

Clean Fuels
ALLIANCE AMERICA



NC CLEAN ENERGY
TECHNOLOGY CENTER

**Product Feature: Cutting Carbon with Clean Fuels:
Accelerating Fleets' Transition to Clean Energy Today**

September 27, 2021



Upcoming Webinar Sessions

- **09/29 SFT Webinar: Avoiding the Potholes in the Road Fleet Electrification**
- **10/11 Product Feature Webinar: Cenntro Low Speed Electric Vehicle Small Utility Through Class 4 Features and Applications**
- **10/13 SFT Webinar: Funding Opportunities to Support Your Sustainable Fleet Efforts**
- **10/18 Product Feature Webinar: 5 Reasons Why Your Organization Can Benefit from Electric Tractors with Solectrac**
- **10/27 SFT Webinar: Maintaining Your Level of Service and Balancing Sustainability Goals with a Broken Supply Chain**





 **SUSTAINABLE
FLEET
TECHNOLOGY**
WEBINAR SERIES 2022

Sessions through December 06, 2022

<https://www.sustainablefleetexpo.com/>



Format

- Q&A at the end
- Submit questions and comments to “Panelists”
- Scheduled for 2:00p-3:00p
- Handout
- Recording





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Clean Transportation Program

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CUTTING CARBON WITH CLEAN FUELS: ACCELERATING FLEETS' TRANSITION TO CLEAN ENERGY TODAY

Product Feature Webinar – September 27, 2022 – 2:00 – 3:00 PM ET

Clean Fuels Alliance America, Chevron REG, Optimus Technologies



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INTRODUCING OUR SPEAKERS:



Jennifer Weaver
OEM Market
Development Manager



Jon Scharingson
Executive Director,
Strategic Initiatives



Colin Huwyler
Chief Executive Officer





ROADMAP FOR THIS PRESENTATION:

- The Time Value of Carbon
- Clean Fuels Industry Overview
- Policies Driving Industry Growth
- OEM & Fleet Support
- Properties and Benefits of Biodiesel & Renewable Diesel
- Overview of Optimus Technologies
- Fleet Success Stories
- Information Resources
- Q&A





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THE TIME VALUE OF CARBON: WHY DO WE NEED CLEANER, BETTER FUELS NOW?



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CLIMATE CHANGE IS TIME CRITICAL

“If we continue with business as usual, global temperatures are predicted to rise another 2°C above preindustrial times by 2030; this temperature change is widely accepted by the world scientific community as the point at which climate change becomes catastrophic, often referred to as the global tipping point.” - SOURCE: “Time Value of Carbon” by Larry Strain, FAIA

The potential future effects of global climate change include more frequent wildfires, extreme heat and longer periods of drought in some regions, and an increase in the number, duration and intensity of tropical storms among other impacts.



CUTTING CARBON: THE TIME IS NOW

When evaluating emission reduction strategies, there are two essential elements to consider: the **amount** of the reduction, and **when** it happens.

- Carbon emissions are persistent and accumulate
- Increased levels of carbon dioxide (CO₂) in the atmosphere contribute to global warming now and for decades to come
- A reduction in CO₂ emissions now can avoid decades of associated warming, having significantly more value than a similar or greater reduction made in the future

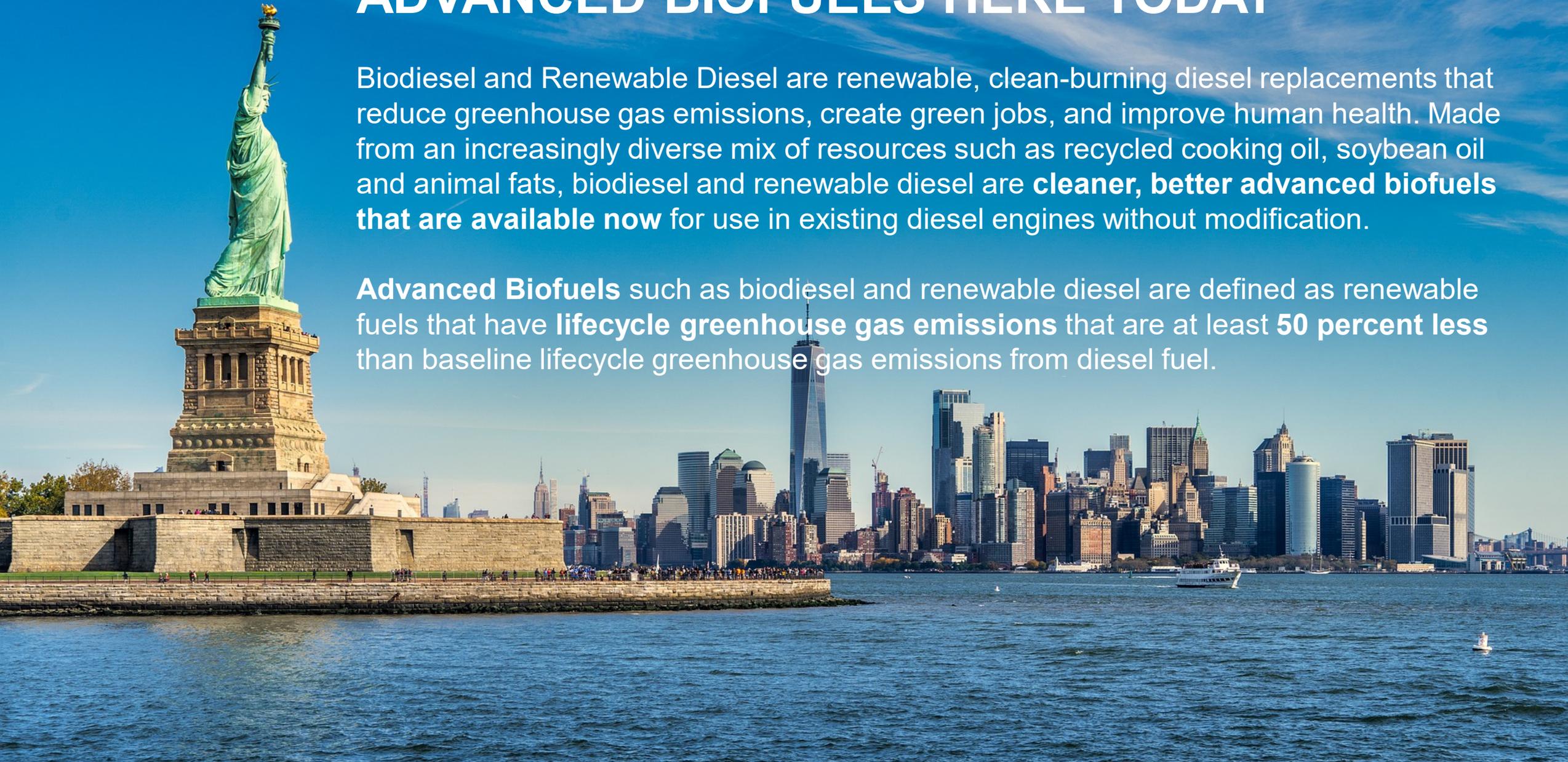
**The Time Value of Carbon is key,
and the next decade is critical.**



BIODIESEL & RENEWABLE DIESEL – ADVANCED BIOFUELS HERE TODAY

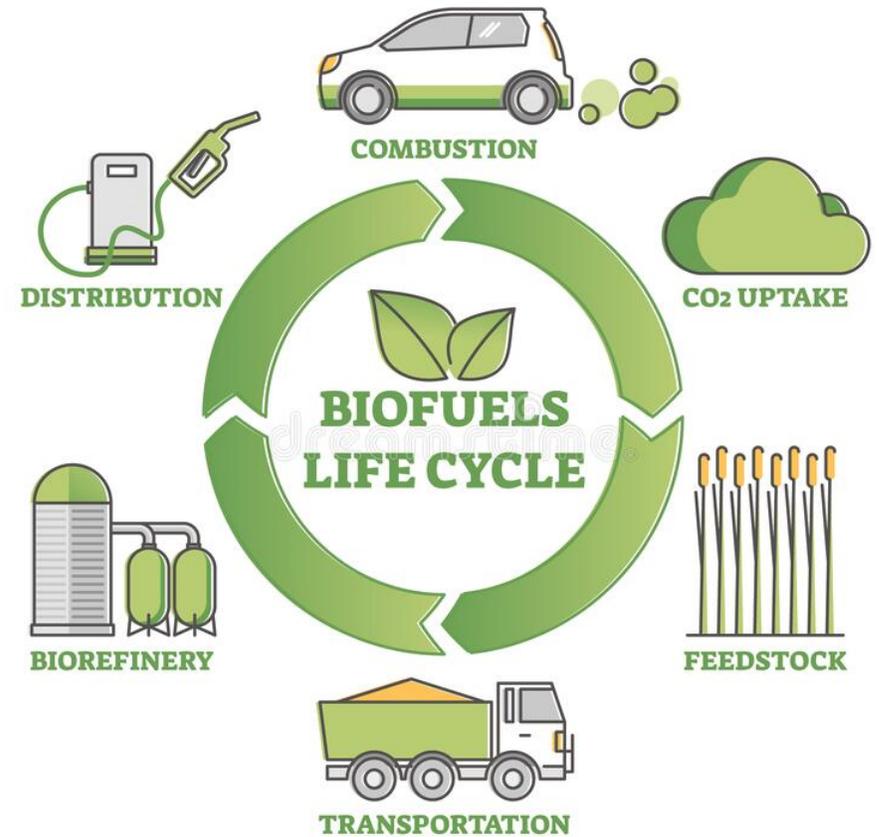
Biodiesel and Renewable Diesel are renewable, clean-burning diesel replacements that reduce greenhouse gas emissions, create green jobs, and improve human health. Made from an increasingly diverse mix of resources such as recycled cooking oil, soybean oil and animal fats, biodiesel and renewable diesel are **cleaner, better advanced biofuels that are available now** for use in existing diesel engines without modification.

Advanced Biofuels such as biodiesel and renewable diesel are defined as renewable fuels that have **lifecycle greenhouse gas emissions** that are at least **50 percent less** than baseline lifecycle greenhouse gas emissions from diesel fuel.



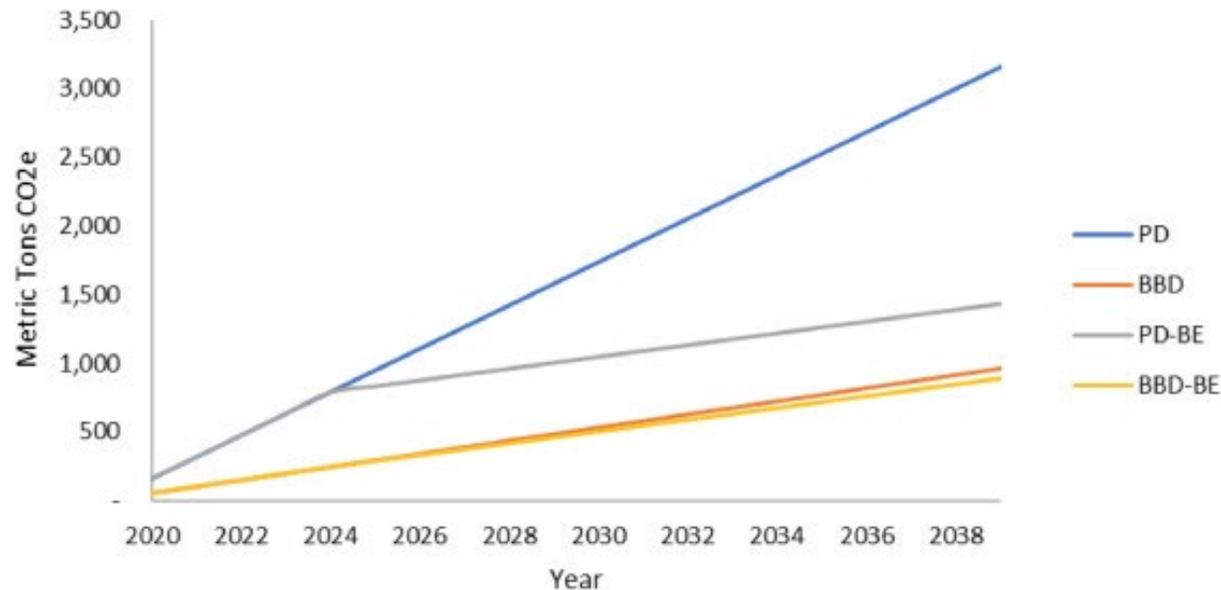
BIODIESEL LIFE CYCLE EMISSIONS

- Per Argonne National Lab, average life cycle GHG emissions with biodiesel are 74% below petroleum
- California Air Resources Board shows similar results:
 - The most efficient biodiesel producers are currently 90% lower



COMPARATIVE CARBON REDUCTION BENEFITS

Cumulative GHG Emissions by Fuel System



Source: Jenny Frank, Tristan Brown, Martin Haverly, Dave Slade, Robert Malmshemer. [Quantifying the comparative value of carbon abatement scenarios over different investment timing scenarios](#). Fuel Communications; Volume 8, 2021, 100017.

Research Study - State University of New York College of Environmental Science and Forestry:

Immediate investment in a mature, currently commercialized Biomass-Based Diesel (BBD) scenario using blends of Biodiesel and Renewable Diesel accounts for the second-lowest total quantity of greenhouse gas (GHG) emissions among the four scenarios analyzed.

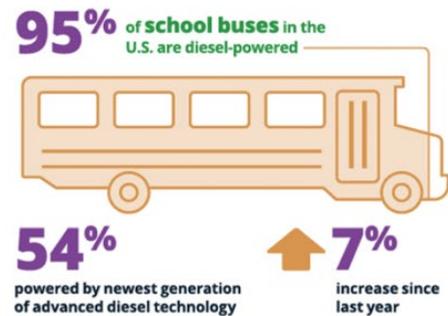
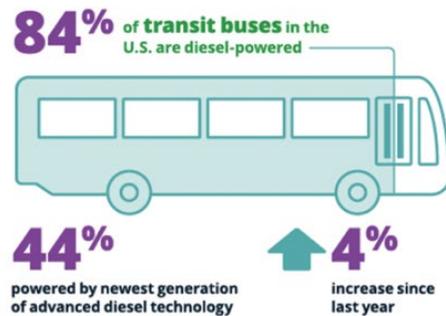
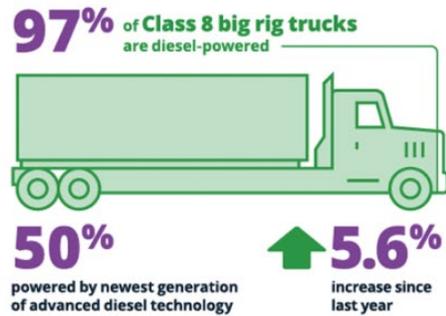
Additionally, investing immediately in BBD and then transitioning to Battery Electric (BE) technologies over time accounts for the lowest total GHG emissions.

Both of these options involving Biomass-Based Diesel significantly outweigh the carbon reduction benefits of using Petroleum Diesel (PD) exclusively or transitioning from PD to BE after several years.

BIODIESEL & RENEWABLE DIESEL OFFER BETTER SOLUTIONS NOW

	Biodiesel & Renewable Diesel	Electrification
VEHICLE COST	<ul style="list-style-type: none"> • Can be used in any diesel vehicle with no modifications required • Fleets can immediately lower their carbon footprint with existing fleet of vehicles • Majority of OEMs support use of up to 20% Biodiesel or up to 100% Renewable Diesel 	<ul style="list-style-type: none"> • Requires purchase of costly new electric vehicles, hundreds of thousands of \$\$\$ more than their diesel counterparts: EV bus ~ \$120K more • Additionally, charging infrastructure costs can range from \$100,000 (depot) - \$400,000 (on-demand) for each new BEV charging port
RANGE	<ul style="list-style-type: none"> • Provides similar power, performance, hauling capability and fuel economy as diesel fuel • No range anxiety on long-haul routes • Operate seamlessly with fleets' existing duty cycles 	<ul style="list-style-type: none"> • Payloads and road access can be limited by EV battery weight in certain applications • Range varies widely and is currently limited to only around 130-300 KM (80 – 186 miles) per charge, depending on batteries, route, HVAC use
REFUELING	<ul style="list-style-type: none"> • Biodiesel blends are readily available from over 2,400 major truck stops & distributors nationwide, pumped from existing infrastructure • Renewable Diesel available on West Coast and production is expanding rapidly • Biodiesel and Renewable Diesel can be used in blends with, or interchangeably with ULSD, allowing maximum flexibility for refueling 	<ul style="list-style-type: none"> • Current electric vehicle charging infrastructure for commercial vehicles is limited and unstandardized, especially in public locations • Charging time for electric vehicles varies widely by battery size & method. Fastest possible charge for a Class 8 tractor is ~ 70 minutes to 4 hours on DC fast charge, or 8-16 hours on Level 2 system; impractical for time-sensitive or long-haul operations

DIESEL VEHICLES HAVE A LONG TRAJECTORY IN FLEETS



- Fleet vehicle replacement cycle averages between 5-15 years for majority of fleets
- Average age of commercial vehicles in operation in 13.8 years
- Biodiesel and Renewable Diesel work well in both legacy and new diesel engines, offering immediate carbon reductions in existing fleet of vehicles

Sources - December 2020 U.S. Vehicles in Operation Data (Class 3-8 vehicles, Model Year 2010 and newer) provided by IHS Markit / December 2020 U.S. Vehicles in Operation Data (Transit buses, Model Year 2010 and newer) provided by IHS Markit / December 2020 U.S. Vehicles in Operation Data (School buses, Model Year 2010 and newer) provided by IHS Markit / AutoForecastSolutions, 2021



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INDUSTRY VISION & OVERVIEW





BIODIESEL & RENEWABLE DIESEL TODAY



Production

Today's market has reached over 3.2 billion gallons with more than 3.5 billion gallons of domestic production capacity online today.

Capacity of planned US expansions will grow to over 5 billion gallons by 2023.



Feedstocks



Soybean oil makes up the largest supply of biodiesel/renewable diesel today at 49%. The rest make up the balance almost equally.



Markets

Today's markets are made of fleets, on-road and off-road diesel, as well as the expanding heating oil market.

Renewable jet fuel, marine fuel and railroad applications are also emerging markets.



Policy

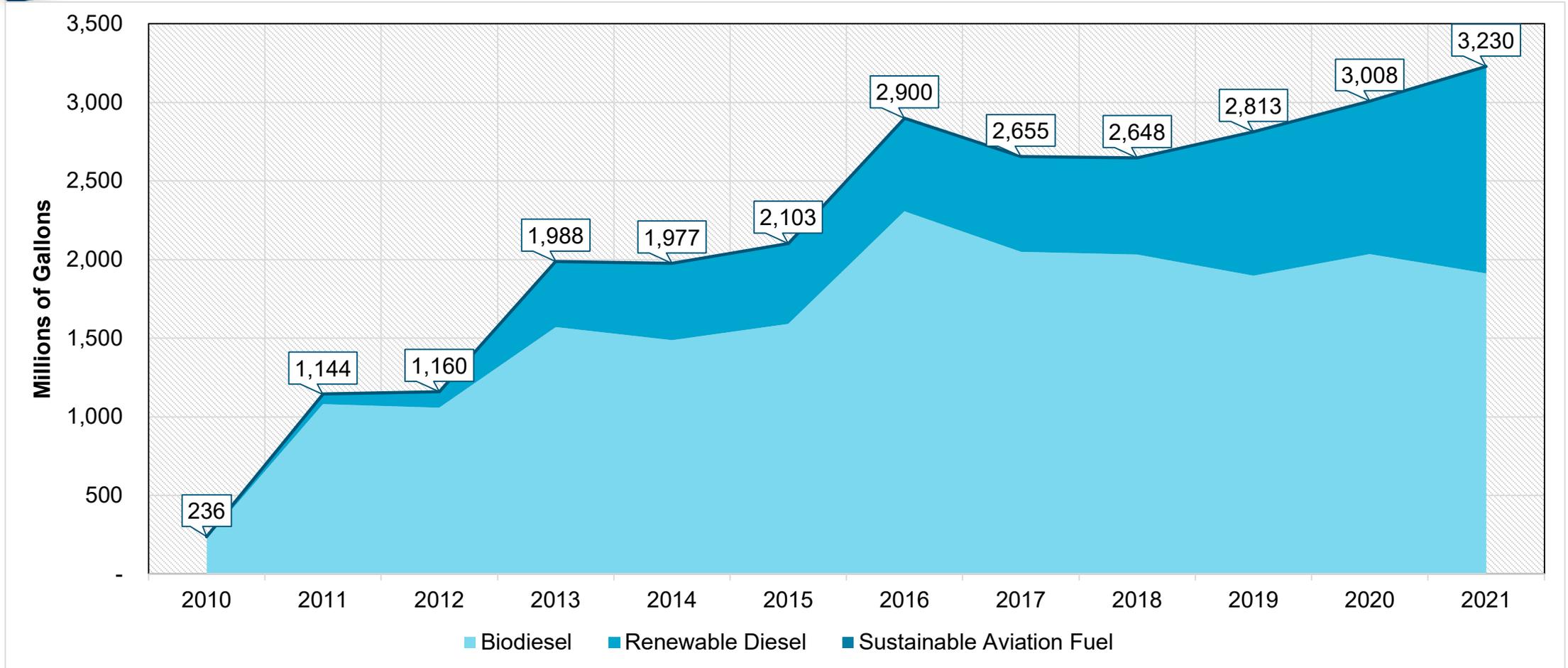
Combination of legislation that drives biodiesel success:

- **Renewable Fuel Standard**
- **Federal Tax Incentive**
- **Carbon Policies**
- **State Mandates and Incentives**
- **USDA Higher Blend Infrastructure Incentive Program**





U.S. BIOMASS-BASED DIESEL CONSUMPTION

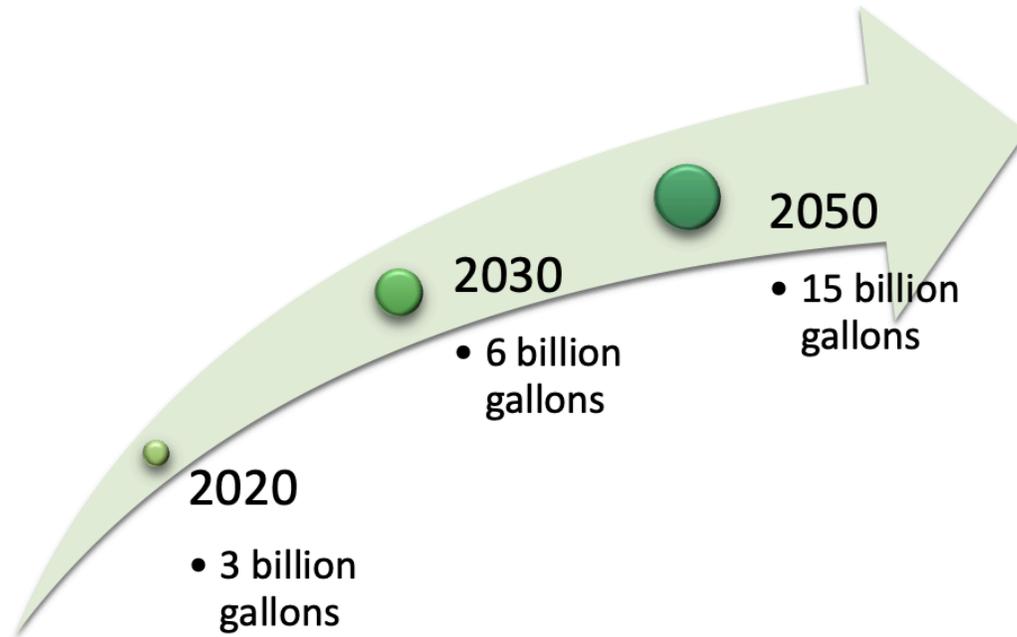




CLEAN FUELS ALLIANCE AMERICA VISION

Biodiesel, renewable diesel, and renewable jet fuel will be recognized as mainstream low-carbon fuel options with superior performance and emission characteristics.

In on-road, off-road, air transportation, electricity generation, and home heating applications, use *will exceed six billion gallons by 2030*, eliminating over 35 million metric tons of CO₂ equivalent greenhouse gas emissions annually. With advancements in feedstock, use will reach *15 billion gallons by 2050*.



FEEDSTOCK OPTIONS FOR BIOMASS-BASED DIESEL

(JAN TO MAY 2022)

EPA APPROVED PATHWAYS



Distillers Corn Oil



Animal Fats



Soybean Oil



Camelina



Canola Oil (biodiesel only)



Used Cooking Oil/Yellow Grease



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BIODIESEL INFRASTRUCTURE

- Biodiesel and biodiesel blends available nationwide at more than 2,400 public locations, including major truck stop operators
- Existing trucks, tanks, dispenser pumps and blending facilities can be used for B20 and lower
- Find a biodiesel producer, distributor or retailer near you at <https://www.biodiesel.org/using-biodiesel/finding-biodiesel> and at <https://afdc.energy.gov/stations#/find/nearest?fuel=BD>



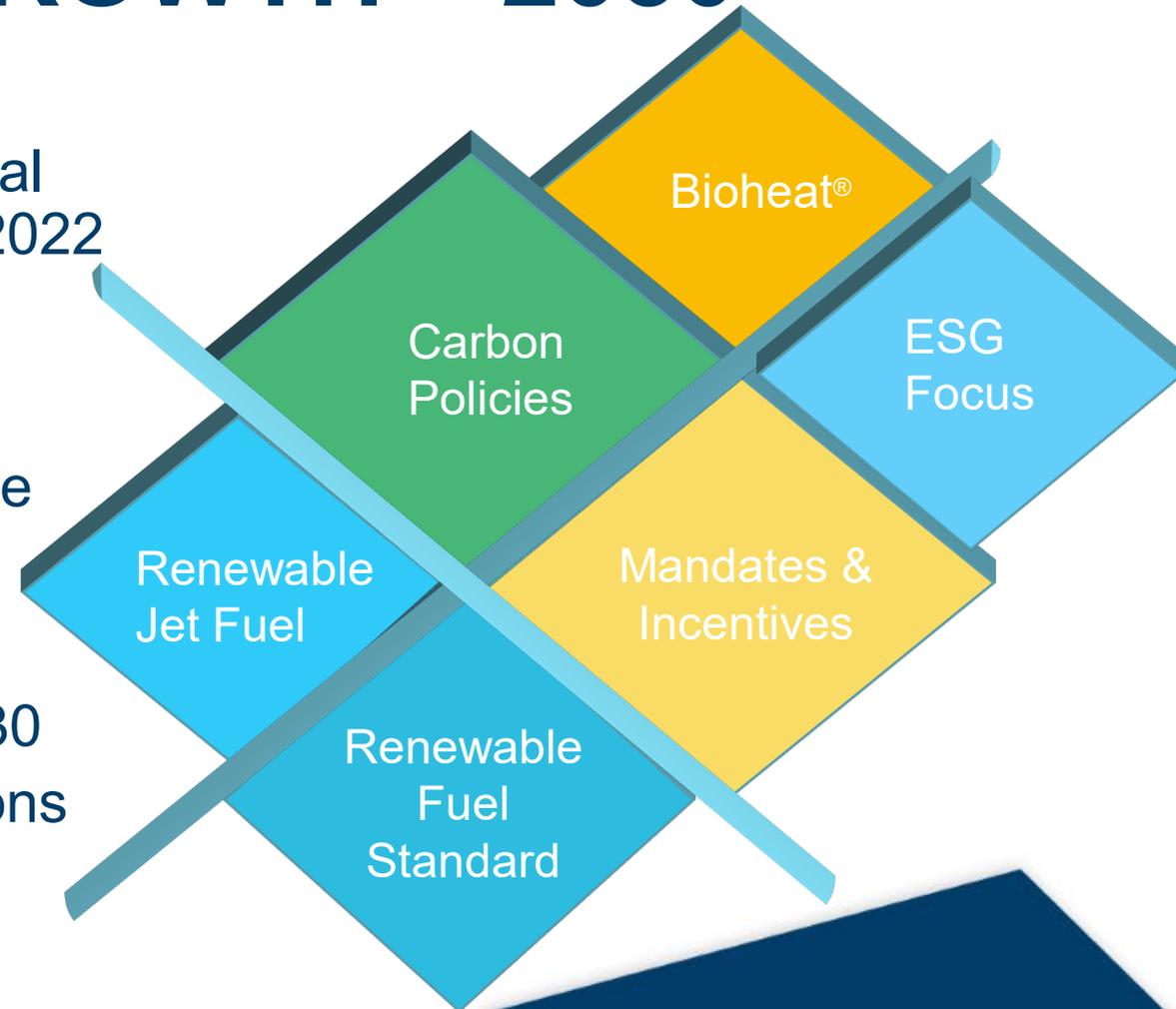


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POLICIES DRIVING INDUSTRY GROWTH

TRENDS BEHIND THE GROWTH – 2030

- Renewable Fuel Standard
 - Federal policy that supports all state/regional markets; RVO Proposal expected by Nov. 2022
- Current State and Regional Policies
 - More than 3 billion gallons by 2030
 - Come in many forms: Carbon Policies, State Programs, and Incentives
- Bioheat Markets
 - “Providence Resolution” is near B50 by 2030
 - B50 in current market approx. 3 billion gallons
- Corporate ESG Programs & Fleet Sustainability Goals



TAX CREDIT UPDATE

2023 - 24 Blenders Tax Credit and SAF Tax Credit

	BD/RD	SAF
Base value	\$1.00	\$1.25
Top Value	\$1.00	\$1.75
Carbon Scoring	NA	ICAO or similar methodology
Years	2023-24	2023-24
Methodology	NA	50% GHG reduction threshold + \$0.01 for each percentage point above 50%
Petroleum Jet Baseline	NA	93.9 kgCO ₂ e/MMBTU
Allow co-processing	x	x

Clean Fuel Production Credit

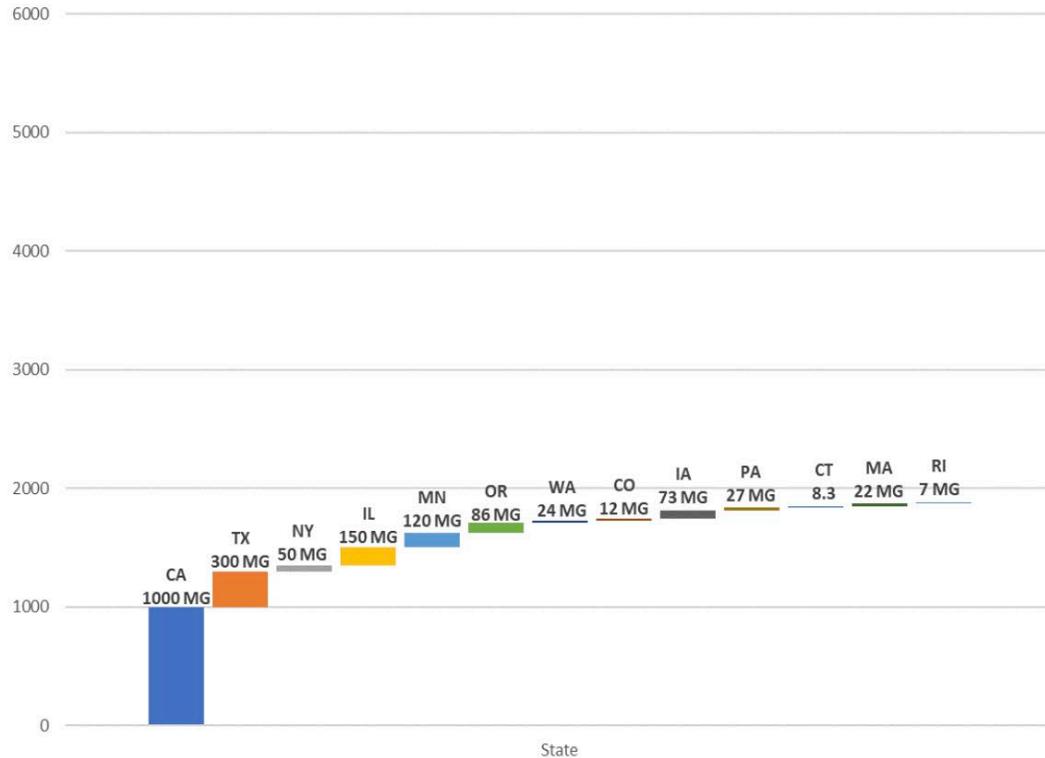
	BD/RD	SAF
Base value	\$0.20	\$0.35
Top Value	\$1.00	\$1.75
Carbon Scoring	GREET	ICAO or similar methodology
Years	2025-27	2025-27
Carbon Scoring denominator (credit value calculated as a proportion)	50kg	50kg
Domestic production	✓	✓
Allow co-processing	x	x



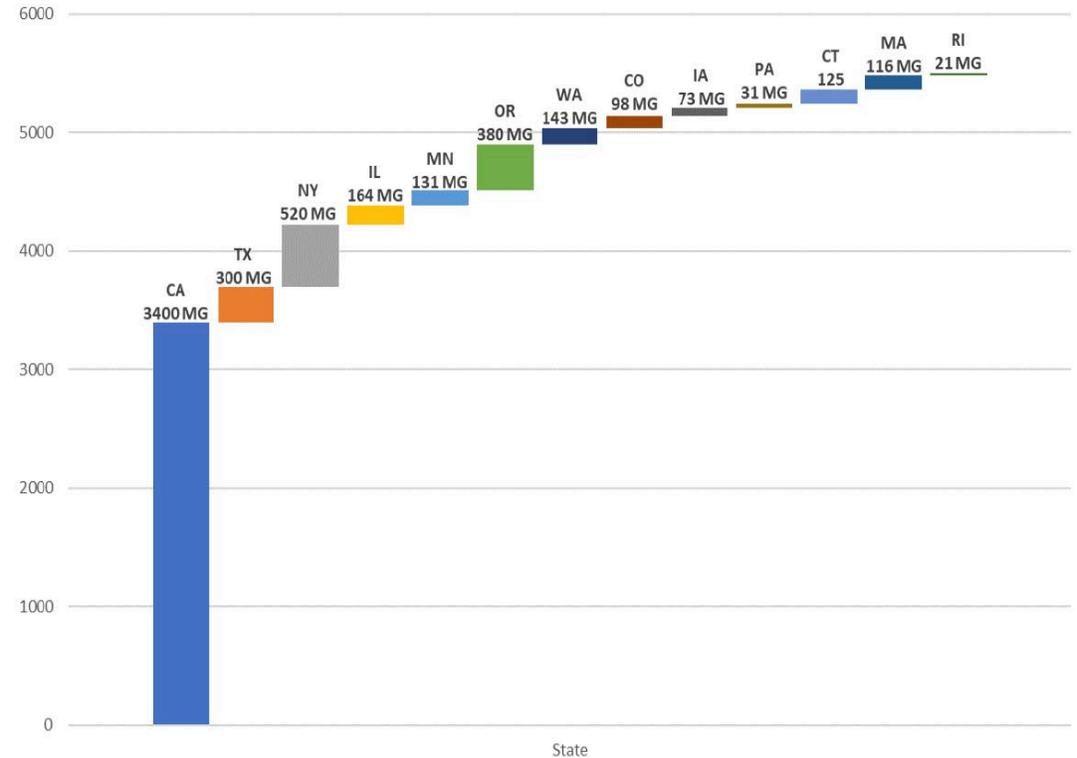
STATES DRIVING BIODIESEL VOLUMES

*Potential growth based on established or proposed requirements

2020 1.9 Billion Gallon State Market



2030* 5.3 Billion Gallon State Market



INFRASTRUCTURE GRANTS

- USDA Higher Blend Infrastructure Incentive Program (HBIIP)
 - \$100 million additional funds in 2022.
 - Application opened Aug. 23 – closes Nov. 21.
- Biofuel Infrastructure and Agricultural Product Market Expansion Program.
 - \$500 million appropriated 2023 through 2031.
 - Improves the loan process.
 - Increases the cost-share ratio to 75%.



HBIP OVERVIEW

- **Purpose:** This program seeks to market higher blends of biodiesel and ethanol by sharing the costs to build and retrofit biofuel-related infrastructure such as pumps, dispensers and storage tanks
- Applications are due by Nov. 21 at 4:30 PM ET
- Awards will be announced 90 days later (mid-Feb.)
- You can apply for up to \$5 million
- A 50% minimum match is required
- You have 36 months to complete the project
- Biodiesel blends greater than B5 (such as B20+) are eligible
- Renewable diesel is not eligible

WHAT ARE THE TWO CATEGORIES AND EXAMPLES?

- **Transportation Fueling Facility - \$75 million**
 - Fueling stations
 - Convenience stores
 - Hypermarket retailer fueling stations
 - Fleet facilities – automotive, freight, rail, and marine
 - Delivery vehicles
 - Municipalities
- **Fuel Distribution Facility - \$25 million**
 - Terminal operations
 - Midstream operations
 - Heating oil distribution facilities





HOW TO ACCESS THE ONLINE APPLICATION?

Instructions are on the USDA HBIIP website

1. Register for a Sam.Gov Account (UEI): [SAM.gov | Home](https://sam.gov)
2. Apply for an Authorized User Account:
<https://www.eauth.usda.gov/eauth/b/usda/home> *Be sure to obtain Level 2 Access by checking “Verified Identity” in your “Account Information”*
3. Complete the HBIIP Online Access Request Form:
https://www.rd.usda.gov/sites/default/files/HBIIP_Online_Access_Request_Fillable.pdf. *Add your grant writer.*



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OEM & FLEET SUPPORT FOR BIODIESEL





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OEM & FLEET BIODIESEL SUPPORT GROWING DUE TO:

- Growing volumes & availability
- Favorable policies – RFS, EPCACT, Tax Credits, etc.
- GHG emissions benefits
- Vehicle performance benefits
- ASTM specifications
- BQ-9000 biodiesel quality
- Corporate **E**nvironmental, **S**ocial, **G**overnance (ESG) Policies encouraging more sustainable practices
- Consumers and fleets want options that work best for their needs and budgets
- “Green” competitive advantage - easy and affordable way to green your fleet with existing diesel vehicles and infrastructure



BIODIESEL ASTM STANDARDS

ASTM D6751 is the approved standard for B100 for blending up to B20, in effect since 2001

- **Performance-based standard:** feedstock and process neutral

D975 – Covers petrodiesel and blends up to five percent biodiesel maximum for on/off road engines; in effect since 2008

D7467 – Covers blends containing six to twenty percent biodiesel (B6-B20) for on/off road engines, in effect since 2008

- Designed so that if B100 meets D6751 and petrodiesel meets D975, then B6 to B20 blends will meet their specifications
- Important quality control is at B100 level





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BQ-9000 QUALITY PROGRAM



- Biodiesel Industry's equivalent to an ISO 9000 program for biodiesel production & distribution companies as well as testing labs and retailers
- Clean Fuels industry implemented BQ-9000 as a means to help instill confidence in biodiesel with users and equipment companies
- There are now four BQ-9000 designations:
 - Producer (make it to spec)
 - Marketer (buy spec, keep it in spec, blend it right)
 - Certified Laboratories (test the fuel accurately)
 - Retailer (fuel quality management practices)
- Over 90 % of U.S. production is by a BQ-9000 Producer
- Many OEMs are now either requiring or strongly encouraging BQ-9000
- Organizations have seen economic advantages as more bids are requiring the certification





OEM BIODIESEL SUPPORT

- In the GVW Class 5-8 vehicles that account for 92% of on-road diesel fuel use, the vast majority of new diesel engines now have full OEM support for up to B20 biodiesel blends meeting ASTM standards with no vehicle modifications required
- OEM Biodiesel support level tends to follow the engine manufacturer's biodiesel support level
- Several OEMs already support B100 or are actively researching blends >B20 to assist their customers in meeting carbon reduction goals



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GROWING OEM SUPPORT FOR HIGHER BLENDS



“B20 is already in our lives today with many engines capable of running on it; the next step towards lowering emissions will be to have our engines run on B40 and then on B100, pure biodiesel.”

- Srikanth Padmanabhan –
President, Engine Segment, Cummins

“The vast majority of our engine models now accept B100, and we have updated Caterpillar’s Diesel Engine Fluids Recommendations to highlight B100 use.”

- Hind Abi-Akar –
Engineering Technical Steward,
Caterpillar



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FLEETS ARE MOVING BEYOND B20

Forward-looking fleets are using higher biodiesel blends to maximize the reduction in their carbon footprint using their new and existing diesel vehicles



- cleanfuels.org -

READY TO MAKE THE CHANGE? HOW TO REQUEST BIODIESEL IN YOUR VEHICLE BID SPECS

INCLUDE 'B20+ SUPPORT' IN THE PURCHASE SPECS FOR ALL THE ENGINES AND VEHICLES YOU BUY:

- Option A - STRONGEST: “All diesel vehicles must support a minimum level of Ultra Low Sulfur B20 biodiesel meeting ASTM fuel quality standards. Vehicles not supporting B20 will not be considered. Vehicles supporting blends higher than B20 will be given purchase preference.”
- Option B - INTERMEDIATE: “All diesel vehicles should support a minimum level of Ultra Low Sulfur B20 biodiesel meeting ASTM fuel quality standards. Vehicles supporting B20 will be given a purchase preference over those not supporting B20.”
- Option C - FLEXIBLE: “All diesel vehicles should support a minimum level of Ultra Low Sulfur B20 biodiesel meeting ASTM fuel quality standards. Vehicles supporting B20 may be given a purchase preference over those not supporting B20.”

Right Place, Right Time Accelerating the Transition to Lower Carbon Energy

Jon Scharingson - Executive Director, Strategic Initiatives

September 27, 2022



Cautionary Statement

This presentation contains forward-looking statements relating to Chevron's operations and energy transition plans that are based on management's current expectations, estimates and projections about the petroleum, chemicals and other energy-related industries. Words or phrases such as "anticipates," "expects," "intends," "plans," "targets," "advances," "commits," "drives," "aims," "forecasts," "projects," "believes," "approaches," "seeks," "schedules," "estimates," "positions," "pursues," "may," "can," "could," "should," "will," "budgets," "outlook," "trends," "guidance," "focus," "on track," "goals," "objectives," "strategies," "opportunities," "poised," "potential," "ambitions," "aspires" and similar expressions are intended to identify such forward-looking statements. These statements are not guarantees of future performance and are subject to certain risks, uncertainties and other factors, many of which are beyond the company's control and are difficult to predict. Therefore, actual outcomes and results may differ materially from what is expressed or forecasted in such forward-looking statements. The reader should not place undue reliance on these forward-looking statements, which speak only as of the date of this presentation. Unless legally required, Chevron undertakes no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

Among the important factors that could cause actual results to differ materially from those in the forward-looking statements are: changing crude oil and natural gas prices and demand for the company's products, and production curtailments due to market conditions; crude oil production quotas or other actions that might be imposed by the Organization of Petroleum Exporting Countries and other producing countries; technological advancements; changes to government policies in the countries in which the company operates; public health crises, such as pandemics (including coronavirus (COVID-19)) and epidemics, and any related government policies and actions; disruptions in the company's global supply chain, including supply chain constraints and escalation of the cost of goods and services; changing economic, regulatory and political environments in the various countries in which the company operates; general domestic and international economic and political conditions, including the military conflict between Russia and Ukraine and the global response to such conflict; changing refining, marketing and chemicals margins; actions of competitors or regulators; timing of exploration expenses; timing of crude oil liftings; the competitiveness of alternate-energy sources or product substitutes; development of large carbon capture and offset markets; the results of operations and financial condition of the company's suppliers, vendors, partners and equity affiliates, particularly during the COVID-19 pandemic; the inability or failure of the company's joint-venture partners to fund their share of operations and development activities; the potential failure to achieve expected net production from existing and future crude oil and natural gas development projects; potential delays in the development, construction or start-up of planned projects; the potential disruption or interruption of the company's operations due to war, accidents, political events, civil unrest, severe weather, cyber threats, terrorist acts, or other natural or human causes beyond the company's control; the potential liability for remedial actions or assessments under existing or future environmental regulations and litigation; significant operational, investment or product changes undertaken or required by existing or future environmental statutes and regulations, including international agreements and national or regional legislation and regulatory measures to limit or reduce greenhouse gas emissions; the potential liability resulting from pending or future litigation; the company's future acquisitions or dispositions of assets or shares or the delay or failure of such transactions to close based on required closing conditions; the potential for gains and losses from asset dispositions or impairments; government mandated sales, divestitures, recapitalizations, taxes and tax audits, tariffs, sanctions, changes in fiscal terms or restrictions on scope of company operations; foreign currency movements compared with the U.S. dollar; material reductions in corporate liquidity and access to debt markets; the receipt of required Board authorizations to implement capital allocation strategies, including future stock repurchase programs and dividend payments; the effects of changed accounting rules under generally accepted accounting principles promulgated by rule-setting bodies; the company's ability to identify and mitigate the risks and hazards inherent in operating in the global energy industry; and the factors set forth under the heading "Risk Factors" on pages 20 through 25 of the company's 2021 Annual Report on Form 10-K and in subsequent filings with the U.S. Securities and Exchange Commission. Other unpredictable or unknown factors not discussed in this presentation could also have material adverse effects on forward-looking statements.

As used in this presentation, the term "Chevron" and such terms as "the company," "the corporation," "our," "we," "us" and "its" may refer to Chevron Corporation, one or more of its consolidated subsidiaries, or to all of them taken as a whole. All of these terms are used for convenience only and are not intended as a precise description of any of the separate companies, each of which manages its own affairs.

Terms such as "resources" may be used in this presentation to describe certain aspects of Chevron's portfolio and oil and gas properties beyond the proved reserves. For definitions of, and further information regarding, this and other terms, see the "Glossary of Energy and Financial Terms" on pages 24 through 25 of Chevron's 2021 Supplement to the Annual Report available at chevron.com.

CHEVRON RENEWABLE ENERGY GROUP OVERVIEW

Who We Are

Leading now. Continuing to grow for the future.

1300

1300 EMPLOYEES
AROUND THE WORLD

44 | 19

PRODUCT SOLD IN 44 STATES
AND 19 COUNTRIES IN 2021



11 | 1

11 BIOREFINERIES
INCLUDING 1 RENEWABLE
DIESEL BIOREFINERY

621 

621 MILLION GALLONS¹
SOLD IN 2021

\$3.2

BILLION IN REVENUE
based on 2021 sales

¹ Two million metric tonnes

Portfolio of Services and Lower Carbon Solutions

Leading-edge quality, go-to-market agility, sensible decarbonization methods and sustainable partnerships set us apart.

Our sustainable fuels help significantly lower greenhouse gas emissions to immediately reduce carbon impact.

+ EnDura™ Fuels

- B20-B50 Blends
- RD/BD 100% Renewable
- B100 Biodiesel
- SAF

+ Renewable Propane

+ Renewable Naphtha

+ Diesel

+ Last-Mile Delivery

+ Bulk Fuel

+ Cardlock and Retail

+ Wet Hosing

+ Tanks and Dispensers

+ Fuel Testing

+ Grants



InfiniD™ is a high-quality biofuel for use in virtually all conventional diesel applications

	<p>Enables decarbonization today with much lower Carbon Intensity (CI) than petroleum diesel</p>
	<p>Sustainable oxygenated fuel option that can improve combustion quality and lubricity of petroleum fuels</p>
	<p>Lower carbon engine <u>emissions</u>: decreases harmful pollutants in tailpipe emissions from legacy engines and reduces the burden on New Technology Diesel Engines (NTDE) emissions control systems (fewer DPF regenerations, for example)</p>
	<p>Compared to petroleum diesel, can reduce engine emissions by:</p> <ul style="list-style-type: none"> + Up to 100% for fossil carbon¹ + Up to 70% for total hydrocarbon^{2, 3} + Up to 70% for particulate matter³

¹ Product is produced utilizing 100% renewable oils and fats. Methanol used to make biodiesel and hydrogen used to make renewable diesel and SAF are typically made from conventional natural gas.

² https://afdc.energy.gov/vehicles/diesels_emissions.html

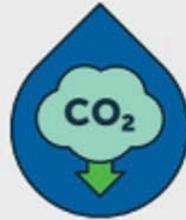
³ Reductions based on emissions data from California Air Resources Board and compared to U.S. federal ULSD, (Durbin, et al., 2011)



VelociD™ is a lower carbon, ultra-high Cetane hydrocarbon renewable fuel that can serve as a direct replacement to petroleum diesel.



Stringent quality standards that exceed ASTM, CEN and CGSB specification requirements



Lower Carbon Intensity (CI) enables decarbonization today



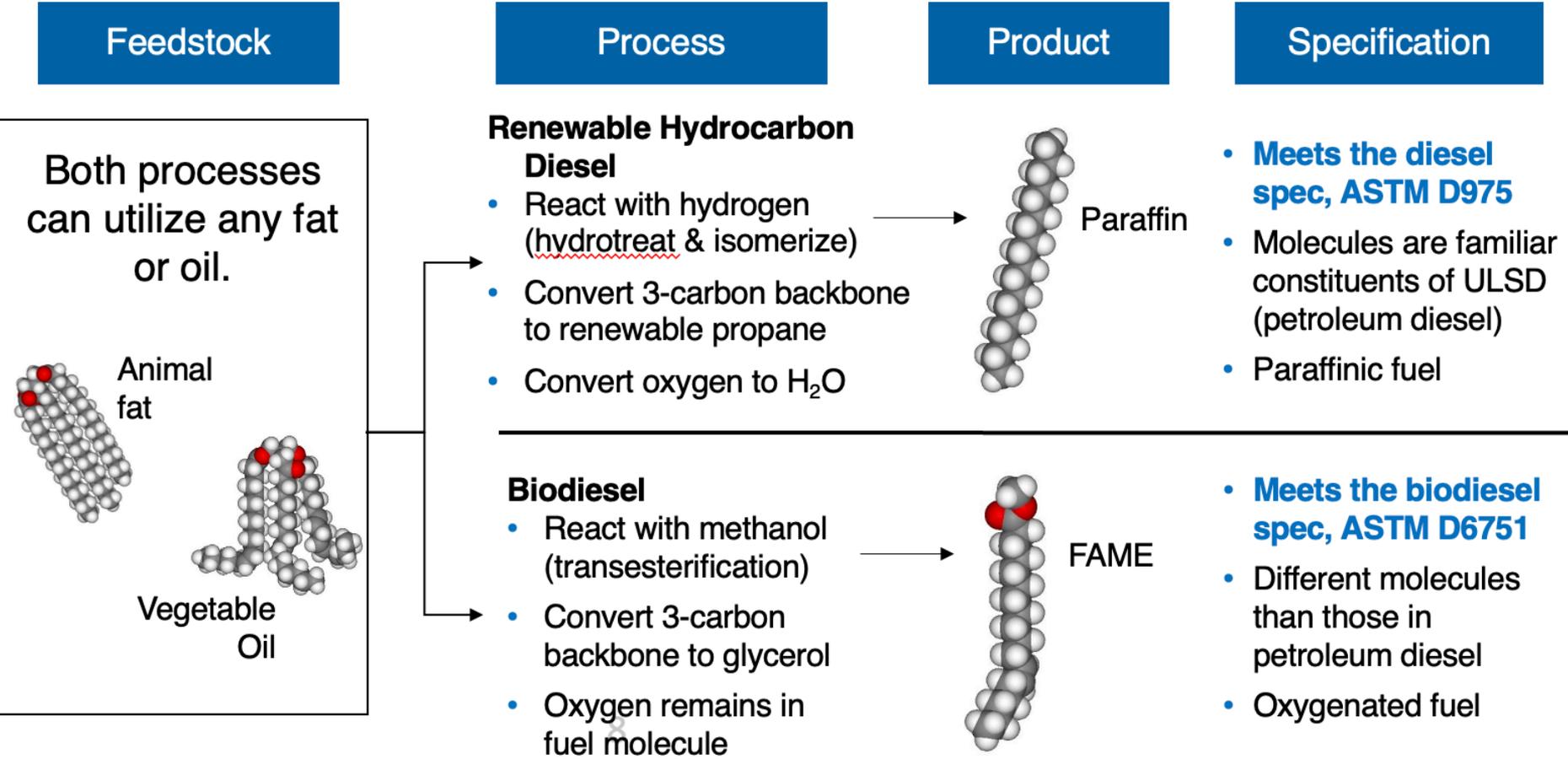
Compared to petroleum diesel, VelociD™ can reduce engine emissions by:

- + Up to 100% for fossil carbon¹
- + Up to 40% for particulate matter²
- + Approximately 15% for nitrogen oxides (NOx)²

¹ Product is produced utilizing 100% renewable oils and fats. Methanol used to make biodiesel and hydrogen used to make renewable diesel and SAF are typically made from conventional natural gas, but can be produced from renewable resources.

² Reductions based on emissions data from California Air Resources Board and compared to U.S. federal ULSD, (Durbin, et al., 2011)

Comparing biodiesel & renewable diesel





UltraClean BlendD™ is a proprietary, 100% renewable fuel¹ combination of VelociD™ and PuriD™ that allows decarbonization today in virtually any diesel application.



Superior lubricity to renewable diesel and can even have a lower freezing point



Carbon Intensity (CI) scores that are much lower than petroleum diesel allow for decarbonization today



UltraClean BlendD™ can provide the lowest overall engine emissions of any diesel fuel option



Elastomer swell, density and bulk modulus properties of UltraClean BlendD™ are a better match for conventional diesel than 100% renewable diesel

¹ Product is produced utilizing 100% renewable oils and fats. Methanol used to make biodiesel and hydrogen used to make renewable diesel and SAF are typically made from conventional natural gas.

Lower Carbon Solution Available at Scale Now

Providing Cleaner Fuel Solutions for Over Two Decades



**Waste & Byproduct
Fats & Oils**

*Renewable Lower-
Carbon Feedstock*



**5.5X Energy
Return Ratio¹**

*Proprietary Refining
Technology*



**95-100% Scope 1 & 2
GHG Emissions²**

*Biodiesel (BD)
Renewable Diesel (RD)*



**Downstream
Distribution**

*Growing Distribution
Network*

Source:

1. NBB; Defined as units of energy returned per unit of fossil used for production

2. EPA Lifecycle Greenhouse Gas Emissions for Select Pathways

REG is Reducing Carbon at Scale



4.1 MILLION
METRIC TONS

OF CARBON REDUCTION¹

FROM AN ESTIMATED 480 MILLION GALLONS OF BIO-BASED DIESEL PRODUCED IN 2021

EQUIVALENT TO



GHG EMISSIONS FROM

10.2 BILLION
MILES

DRIVEN BY AN AVERAGE
PASSENGER VEHICLE²



CO₂ EMISSIONS FROM

4.5 BILLION
POUNDS

OF COAL BURNED²



CO₂ SEQUESTERED BY

5.0 MILLION
ACRES

OF U.S. FORESTS
IN ONE YEAR²



CO₂ EMISSION REDUCTION FROM

1.2 MILLION

PASSENGER ELECTRIC VEHICLES
ON THE ROAD IN ONE YEAR³

(1) Carbon reduction based on life cycle analysis of REG-produced fuels versus petroleum diesel.

(2) [EPA.gov/energy/greenhouse-gas-equivalencies-calculator](https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator)

(3) Assumes annual travel of 11,484 miles/year and national grid average electricity versus gasoline using CA-GREET

Achieve Significant GHG Impact

REG bio-based diesel can reduce carbon emissions more than CNG-fueled or electric vehicles.



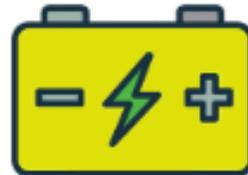
88%

v. Diesel⁽¹⁾



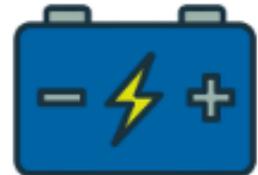
85%

v. CNG⁽¹⁾



65%

v. EV and US grid
average electricity⁽¹⁾



42%

v. EV and CA grid
average electricity⁽¹⁾

Source: Company.

⁽¹⁾ Carbon reduction compared to REG's best-in-class biodiesel plant Albert Lea using UCO with life cycle analysis based on CA-GREET 3.0; utilized EV EER of 5.0 for heavy duty vehicles.

Our Customers

We help our customers work toward meeting their sustainability targets sooner and make our world more sustainable.





9.27.22 Product Feature: Decarbonizing Heavy-Duty Fleets

Colin Huwyler, CEO || c.huwyler@optimustec.com || 412.727.8228 x2



Lowest Emissions

- Near-zero carbon emissions
- 50%+ less particulate matter

Renewable, Sustainable, & Scalable

- Derived from sustainable sources
- Solar energy (photosynthesis vs. photovoltaics)
- Accessible at scale via existing infrastructure

Lowest Cost

- Competitive pricing to petroleum diesel
- Significantly lower cost than RHD, electrification, hydrogen, etc.

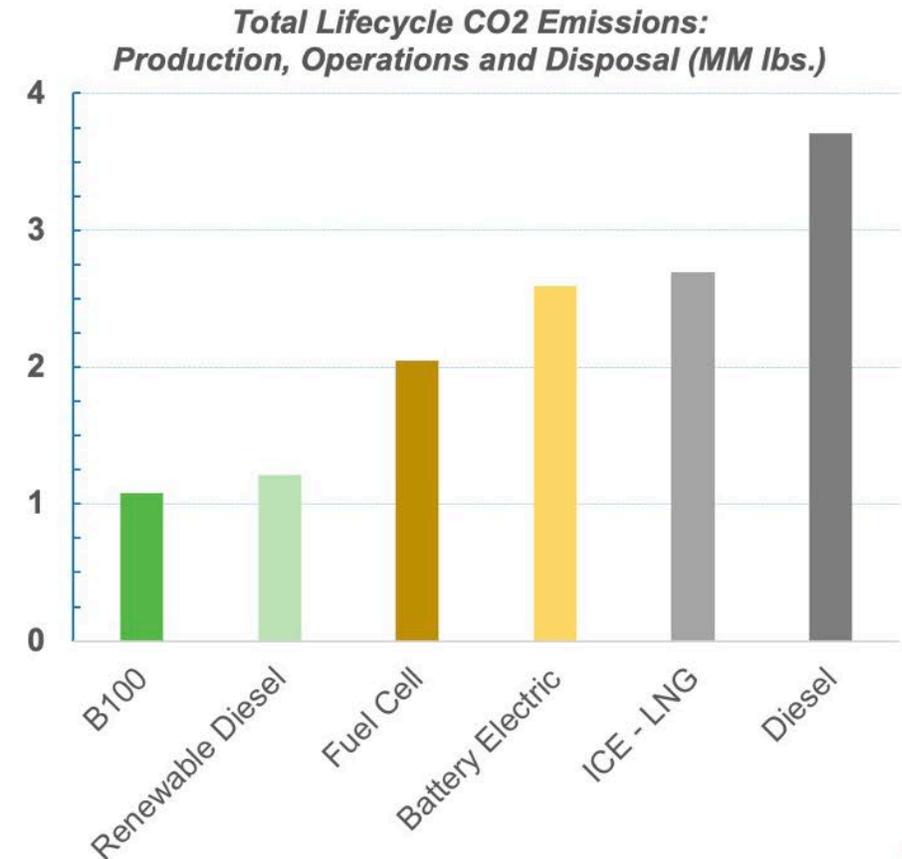
Safer & More Efficient

- Better lubricity, higher flashpoint, biodegradable, etc.

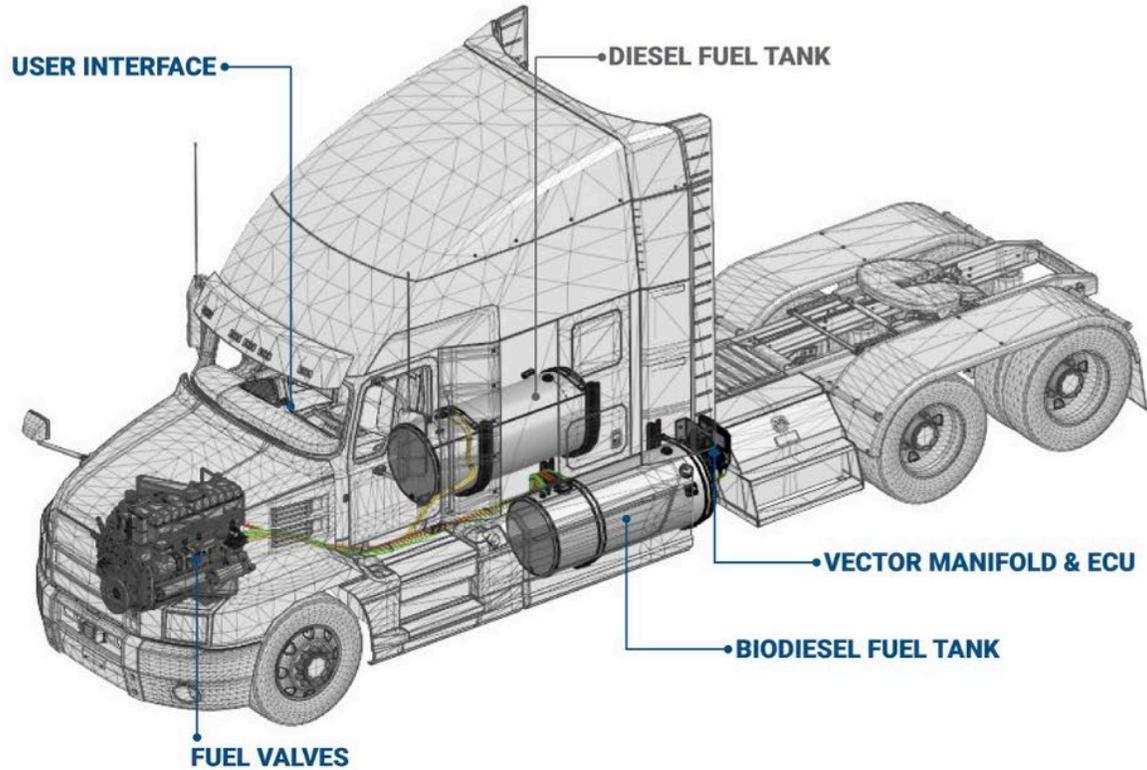


THE LOWEST CO₂ OPTION & AVAILABLE TODAY

*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**.*



VECTOR SYSTEM OVERVIEW



- FULLY AUTOMATED - NO USER ENGAGEMENT
- RISK MITIGATION VIA FUEL SWITCHING
- NO RANGE OR REFUELING ANXIETY
- RETROFIT OR INTEGRATED FACTORY NEW OPTIONS
- FLEET & APPLICATION AGNOSTIC
- EPA COMPLIANT & CARB EOs ISSUED
- ELIGIBLE FOR A VARIETY OF GRANT FUNDING PROGRAMS





“The Iowa Department of Transportation is becoming a global leader in carbon reductions while taking the next steps forward toward the state’s sustainability goals, this is coming to fruition as a result of Optimus’ advanced technology coupled with fuels produced right here in Iowa.”

- Todd Cogdill, Fleet Manager





“This study [Immediate Decarbonization of Class 8 Trucking] helped to give us and other fleets the data they need to feel secure in implementing the Vector System with B100 to enhance sustainability efforts without sacrificing efficiencies.”

- Steve Finn, ADM Vice President of Transportation





“The Preferred Choice”

“DC Mayor Muriel Bowser says cutting carbon isn’t an option. It is something we must do... Heavy-duty electric options are extremely expensive and aren’t ready for wide deployment yet. Optimus has given us the ability to cut our carbon beyond our reduction goals.”

- Christine Davis, Former Director DC Public Works





“Biodiesel gives us the ability to immediately reduce the carbon emissions in our fleet... The truth is, for these bigger vehicles that carry huge loads and run long hours, electrification just isn’t ready or widely available yet...

The Optimus Vector System offers a path forward that is available today.”

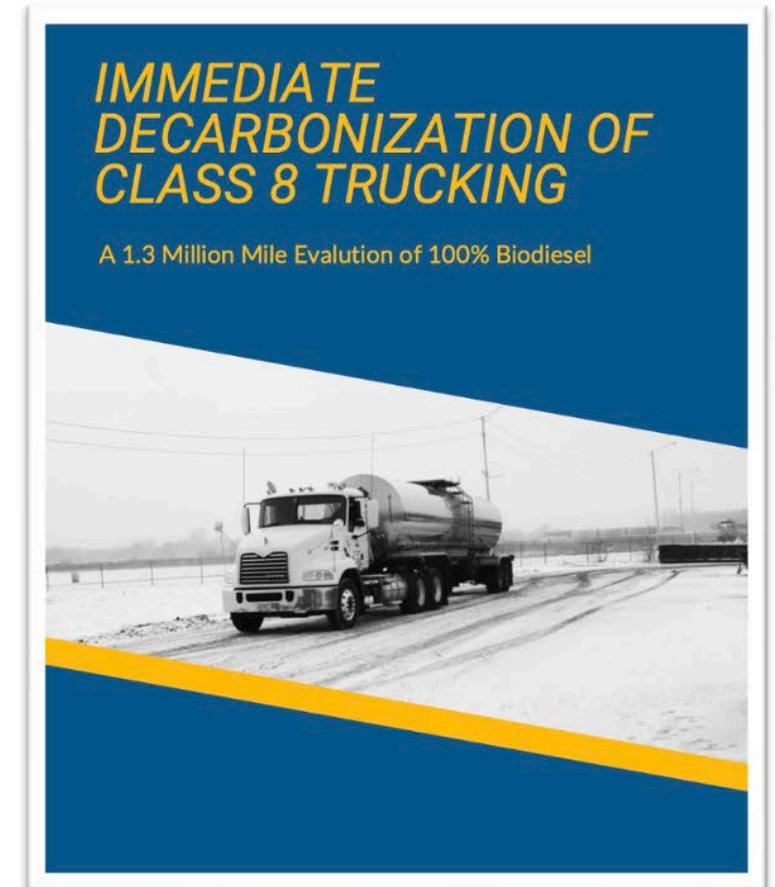
- Mahanth Joishy, Superintendent of Fleet Services



1.3MM MILE FLEET STUDY W/ADM TRUCKING

- 1,000,000+ mile study
- Optimus/B100 fuel economy better than diesel
- 900+ metric tons of scope 1 carbon emissions reduced
- Validated significant improvement in diesel particulate filter (DPF) performance and operation
- Improvement in monitored parameters of engine oil
- Achieved parity on cost of maintenance vs. diesel
- Validated no impact on operations or performance of trucks

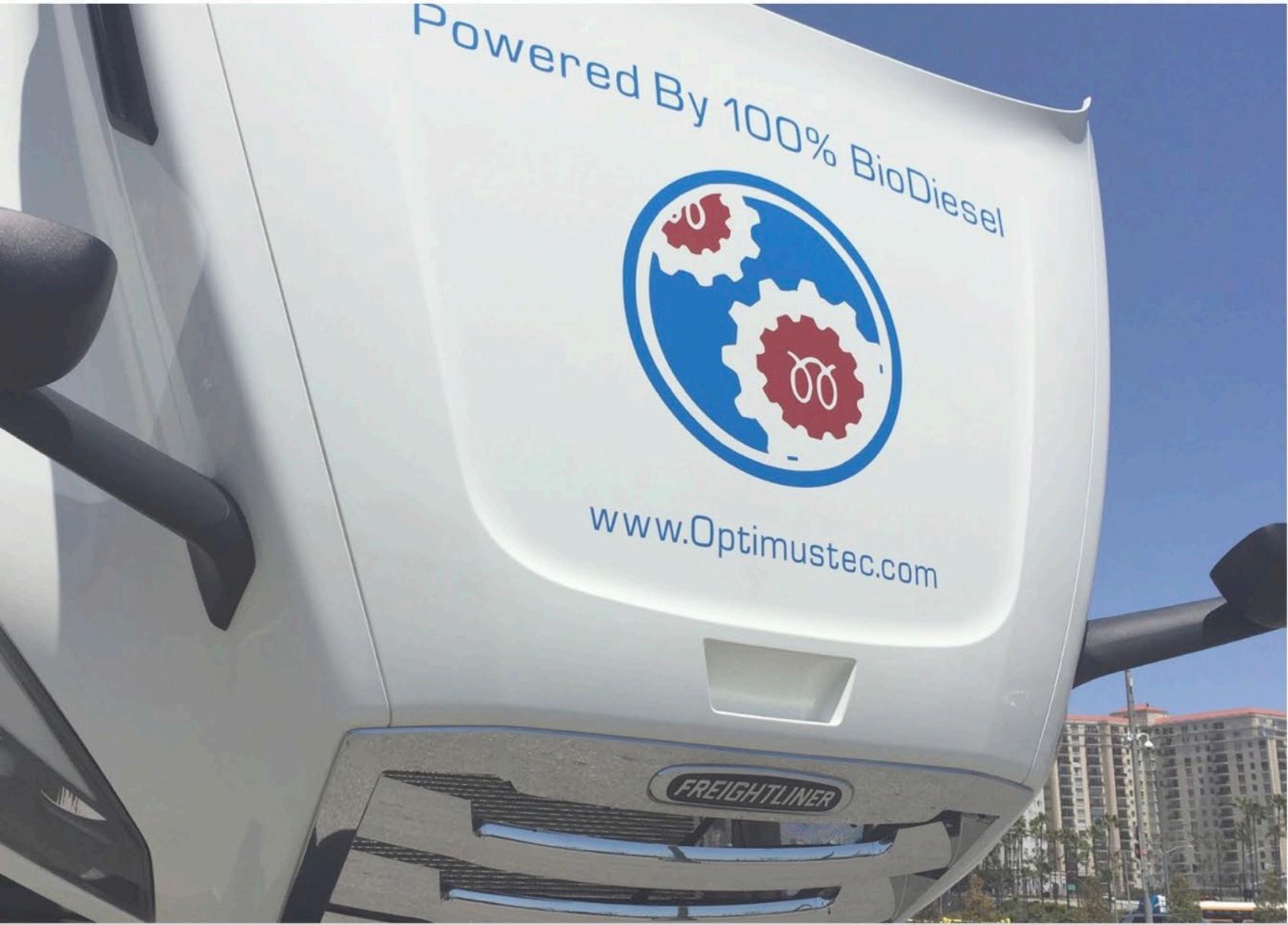
Full details of study to be publicly released October 19th.



Sign up for early access today: at www.optimustec.com/adm



NEAR-ZERO CARBON EMISSIONS... TODAY!



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KEY TAKEAWAYS:

- The Time Value of Carbon is key, and the next decade is critical.
- Biodiesel and Renewable Diesel are readily available to go to work NOW to reduce the Cumulative Carbon Impact the most over the next 10 years and beyond, vs. waiting years for electric and fuel cell technology and infrastructure to become affordable and viable.
- Corporate sustainability goals and numerous federal and state policies are driving fleets to use higher blends and volumes of low-carbon biodiesel and renewable diesel fuels.
- Biodiesel blends up to B20 can be used in existing diesel equipment with no modifications required. Optimus Technologies' Vector System upfit allows use of up to B100 biodiesel year-round with minimal investment compared to EVs.



Clean Fuels
ALLIANCE AMERICA

QUESTIONS?

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• Visit Us Online:

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- www.regi.com
- www.optimustec.com

• Join us at the 2023 Clean Fuels Conference:

- January 23-26, 2023 in Tampa, FL
- www.CleanFuelsConference.org

