

Growing Opportunities: Biobased Fuels

2026 GREEN DRIVES CONFERENCE & EXPO



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About Us



- Founded in 2014, the **B20 Club of Illinois** is a partnership between the **Illinois Soybean Association Checkoff Program** and **American Lung Association** that recognizes and supports Illinois fleets and organizations with strong support for the production and use of biodiesel, with an emphasis on biodiesel blends of B20 or higher.
- We partner with fleet operators, biofuel producers, fuel marketers, OEMs, and stakeholders to promote and advance the use of drop-in, low-carbon biobased products and biomass-based diesel fuels, including biodiesel, renewable diesel, and sustainable aviation fuel.

B20 Club Members, Providers, & Partners



Diverse Equipment Using B20-B100



- Ambulances
- Asphalt Equipment
- ATVs
- Backhoes
- Backup Generators
- Bucket Trucks
- Bulldozers
- Cement Trucks
- Combines
- Crains
- Emergency Water Pumps
- Excavators
- Fire Engines
- Forestry Equipment
- Fuel Delivery Vehicles
- Graders
- Locomotives/Rail
- Marine Vessels
- Mowers
- Plow Trucks
- Refuse Haulers
- School Buses
- Street Sweepers
- Tow Trucks
- Tractors
- Tractor-Trailers
- Transit Buses
- Turf Cleaners
- UTVs
- Vacuum Trucks



Introduction to Biodiesel

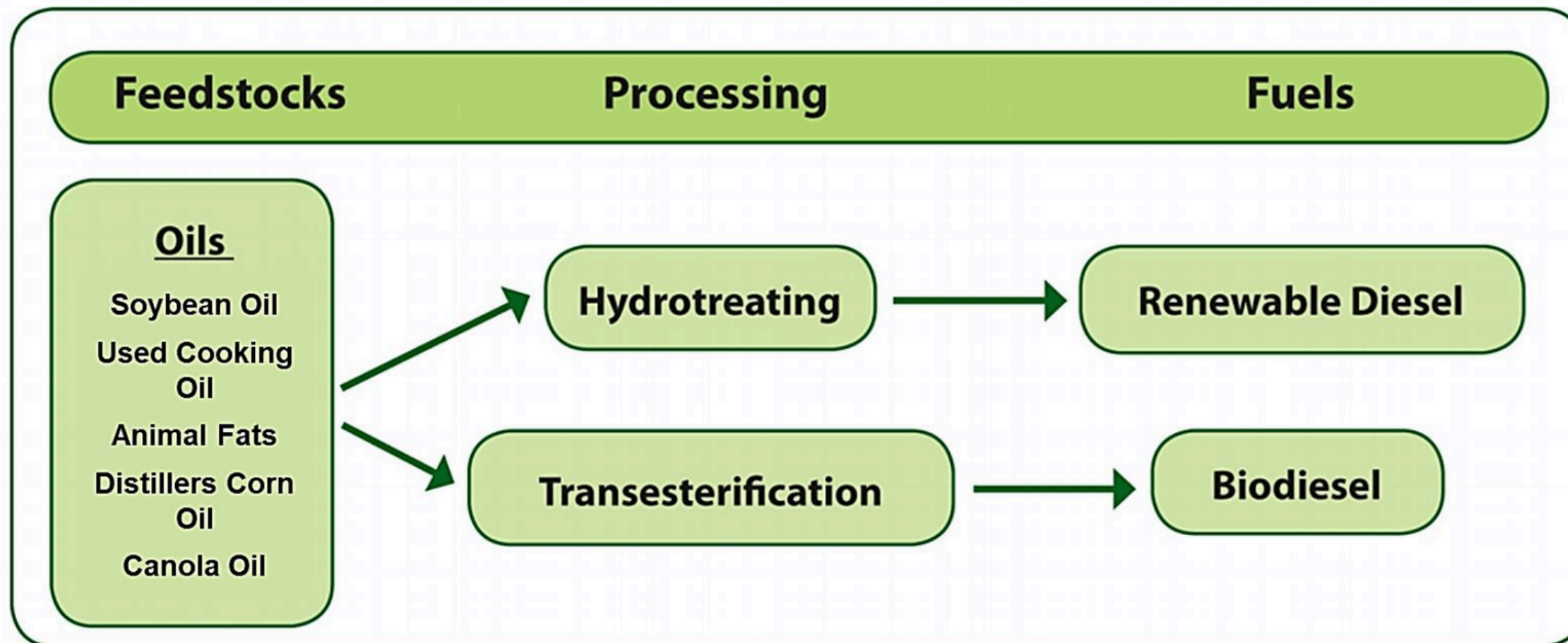
What Is Biodiesel?



- Biodiesel is a renewable, non-toxic alternative to petroleum diesel fuel, produced from oils and fats through transesterification, and meeting ASTM D6751.
- Biodiesel blends are identified by a “B” followed by the blend percentage (ex. B20 = 20% biodiesel).
- Blends up to B5 meet ASTM D975, the specification for diesel fuel.
- Blends of B6-B20 meet ASTM D7467.
- Blends of B21-B99 require the diesel to meet ASTM D975 and the biodiesel to meet ASTM D6751. A separate spec is under development because of growing interest/demand.
- B100 meets ASTM D6751.

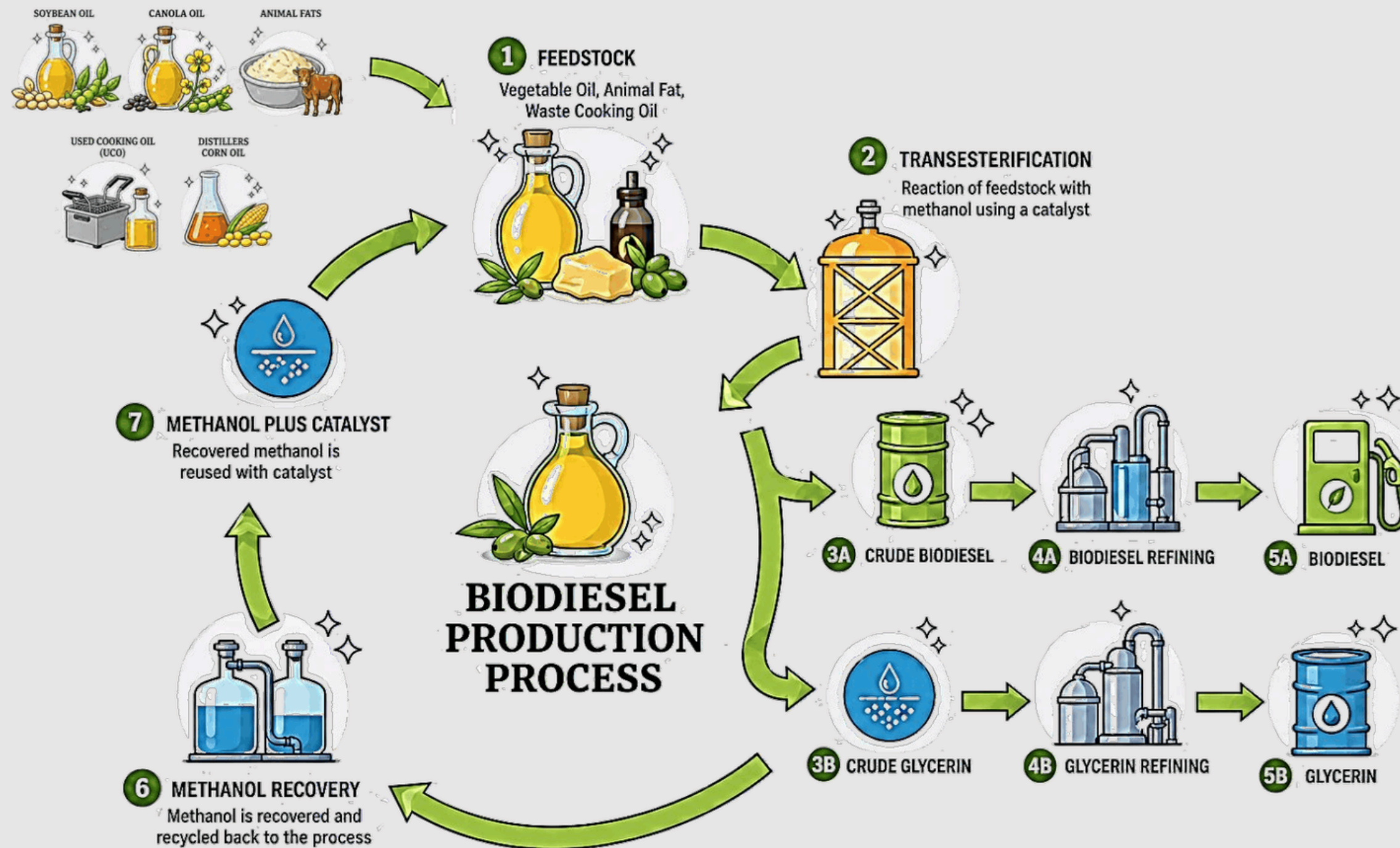
Biodiesel Is NOT Renewable Diesel

While made from the same feedstocks, biodiesel and renewable diesel are two distinct fuels produced through different refining processes.



*Based on graphics provided by the United States Department of Energy and the Diesel Technology Forum

How Is Biodiesel Produced?



- For every unit of energy used to produce biodiesel, between 2.5 and 5.5 units of renewable energy are returned.
- Reduces lifecycle carbon emissions by 74% on average.
- Reduces wastewater generation by ~79%
- Reduces hazardous waste by ~96%
- Recovery of ~90% of methanol

Where is Biodiesel Produced?



Biodiesel Plants and Feedstocks in Illinois

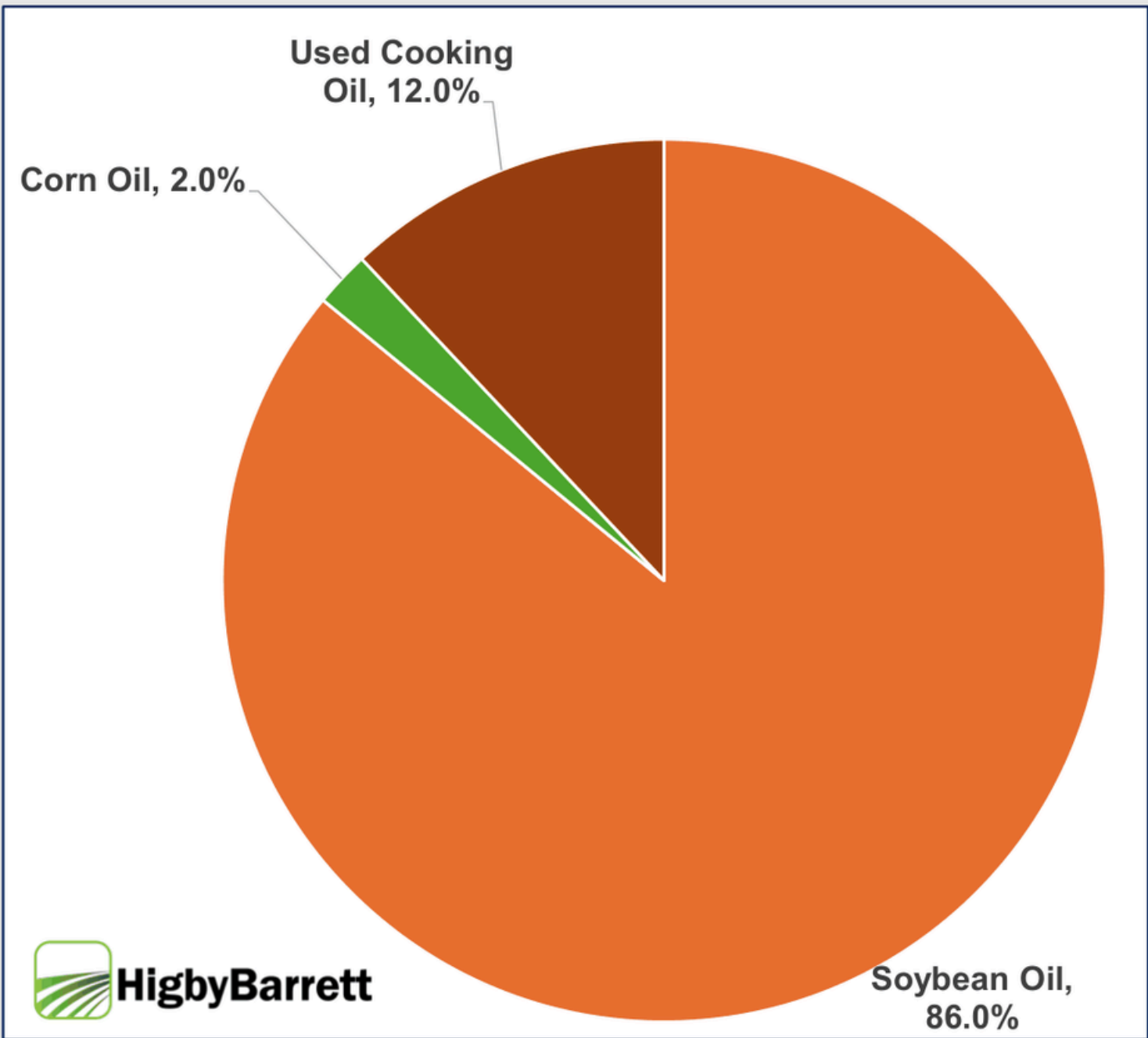
- Four (4) commercial biodiesel plants in Illinois
- One (1) small-scale research plant at Loyola University
- Soybean oil is the leading feedstock (oil/fat) at 86%
- 176 million gallons of biodiesel produced in 2024
- 196.1 million production (effective capacity) in 2024
- Expanding up to 250 million gallons by 2028*
- ~2 billion gallons of biodiesel produced in the U.S. annually

Illinois Biodiesel Plant List

Name	Location	Feedstock	Name Plate Capacity (MMgy)	Listed Effective Capacity (MMgy)
Adkins Energy Biodiesel	IL	Corn Oil	4	4
Incobrasa Industries, Ltd.	IL	Soybean Oil	62	62
Loyola University Chicago	IL	Research (UCO)	0.1	0.1
REG Danville, LLC (Chevron)	IL	Soybean Oil and UCO	45	50
REG Seneca, LLC (Chevron)	IL	Soybean Oil and UCO	60	80
Total			171.1	196.1

Source: Higby Barrett, EIA, and Indigenous Energy

Feedstocks by Percentage



Source: Higby Barrett; Indigenous Energy

Food & Fuel Production in Illinois

- Illinois is the #1 soybean producing state, harvesting 639.3 million bushels of soybeans in 2025.
- We grow soybeans for the protein content and have historically had an excess quantity of soybean oil.
- 1 bushel of soybeans produces 1.5 gallons of biodiesel and 47 pounds of protein-rich meal.
- ~10% of soybean oil is used for food.
- ~10% of soybean oil is used for fuel production.



Food & Fuel Production Expanding in Illinois

- Incobrasa is expanding biodiesel production capacity from 75 million gallons to as much as 150 million gallons per year.
- Simultaneously producing up to 4.7 billion pounds of soybean meal per year.
- Increasing cooking oil production from 7 million bottles to 11 million bottles per month.
- Adding a new 5 megawatt (MW) solar array – enough to power up to 700 homes in the U.S. – further decarbonizing operations.

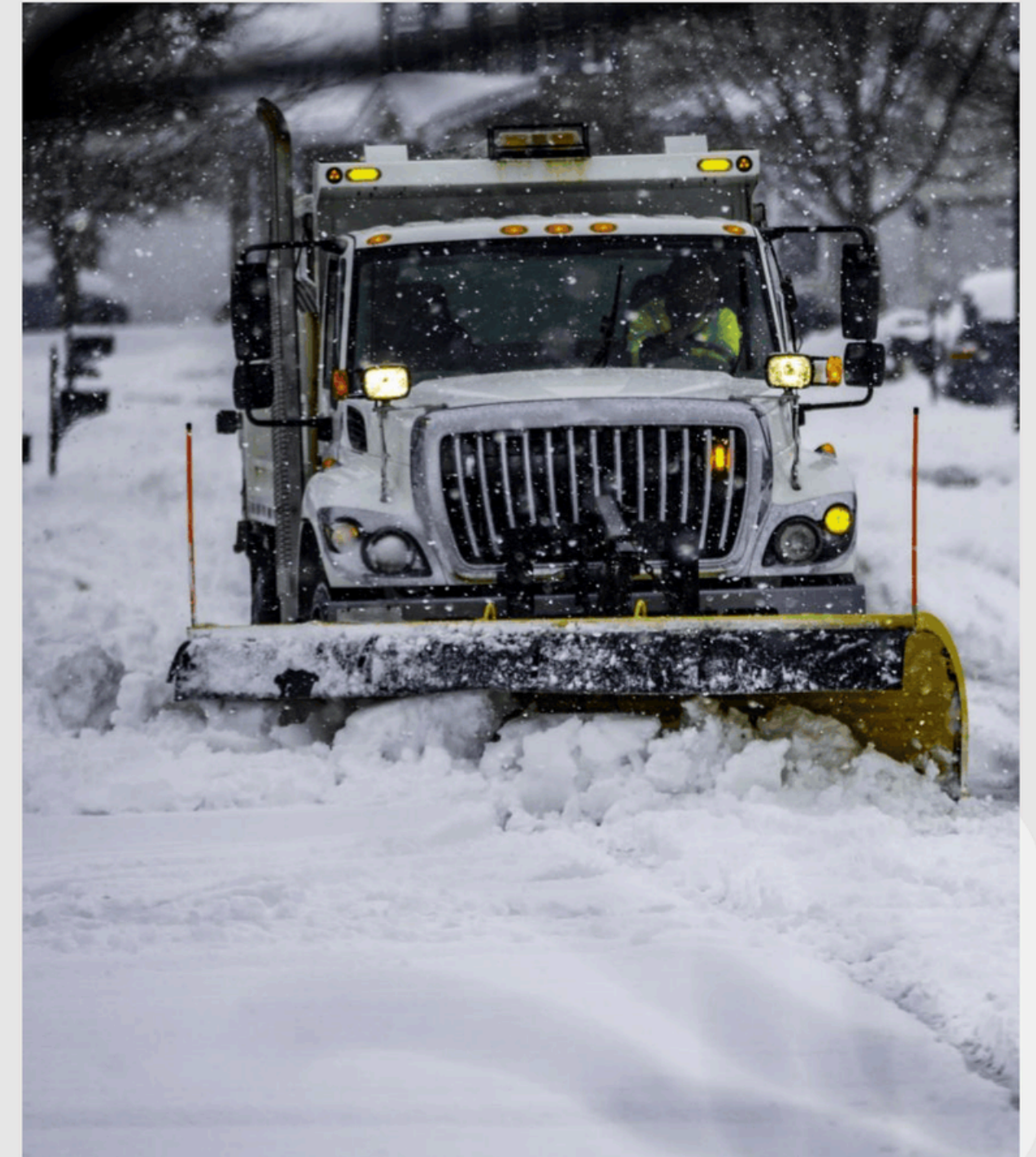




Biodiesel Consumption in Illinois

Illinois Public Fleet Standard (IPFS)

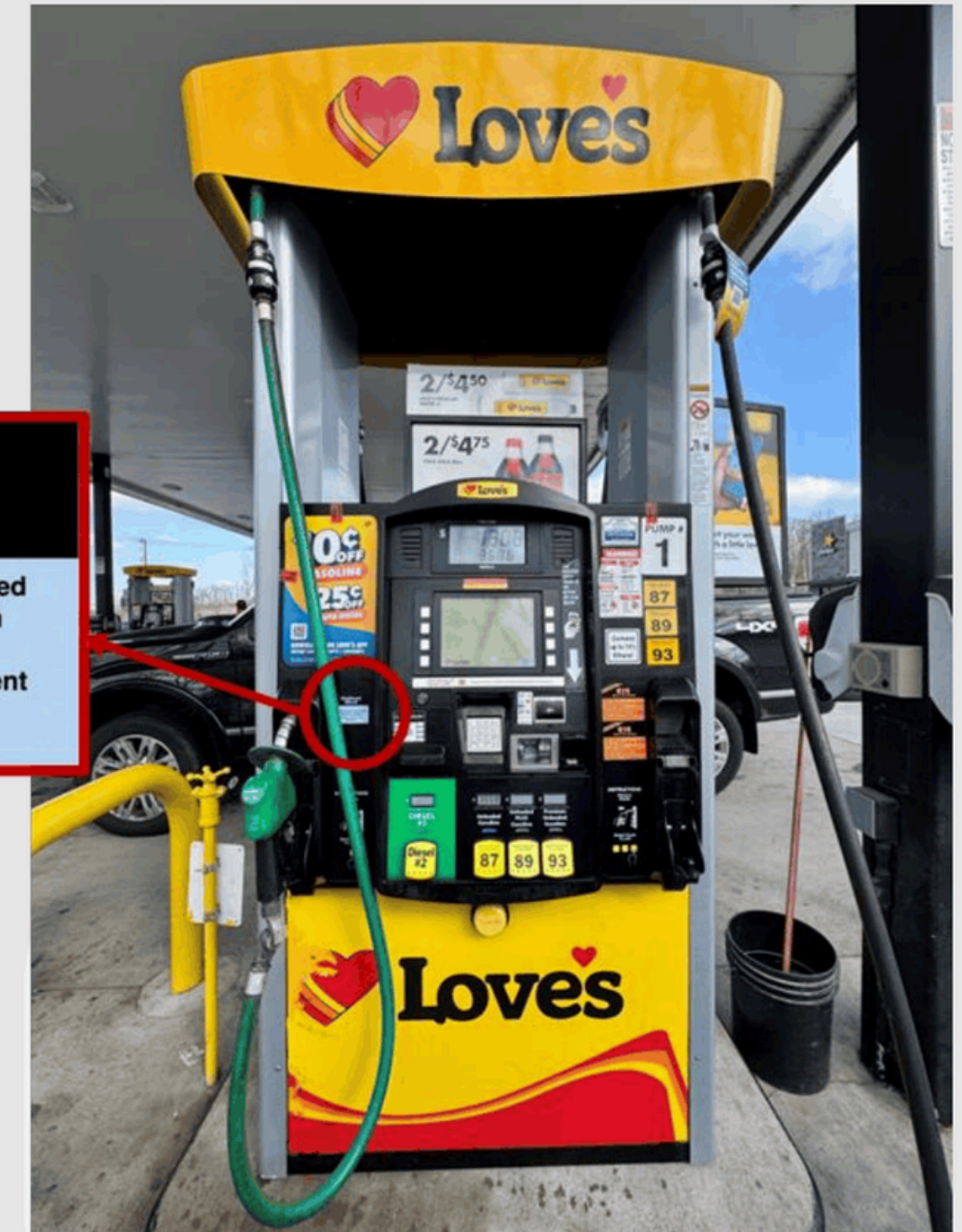
- First signed into law in 2005.
- Any diesel-powered vehicle owned or operated by the state, county, or local government, school district, community college, public college, university, or mass transit agency must use a biodiesel blend that contains at least 5% biodiesel (B5) when fueling at a bulk central fueling facility unless the vehicle engine is designed or retrofitted to operate on a higher blend of biodiesel or on ultra-low sulfur diesel (ULSD).*
- *ASTM D975 standard for ULSD includes biodiesel blends up to B5 biodiesel. There is no technical difference between B0 & B5.
- *Many OEMs design their equipment to run on biodiesel blends up to B20. Some approve even higher blends.
- There's interest in updating the language of the standard to enhance the blend and clarify the requirements.



Illinois Biodiesel Sales Tax Incentive (IBTI)

- Provides a **full exemption from the 6.25% sales tax** for biodiesel and renewable diesel blends that meet or exceed statutory blend percentages of **>19%**.
- The value of the credit is calculated based on the average price every 6 months. **The value was 17¢ per gallon effective January 1-June 30, 2026.** Value expected to top 30¢ per gallon when the average is updated in July 1.
- **April 1, 2026 – November 30, 2026-30: Blends above 19% (B20)**
- Allows for blends above 10% (B11) from December through March of the following year for fleets and operators concerned about winter operations.

Biodiesel Blend
contains biomass-based diesel or biodiesel in quantities between 5 percent and 20 percent



Illinois Biodiesel Incentive

- Average blend for 2023 was 12.28%
- Average blend for 2024 was 13.8%
- Average blend for 2025 was 15.03%
- Based on third-party testing and analysis, B11-B20 is sold year-round at 80-90% of retail sites in Illinois.
- Fleets in Illinois regularly use B11-B20 year-round – even in subzero temps.



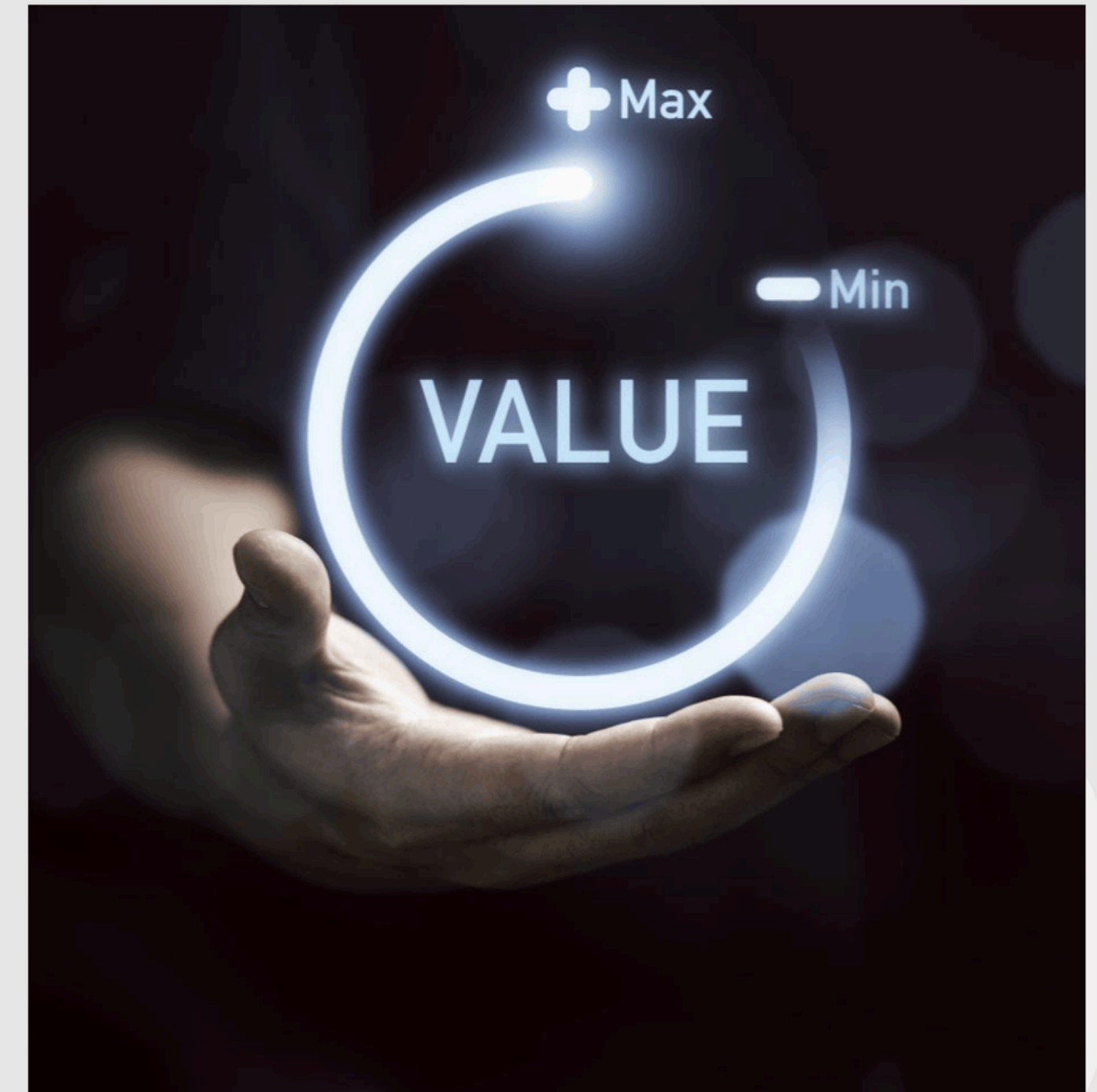
Economic Benefits

Illinois Biodiesel Industry

- Contributes to **\$2.3 billion** in business revenues to Illinois.
- Adds **\$647.6 million** to the State Value Added (GDP).
- The Illinois biodiesel industry **supports 3,228 jobs**, with 2,062 of those jobs directly supported by the IBTI.

Biobased Diesel Industry

- Contributes **\$42.4 billion** in total economic activity.
- **Supports 107,400 jobs** nationwide, with \$6 billion paid in annual wages.



Why Fleets Choose Biodiesel



Why Biodiesel?

- **Performance Benefits**

- Higher cetane compared to petroleum
- Higher lubricity compared to petroleum and renewable diesel
- Similar or improved MPGs
- Can improve DPF longevity
- Can extend DPF regen intervals

- **Health & Environmental Benefits**

- Lowers tailpipe emissions
- Improves local air quality
- Lower emissions improve public health
- Shrinks carbon emissions
- Readily Biodegradable
- Non-toxic

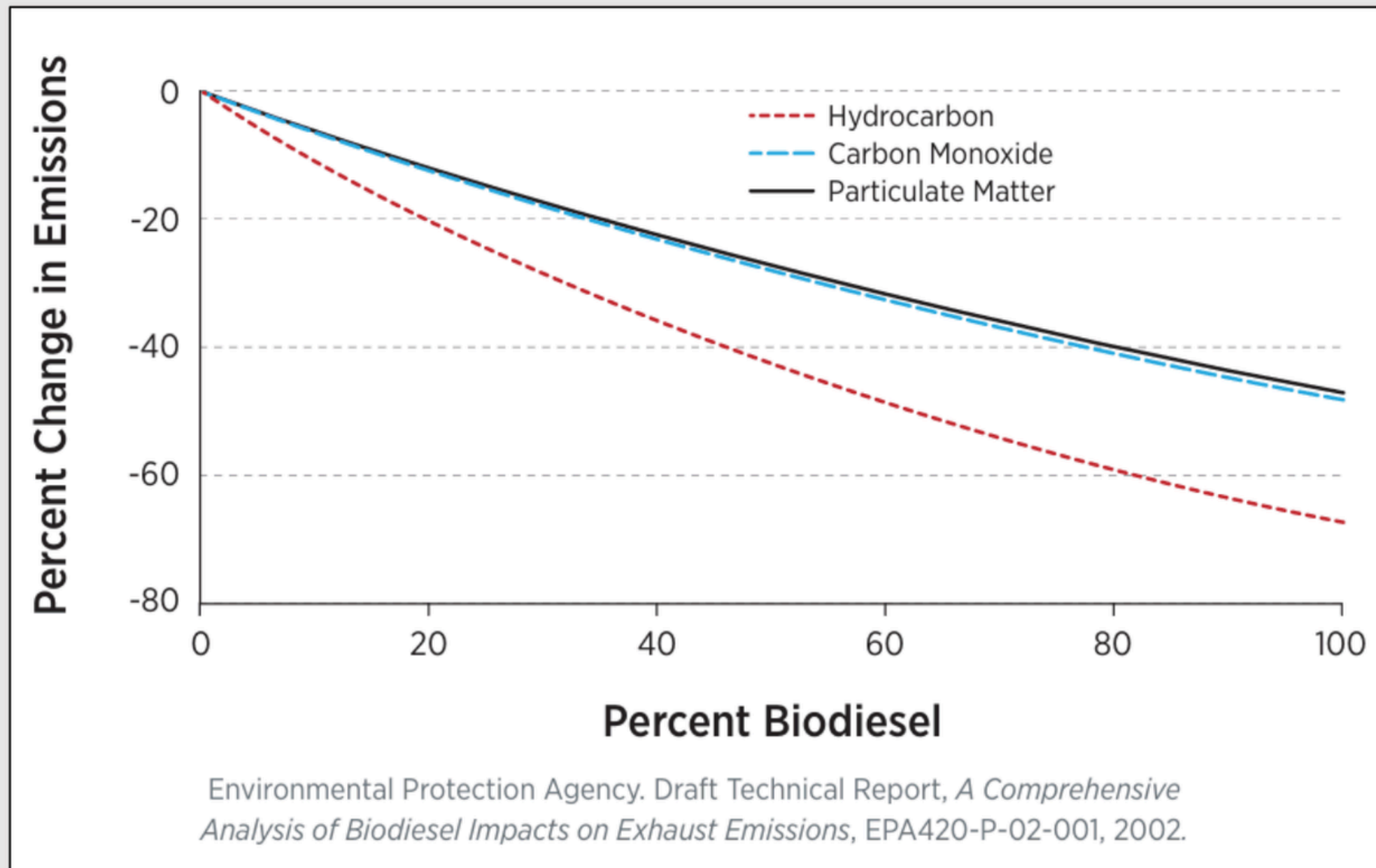
- **Energy & National Security**

- Lowers reliance on petroleum imports
- Extends domestic fuel supplies
- Provides an alternative during times of crisis
- Secure supply chain
- Positive energy return (1:2.5-5.5)

- **Economic Benefits**

- Lower or neutral cost fuel
- Produced domestically
- Supports farmers and the ag economy
- Supports local businesses and growth
- Turns waste into fuel (UCO, animal fats, etc.)
- Industry supports 107,000 jobs

Biodiesel Tailpipe Emission Reductions



BIODIESEL EMISSIONS REDUCTIONS

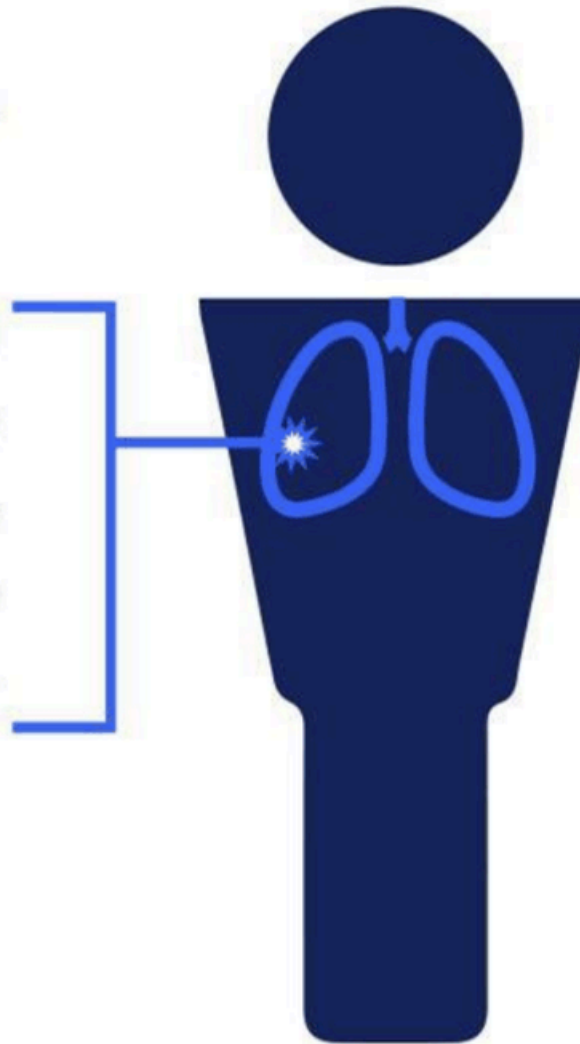
Emissions	B100	B20
CARBON MONOXIDE	-43.2%	-12.6%
HYDROCARBONS	-56.3%	-11.0%
PARTICULATES	-55.4%	-18.0%
AIR TOXICS	-60% - 90%	-12% - 20%
MUTAGENICITY	-80% - 90%	-20%

Mutagenicity is the capacity of a physical, chemical, or biological agent (mutagen) to permanently alter an organism's genetic material (DNA), causing mutations.

Air Pollution & Health

Respiratory

Wheezing and coughing
Shortness of breath
Asthma attacks
Worsening COPD
Lung cancer



Other

Premature death
Susceptibility to infections
Heart attacks and strokes
Impaired cognitive functioning
Metabolic disorders
Preterm births and low birth weight

Carbon Is An Unwanted Guest

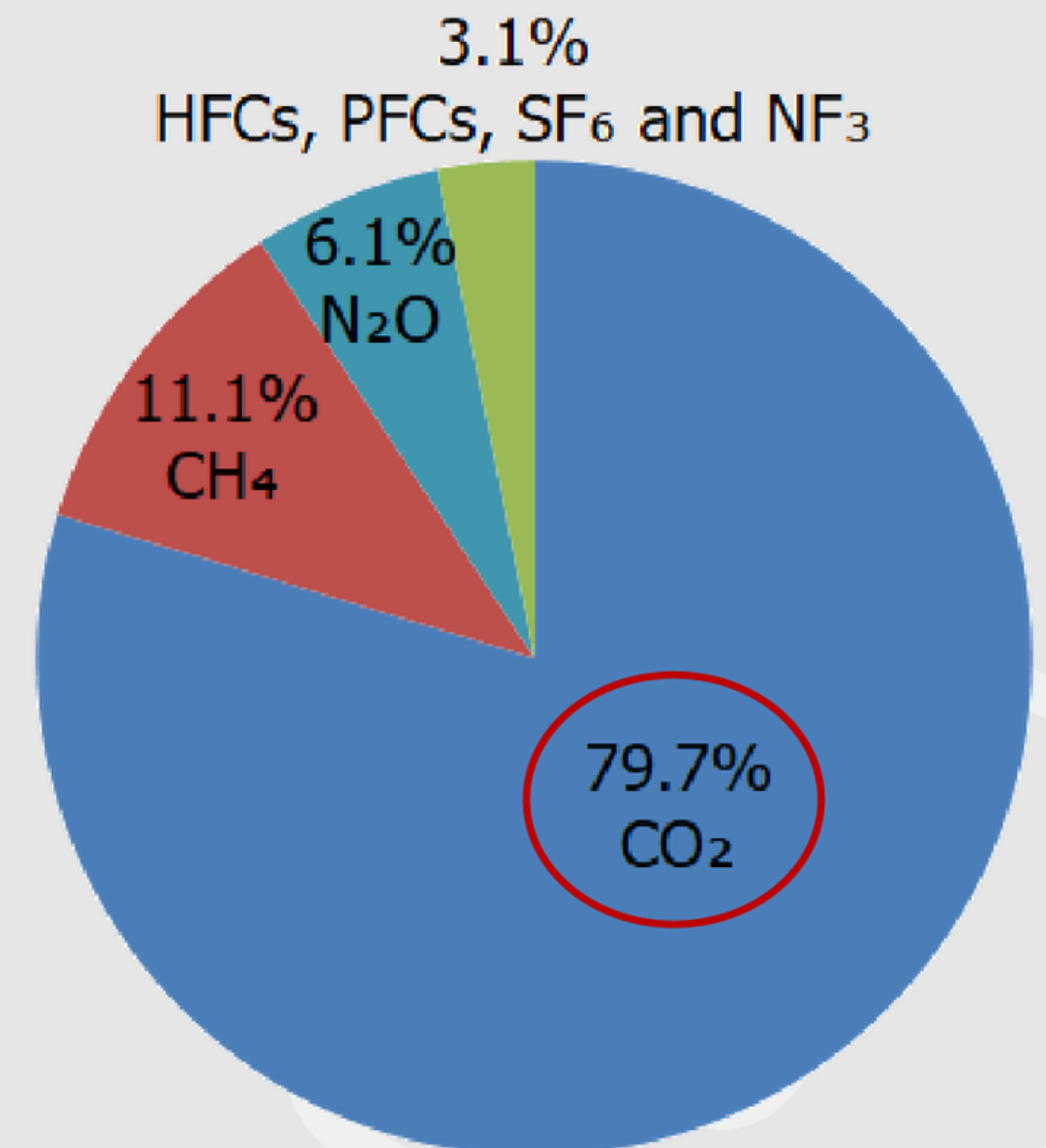
CO₂ remains in the atmosphere for 300 to 1,000 years and has a *cumulative* warming effect.

For every 5 years of delay, we will have to reduce 13X the emissions to prevent the same level of warming.



Reducing a ton of CO₂ today will provide a greater benefit to the planet and local communities than waiting for your fleet to transition or for new technologies to become available or affordable.

Greenhouse Gas Emissions Overview, by Type of Gas: 2022



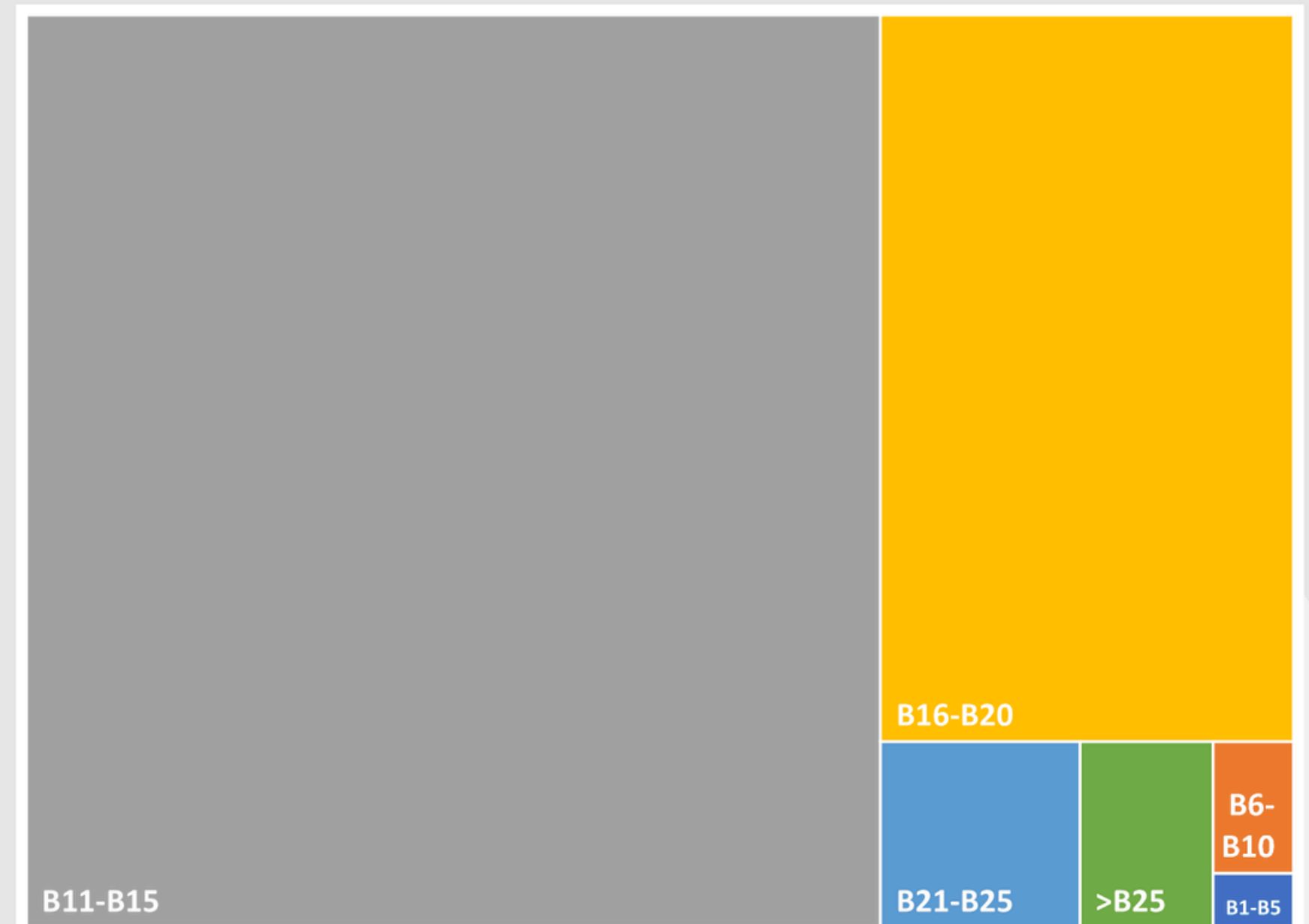
Real-World Carbon Reductions in Illinois

- In 2024, the CO₂ reduction provided by biodiesel was over 4.1 billion pounds.
- This is the equivalent of 433,792 cars removed from Illinois roadways or over 182 million fewer diesel gallons consumed.

Blend Rate	CO2 Reduction <i>Million Pounds</i>
B1-B5	15.7
B6-B10	38.0
B11-B15	2,803.6
B16-B20	1,079.1
B21-B25	133.7
>B25	89.1
Total	4,159.2



Illinois Biodiesel Carbon Emission Reduction by Blend Level (2024)



B20 Club Members By The #s Since 2014



3,786

vehicles & vessels
fueled with B20+



154.4

million gallons of
B20+ used since
founding



304,920

tons of CO2e
reduced since
founding



5,041,878

trees planted
equivalent to carbon
reductions since
founding



210,898

pounds of
particulate
reductions since
founding



\$42.3

million in estimated
health benefits
provided since
founding

Biodiesel Fuel Quality Improvements



Biodiesel Fuel Quality Has Significantly Improved



Assessment of BQ-9000 Biodiesel Properties for 2024

Robert L. McCormick

National Renewable Energy Laboratory

Produced under direction of Clean Fuels Alliance America by NREL under Cooperative Research and Development Agreement CRD-23-24281.



Comparing the quality of biodiesel today to the biodiesel from 30 years ago is like comparing a new iPhone to a rotary phone.

Fuel Quality & BQ-9000 Confidence

- The specification for biodiesel (D6751) is more stringent than most aspects of the diesel fuel specification (D975).
- Increasingly stringent ASTM specs and the BQ-9000 fuel quality program have led to extremely high-quality biodiesel and increased confidence amongst end-users and OEMs.
- Today's biodiesel has ultra-low metals, high oxidation reserve (stability), and very low minor components under the No.1-B low metals grade.
- BQ-9000 producers represent >90% of U.S. production.



- Originally published in 2002: ASTM D6751-02
- -03: **Added 15 ppm sulfur grade**
- -03a: Modified 'middle distillate' term, lubricity note
- -06: **Reduced AV from 0.8 to 0.5; added limit on Na+K.**
- -06a: **Added limit on Ca+Mg**
- -06b: **Addition of oxidation stability**
- -07: Modified language and added test methods
- -07a: Added alcohol control and modified flashpoint
- -07b: Added DCN and sulfur test methods
- -08: **Addition of cold soak filterability**
- **Introduction of B5 into D975 and publication of D7467 (B6 to B20 Standard)**
- -09a: Added cloud point test methods
- -10: Added EN15751 as referee method for stability
- -11: Added test methods and appendix on low temperature operability
- -11a: Replaced cold soak filterability annex with D7501
- -12: **Addition of 1B Grade, updated scope, new test methods**
- -20: Revised definition of biodiesel blends
- -23: Lowered minimum cetane number
- -23a: **Added low-metals grade (4 ppm total Na, K, Ca, Mg)**



OEM Confidence Is Growing

On-Road Market

OEM BRAND	BIODIESEL SUPPORT POSITION	RENEWABLE DIESEL SUPPORT POSITION
Audi	<u>B5 / B20*</u>	<u>R100*</u>
Blue Bird	<u>B20</u>	<u>TBA</u>
BMW	<u>B5 / B7*</u>	<u>R100*</u>
Cadillac	<u>B20</u>	<u>R99</u>
Chevrolet	<u>B20</u>	<u>R99</u>
Cummins	<u>B20</u>	<u>R100</u>
Daimler	<u>B5 / B20</u>	<u>R100</u>
Detroit Diesel	<u>B5 / B20</u>	<u>R100</u>
Ford	<u>B20</u>	<u>R100</u>
Freightliner	<u>B5 / B20</u>	<u>R100</u>
Freightliner Custom Chassis	<u>B5 / B20</u>	<u>R100</u>
GMC	<u>B20</u>	<u>R99</u>
Hino	<u>B20</u>	<u>R100</u>
International Motors	<u>B20</u>	<u>R100</u>
Isuzu	<u>B20</u>	<u>TBA</u>
Jaguar	<u>B20*</u>	<u>N/A</u>
Jeep	<u>B20*</u>	<u>N/A</u>
Kenworth	<u>B20</u>	<u>R100</u>
Land Rover	<u>B5 / B20*</u>	<u>TBA</u>
Mack	<u>B10 / B20</u>	<u>R100</u>
Mazda	<u>B20*</u>	<u>R100</u>
Mercedes	<u>B5</u>	<u>R100</u>
Mitsubishi Fuso	<u>B5*</u>	<u>N/A</u>
Nissan	<u>B20*</u>	<u>N/A</u>
PACCAR	<u>B20</u>	<u>R100</u>
Peterbilt	<u>B20</u>	<u>R100</u>
Porsche	<u>B5*</u>	<u>N/A</u>
Ram	<u>B20</u>	<u>R100</u>
Thomas Built	<u>B5 / B20</u>	<u>R100</u>
Volkswagen	<u>B5 / B20* / B100*</u>	<u>R100*</u>
Volvo	<u>B10 / B20</u>	<u>R100</u>
Western Star	<u>B5 / B20</u>	<u>R100</u>

Volvo expands its range of biodiesel-powered trucks

2024-05-16

A full range of new Volvo truck models can now be powered by 100% biodiesel, offering another renewable fuel choice for customers looking to reduce CO2 emissions from transport here and now.



Volvo approved B100 in FL, FE, FM, FMX, FH and FH16 models.

John Deere approved B30 in Tier 4 engines (including marine).

B100 approved in Tier 3 and older equipment (including marine).

NEWS RELEASE AUGUST 26, 2025

John Deere Announces B30 Biodiesel Compatibility Across Engine Portfolio

- B30 biodiesel now approved for use in all Tier 4 John Deere Power Systems engines
- Announcement supports John Deere's commitment to advancing renewable fuels

MOLINE, Illinois (August 26, 2025) — Today, John Deere (NYSE: DE) announced the approval of B30 biodiesel use across its entire portfolio of Tier 4 John Deere engines. This increases the previous approval of blends up to B20. The announcement will also be highlighted this week at the 2025 Farm Progress Show in Decatur, IL, where all John Deere equipment operated in the company's Ride and Drive area will run on B30 biodiesel.



Off-Road Market

OEM BRAND	BIODIESEL SUPPORT POSITION	RENEWABLE DIESEL SUPPORT POSITION
Agco	<u>B10</u>	<u>R100</u>
Arctic Cat	<u>B20*</u>	<u>N/A</u>
Buhler / Versatile	<u>B20</u>	<u>TBA</u>
CNH	<u>B20</u>	<u>R100</u>
Caterpillar	<u>B20 / B100</u>	<u>R100</u>
CLAAS	<u>B5</u>	<u>R100</u>
Cummins	<u>B20</u>	<u>R100</u>
Deutz AG	<u>B5/B20/B100</u>	<u>R100</u>
Ferris	<u>B20</u>	<u>R100</u>
FPT Industrial	<u>B20</u>	<u>R100</u>
Hustler Turf Equipment	<u>B5</u>	<u>TBA</u>
IVECO Group	<u>B20</u>	<u>R100</u>
JCB	<u>B20</u>	<u>R100</u>
John Deere	<u>B30 / B100</u>	<u>R100</u>
Kubota	<u>B20</u>	<u>R100</u>
Mahindra / Roxor	<u>B5 / B100</u>	<u>TBA</u>
McCormick	<u>B20</u>	<u>TBA</u>
New Holland	<u>B100</u>	<u>R100</u>
Perkins	<u>B20</u>	<u>R100</u>
Tomcar	<u>B20</u>	<u>TBA</u>
Toro	<u>B20</u>	<u>TBA</u>
Volvo Penta	<u>B10 / B30</u>	<u>R100</u>
Wartsila	<u>B10 / B20 / B30</u>	<u>R100</u>
Yanmar	<u>B20</u>	<u>TBA</u>

OEM Confidence Is Growing

On-Road Market

RAILROAD MARKET		
OEM BRAND	BIODIESEL SUPPORT POSITION	RENEWABLE DIESEL SUPPORT POSITION
Alstom (CAT)	<u>B20</u>	<u>R100</u>
Brookville Equipment Corp.	<u>B20</u>	<u>R100</u>
Caterpillar	<u>B20 / B100</u>	<u>R100</u>
Colmar Rail / SRT Rail	<u>TBA</u>	<u>TBA</u>
Cummins	<u>B20</u>	<u>R100</u>
Electro-Motive Diesel	<u>B20</u>	<u>R100</u>
MTU / Rolls Royce	<u>B5 / B20 / B100</u>	<u>R100</u>
Progress Rail (CAT)	<u>B20</u>	<u>R100</u>
Siemens Mobility	<u>B20</u>	<u>R100</u>
Wabtec / GE Rail	<u>B20</u>	<u>R100</u>

Progress Rail Approves B20 Biodiesel Fuel for Use in EMD® Engines

August 26, 2021

ALBERTVILLE, Ala. – Progress Rail, A Caterpillar Company, is committed to offering sustainable solutions by providing products that facilitate fuel transition, increase operational efficiency, and reduce emissions.

To help customers achieve their climate-related goals, Progress Rail has approved the use of up to 20% biodiesel blend (B20) across its range of 645 and 710 series engines.

"Progress Rail is leading the rail industry in providing the greatest range of fuel flexibility, making a meaningful, positive impact on the environment and supporting our customers' energy savings goals," said Marty Haycraft, President & CEO of Progress Rail.

Wabtec and Union Pacific Railroad Partner to Reduce Emissions with Higher Biodiesel Blends



Magnuson-Moss Warranty Act

- **While OEM support positions remain an important point of reference, for a warranty claim to be denied, the manufacturer must definitively demonstrate that a non-approved fuel or product directly caused the failure.**
- **Warranties are evaluated on a case-by-case basis—not automatically voided—placing the burden of proof on the OEM.**
- **The same rules surrounding upfits for propane, CNG, and other alternatives also apply for biodiesel.**

HELLO I HAVE BEEN TRYING TO
REACH YOU ABOUT YOUR CARS
EXTENDED WARRANTY



Biodiesel Operational Benefits



Biodiesel Can Provide Maintenance Benefits

Higher Lubricity: Biodiesel can restore lubricity to low-sulfur diesel fuels at blend levels of 1-2% biodiesel in ultra-low sulfur diesel (“ULSD”) fuel.

Higher Cetane: The minimum cetane for biodiesel is 45 while the minimum for ULSD is 40. Soybean oil-derived biodiesel cetane ranges from 45 to as high as 67.

Burns Cleaner: Biodiesel reduces particulates which can lead to improvements in DPF regeneration intervals and operations.

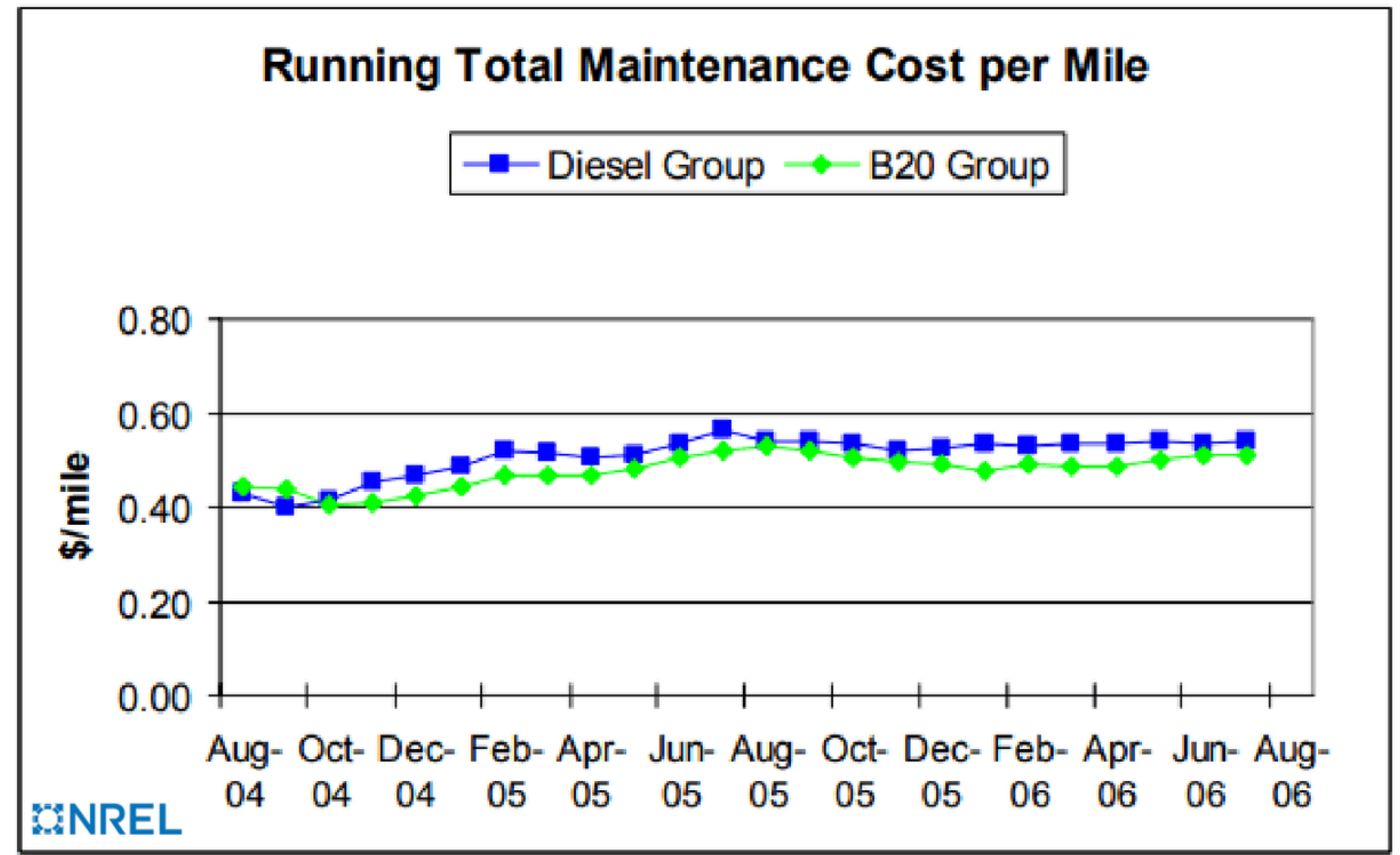
Extended Oil Life: Biodiesel has also been shown to extend oil change intervals in some equipment.



Biodiesel Can Provide Maintenance Benefits

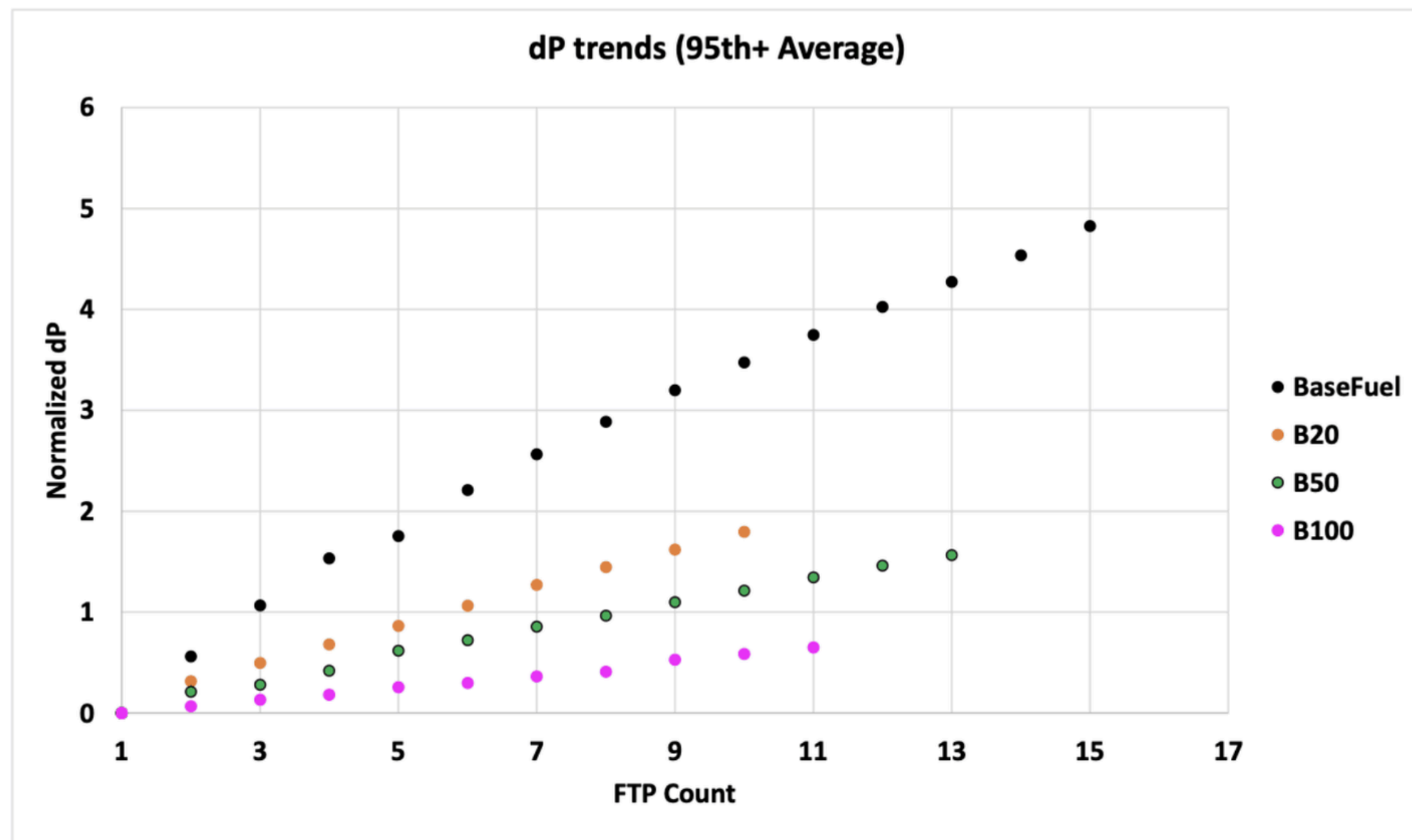
A National Renewable Energy Laboratory (NREL) – now National Lab of the Rockies – transit study found that:

- Maintenance cost per mile was lower with B20 vs ULSD.
- Oil analysis showed significantly less soot in the B20 samples.
- Laboratory emissions testing showed reductions in all measured pollutants, including NOx.



Source: Field Evaluation of Biodiesel (B20) Use by Transit Buses

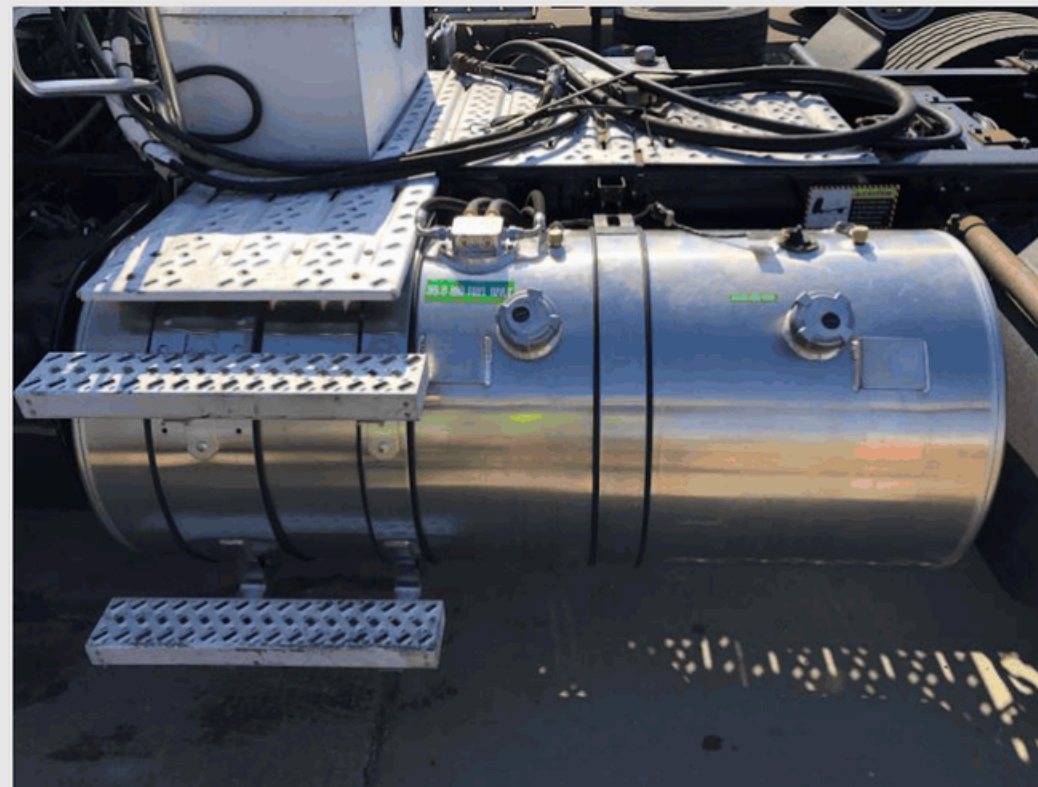
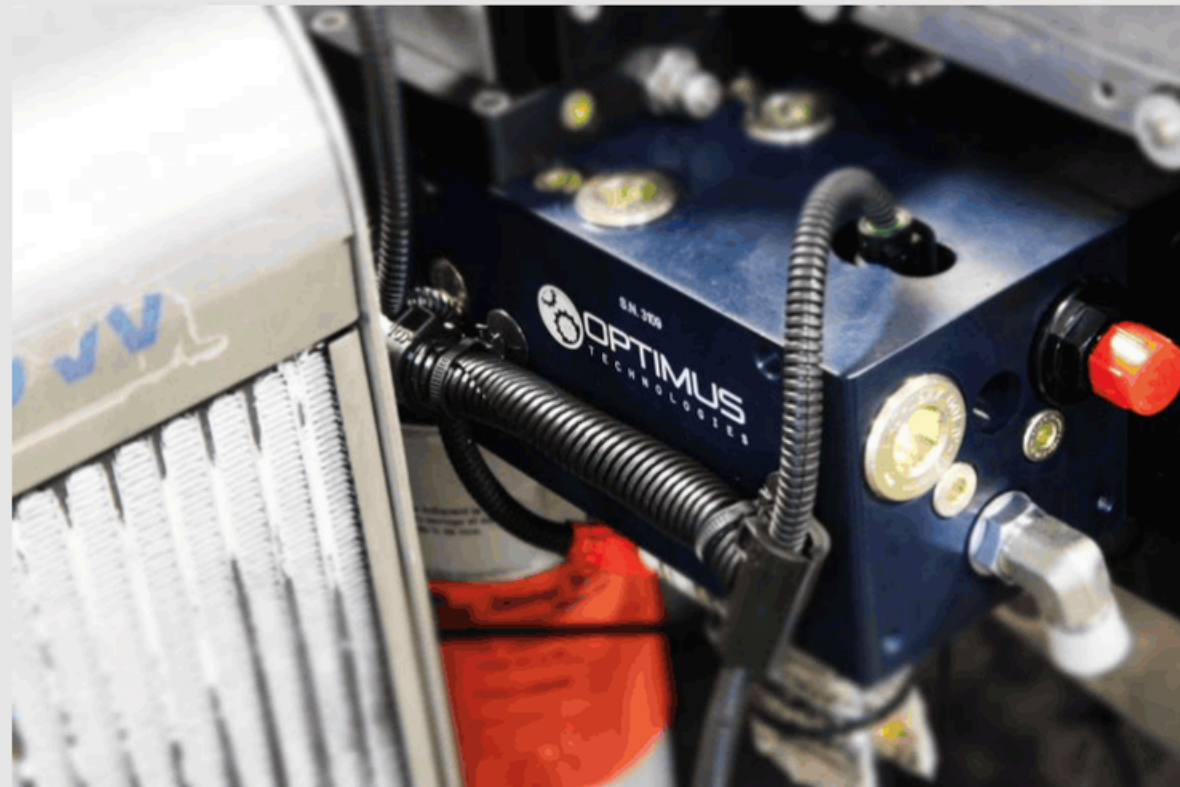
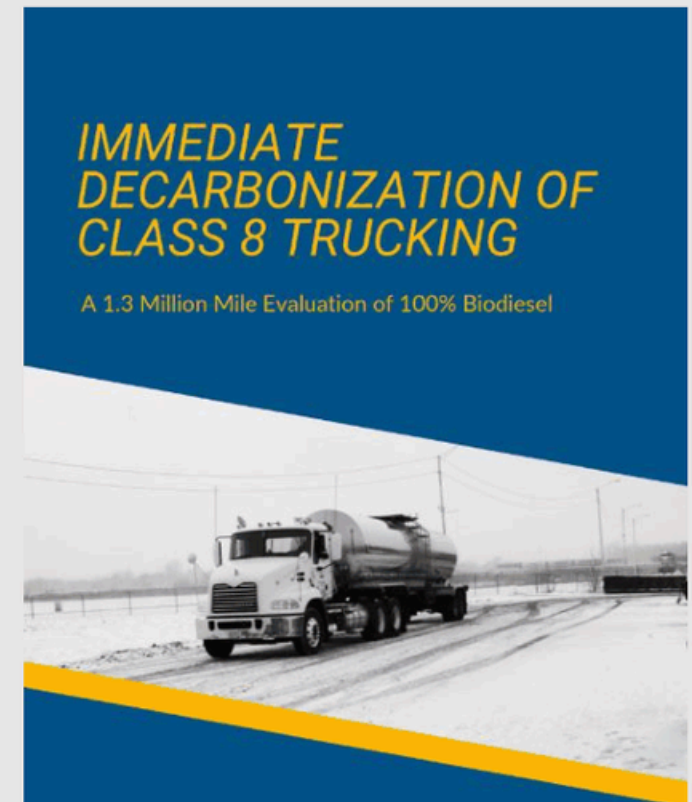
DPF dP / Soot Loading Comparison (combined CRC/CFAA data set)



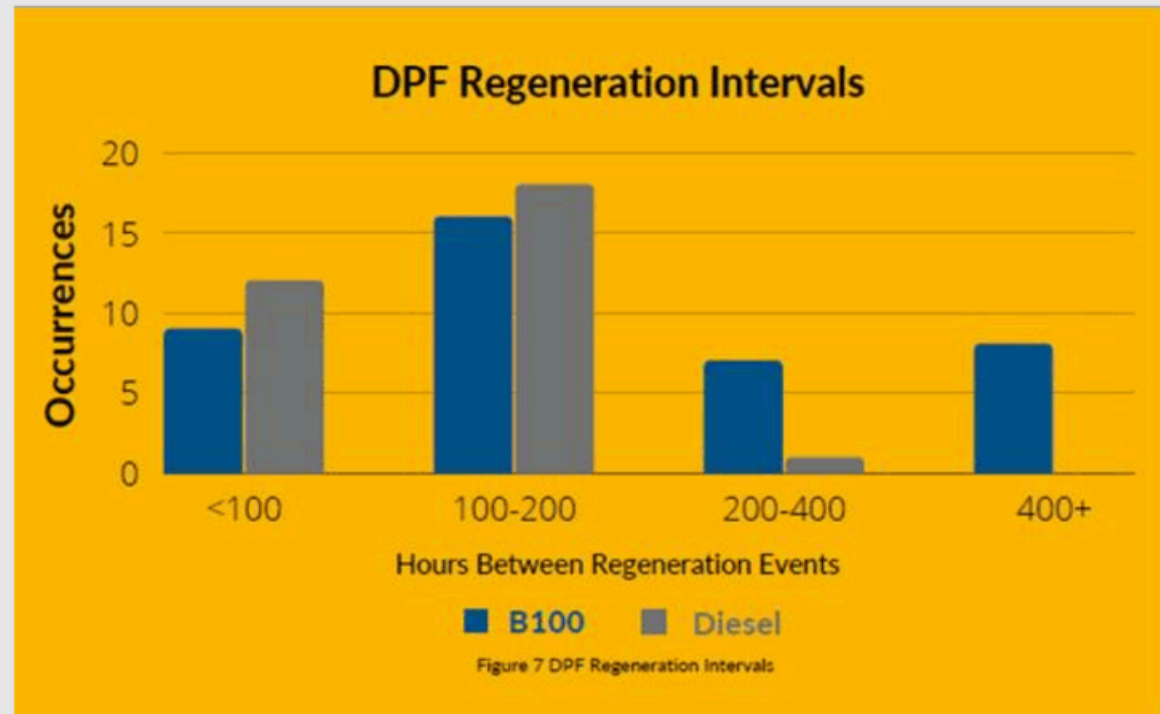
DPF Clean-out before start of each sequence
Data are zeroed to initial DPF dP from first FTP in sequence
(4.5 to 5 kPa)

- 2027 Engine Emissions Set Up
- **B20 shows large improvement compared to Base Diesel Fuel**
 - Significant reduction in DPF regeneration frequency
- **Further improvement with B50 and B100 respectively**
- **B100 loading rate is 7-8X lower than base fuel**
 - This will have an impact on regeneration frequency and possibly downstream system durability
- B50 is between B20 and B100
 - Still 3-4X improvement over baseline

Biodiesel Can Provide Maintenance Benefits

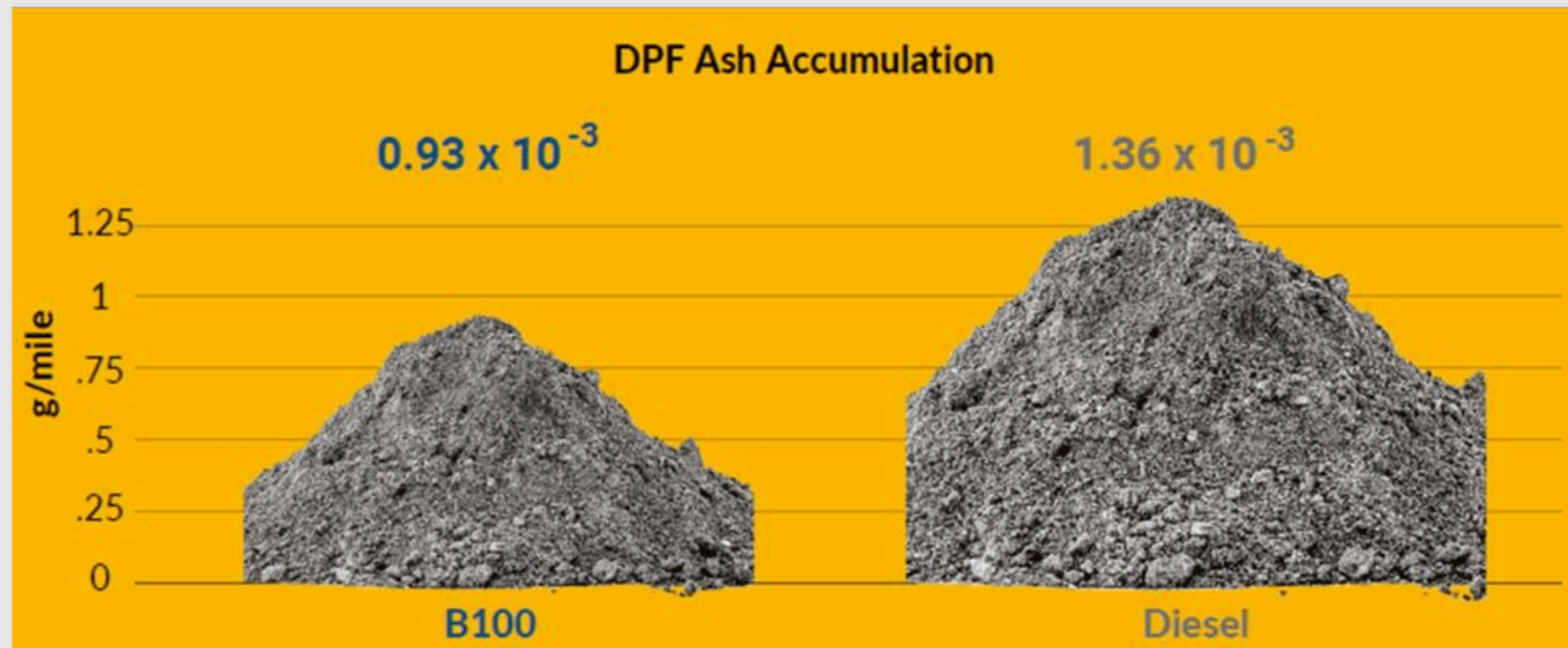


Biodiesel Can Provide Maintenance Benefits



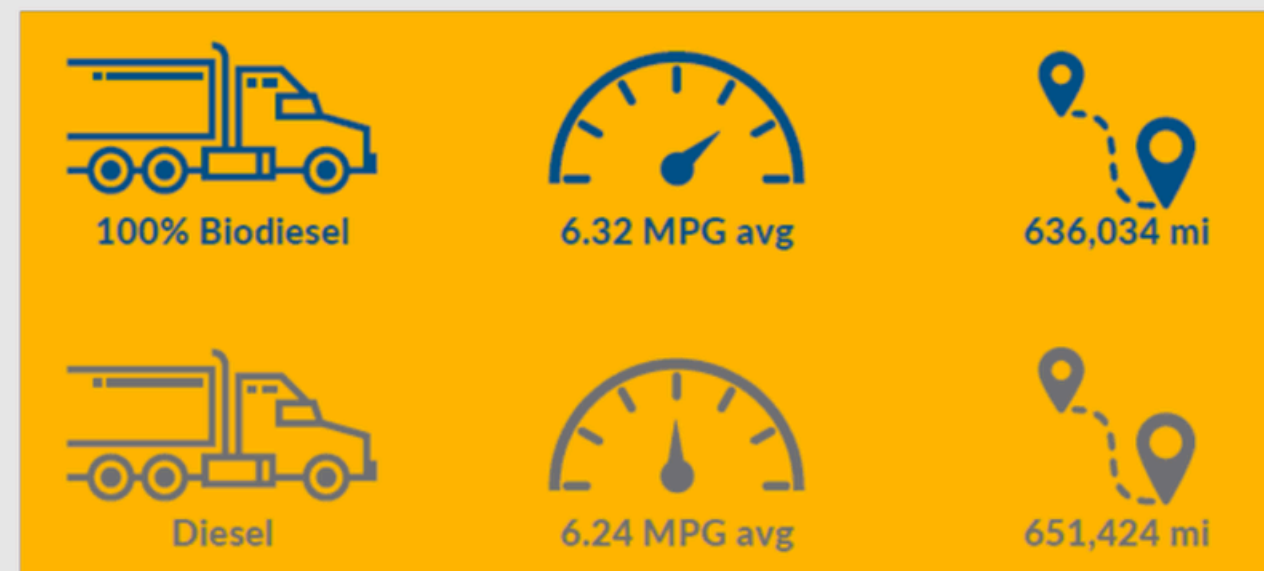
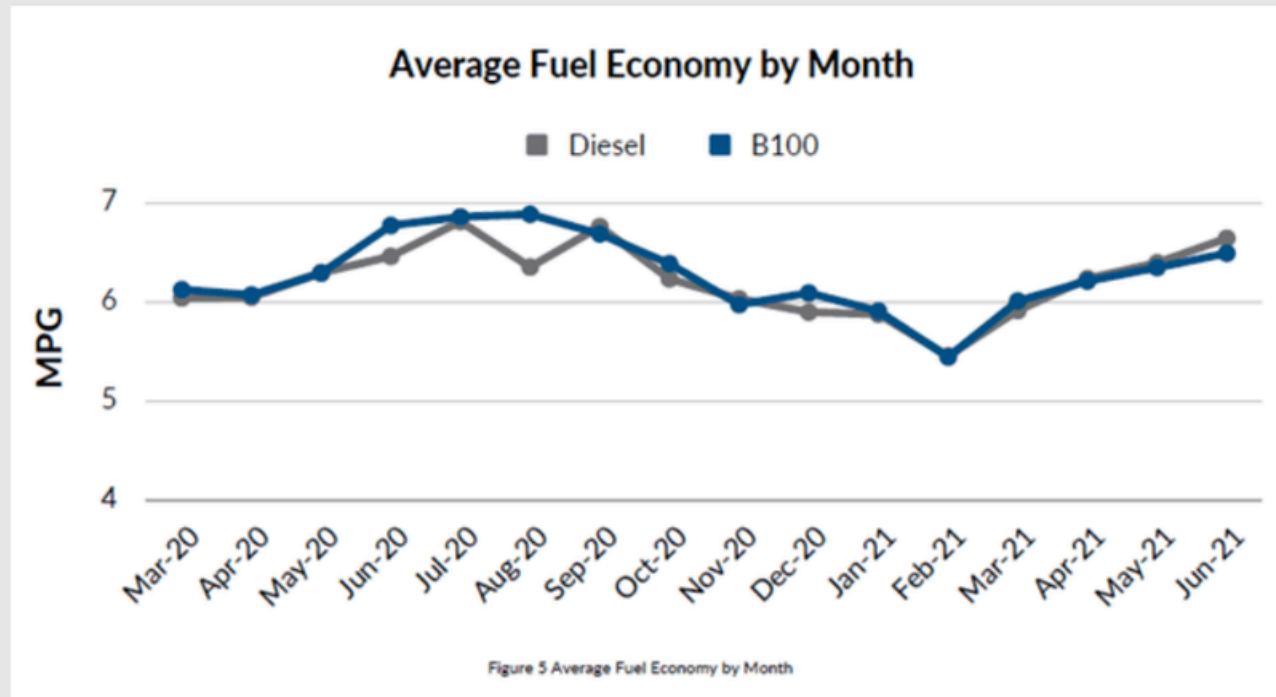
A statistically significant increase in regeneration interval of 121.3 hours was found on the Vector System trucks when compared to the diesel trucks (see Table A.6).

102% improvement in regen intervals



DPF units from the Vector System trucks averaged a 13% improvement in ash clean out (55% vs. 42%) when compared to the diesel control group.

Biodiesel Can Provide Maintenance Benefits



The results of this field trial conclude, with statistical significance, that **the oxidation levels of the oil from the engines upgraded with the Vector Systems improved by 5%** compared to the diesel engine oil samples.

Oxidation Levels

Higher oxidation levels of the lubricating oils can have a negative impact on the wear and tear of the engine and can increase the chances of catastrophic failure. The oxidation values of the oil are presented as a percentage of oxidation, with 100% indicating a completely oxidized oil sample. The oxidation values for the Vector System engine oil samples averaged 43% compared to the baseline B11 engine oil samples which averaged 48% (see Table A.9).

B100 Biodiesel Growing In On-Road



ADM Trucking has 50 units on B99/B100 operating on the road today.

Fuel with Pilot and utilize a fuel system upfit from Optimus Technologies.

Growing Biodiesel Adoption In Locomotives



Union Pacific, CN, and other Class 1 railroads are already using biodiesel blends up to B20 to help meet their decarbonization goals. Several are looking to increase biodiesel blends and use of renewable diesel to further lower emissions.

Growing Biodiesel Adoption In Marine



American River Transportation Company (ARTCo) consumes B20-B30 biodiesel blends on the Mississippi and Illinois River systems every year.



B20 Club Fleets Are Going Strong



- 3,700+ unique pieces of equipment running on biodiesel blends of B20 and higher blends.



B20Club.org



Questions?

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