

- 5 cpg on B5+ (ND)
- 3 cpg road tax diff. + 3.5 cpg on B5, 5.5 cpg on B11 (IA)
- Exemption of 6.25% on B11+ (IL)

Blending & Other Standards

B10/B20 (MN)

Iowa



Incentives	Infrastructure
<ul style="list-style-type: none">• 2 CPG Production Credit (CAPPED)• Biodiesel Retailer Credit B5 = 3.5 CPG B11+ = 5.5 CPG• Fuel Tax Differential 3-cent differential for B11 or higher	<p>Renewable Fuels Infrastructure Program</p> <ul style="list-style-type: none">• \$3 million+ annually for biodiesel and ethanol

Colorado



GHG Reduction Targets	Key Stats
26% by 2025 50% by 2030 90% by 2050	Diesel use: 920M gallons Potential B20: 180M gallons

Incentives	Blending & Other Standards
---	B20 for State fleet

Benefits of Biodiesel



In 2020
the U.S. biodiesel market
was **2.9 billion gallons**

The biodiesel industry
 supports **64,000**
American jobs

For every 100 million gallons of
biodiesel produced – the industry
creates **3,200** jobs

8% of biodiesel is made
from animal fats




Chicken fat, beef tallow & pork
lard are three major sources of
commercial animal fats



There are **1,689** retail
locations where biodiesel blends
are available


1 bushel of
soybeans
produces 1.5
gallons of
biodiesel & 48
pounds of
soybean meal



 Biodiesel is the **1st** commercially
available advanced fuel

Biodiesel reduces lifecycle greenhouse
gases by **86%** percent



 For every unit of fossil energy it takes to
produce biodiesel, **3.5** units of
renewable energy are produced

Biodiesel lowers particulate matter
by **47%**, reduces smog and makes
our air healthier to breathe



Animal agriculture is
the **#1** consumer
of soybeans



As biodiesel
production increases

soybean meal
prices decrease

57%
of biodiesel is made
from soybean oil

