Winter Webinar Series

Webinar: Clean Diesel Applications

Wednesday, March 17, 2021 | 11 a.m. - 12 p.m. CDT

CHICAGO AREA CLEAN CITIES

South Shore Clean Cities, Inc.
NORTHERN INDIANA

Greater Lansing Area Clean Cities

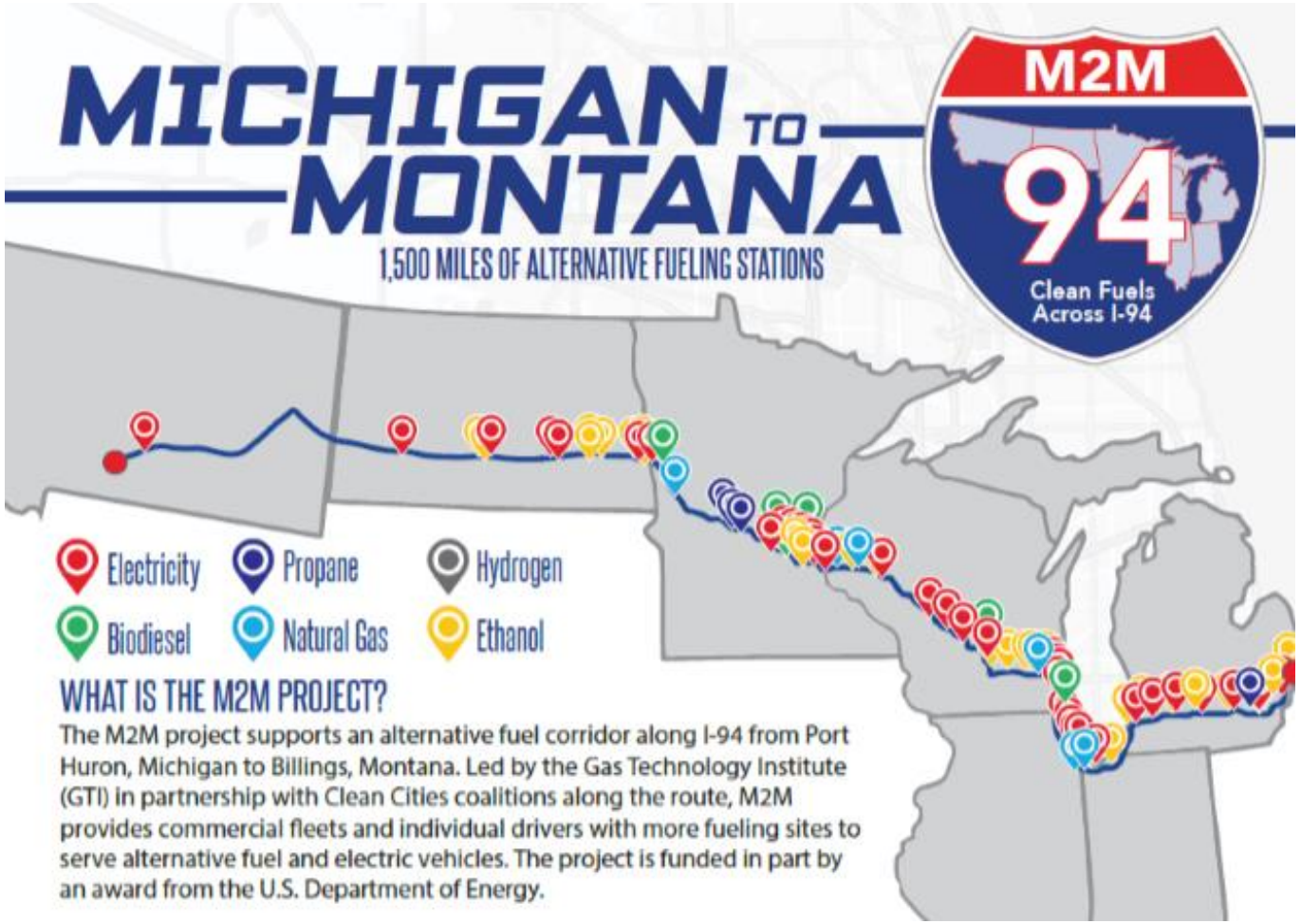
WISCONSIN CLEAN CITIES
Established 1994

Clean Cities

Lorrie Lisek
Executive Director
Wisconsin Clean Cities

Grant Funding

M2M I-94 Clean Fuel Corridor



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WISCONSIN CLEAN CITIES
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Update on Diesel Technology

March 17, 20121

Ezra Finkin
Policy & Outreach Director

The Diesel Technology Forum

CURRENT STATE OF DIESEL TECHNOLOGY

IMMEDIATE TERM CLEAN AIR AND CLIMATE BENEFITS

ADVANCED BIOFUELS DELIVERING BIG ON CLIMATE

DIESEL PRODUCTION IN THE MIDWEST

THE FUTURE FOR DIESEL TECHNOLOGY

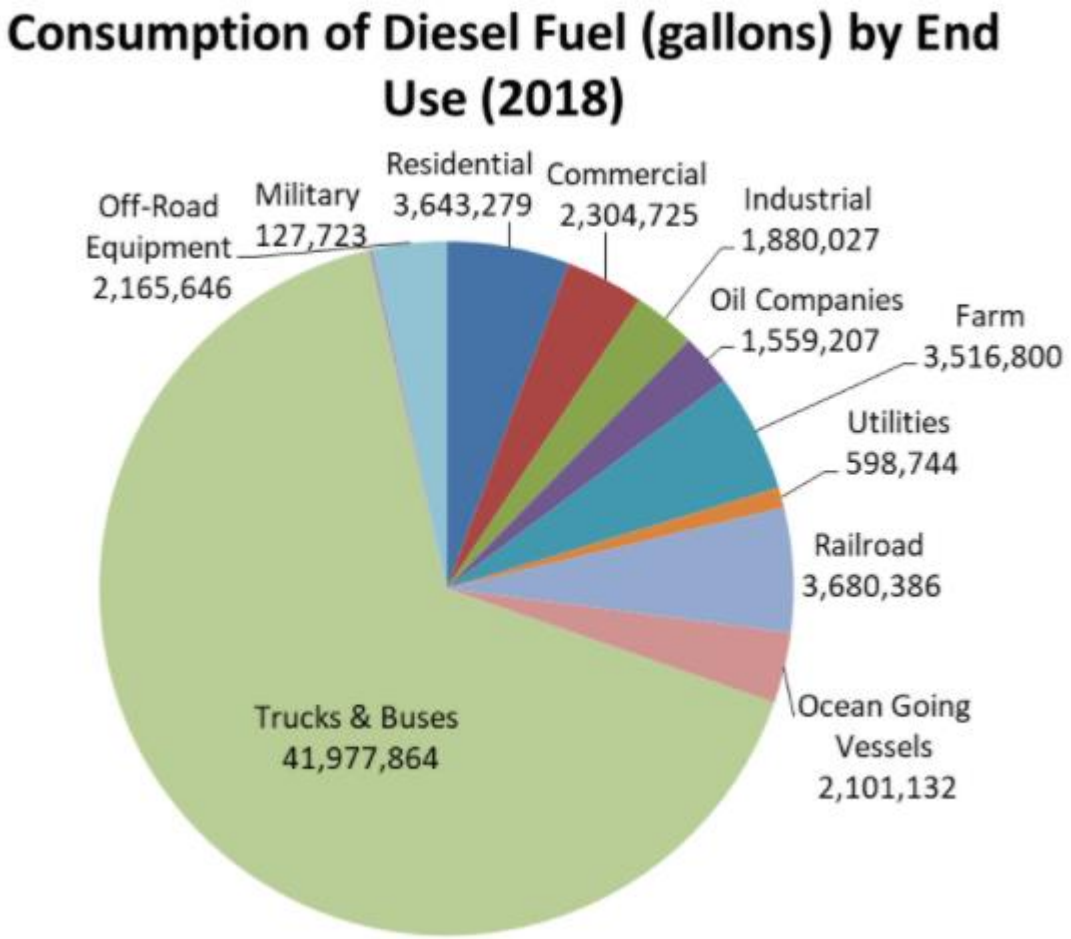
DIESEL TECHNOLOGY FORUM

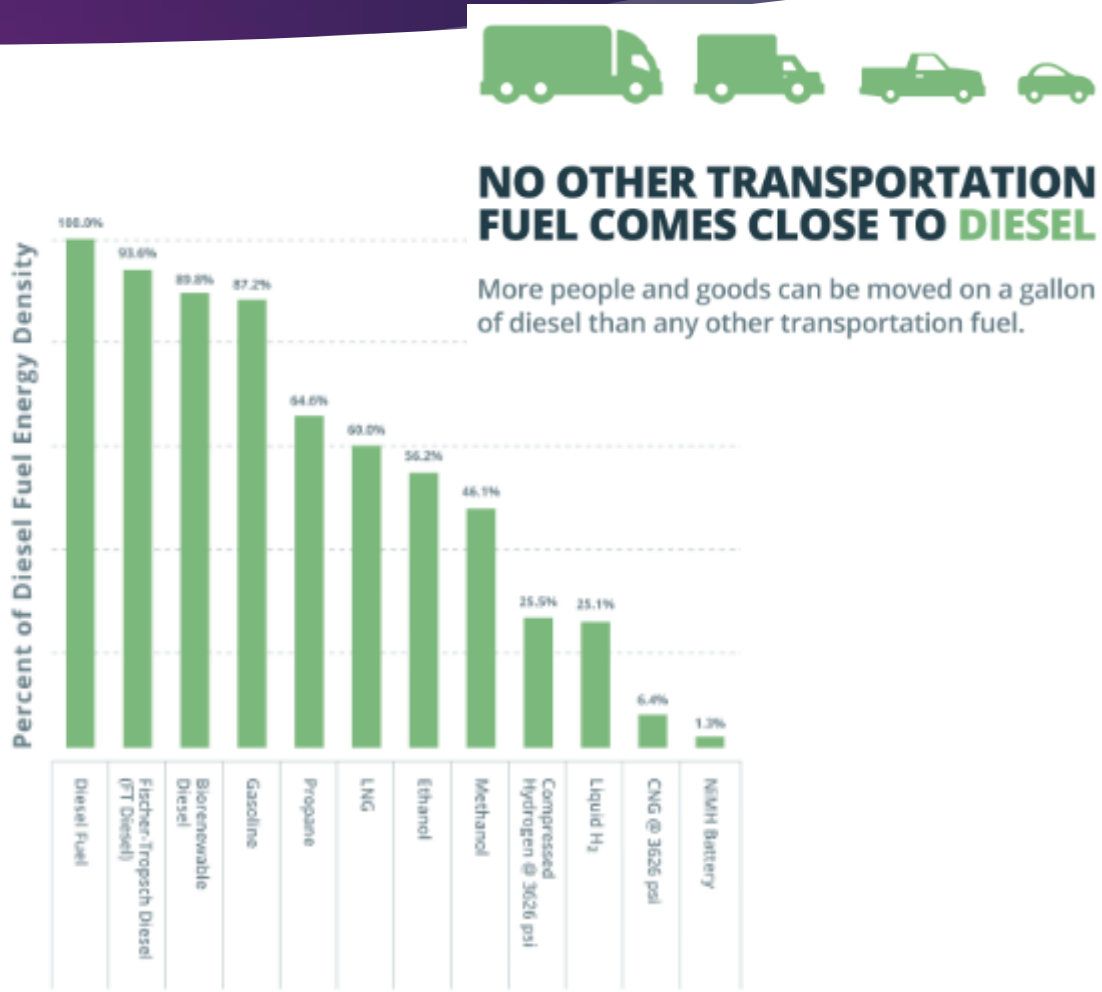
About us. We represent Leaders in Clean Diesel Technologies:

Engines, Equipment, Suppliers, Fuels, Allied organizations

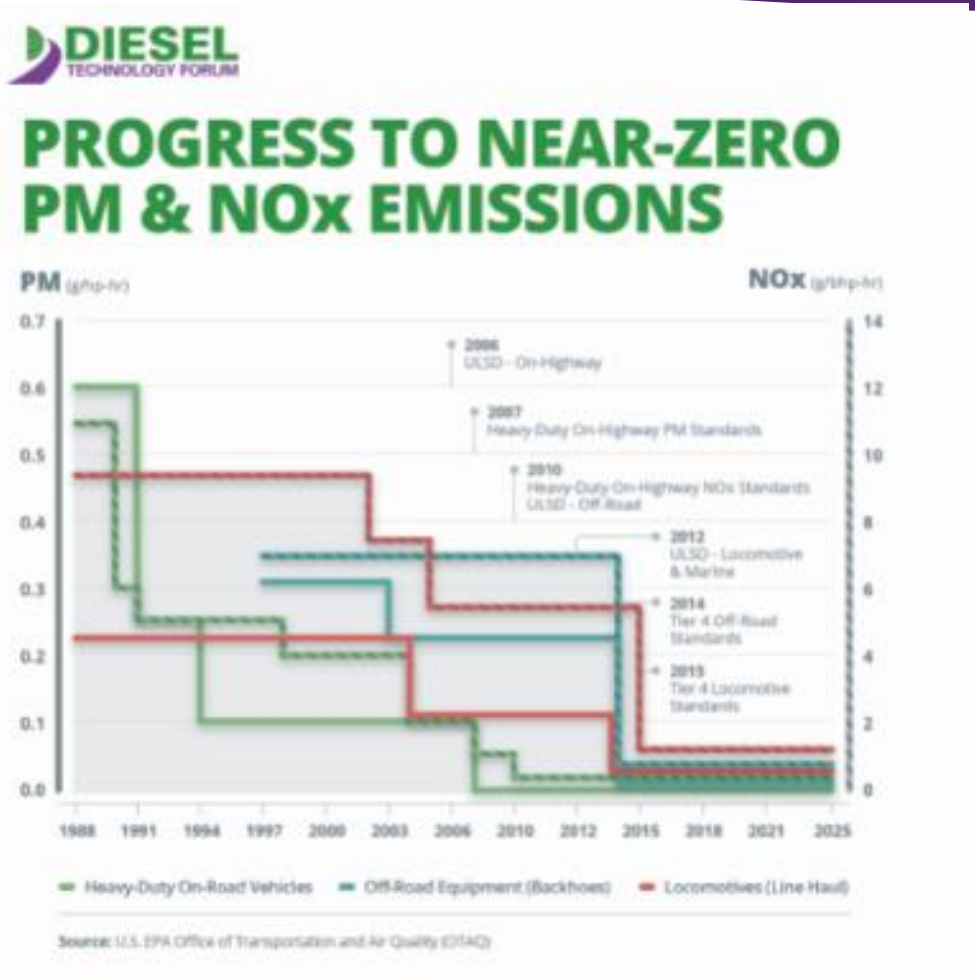
AGCO Your Agriculture Company
CATERPILLAR
CNH INDUSTRIAL
Cummins
Old World Industries
JOHN DEERE
FCA FIAT CHRYSLER AUTOMOBILES
GM
ISUZU
JM Johnson Matthey Inspiring science, enhancing life
mazda
mtu
BIODIESEL America's Advanced Biofuel
NESTE
REG Renewable Energy Group
BOSCH Invented for life
TENNECO
umicore Automotive Catalysts
VOLVO
WSPA
YANMAR

Diesel Fuel & Engines Power Our Economy





Progress to Near Zero Emissions from Diesel Technology



Trucks
Buses
Locomotives
Construction Equipment
Ag Equipment
Industrial Engines
Marine Vessels

=

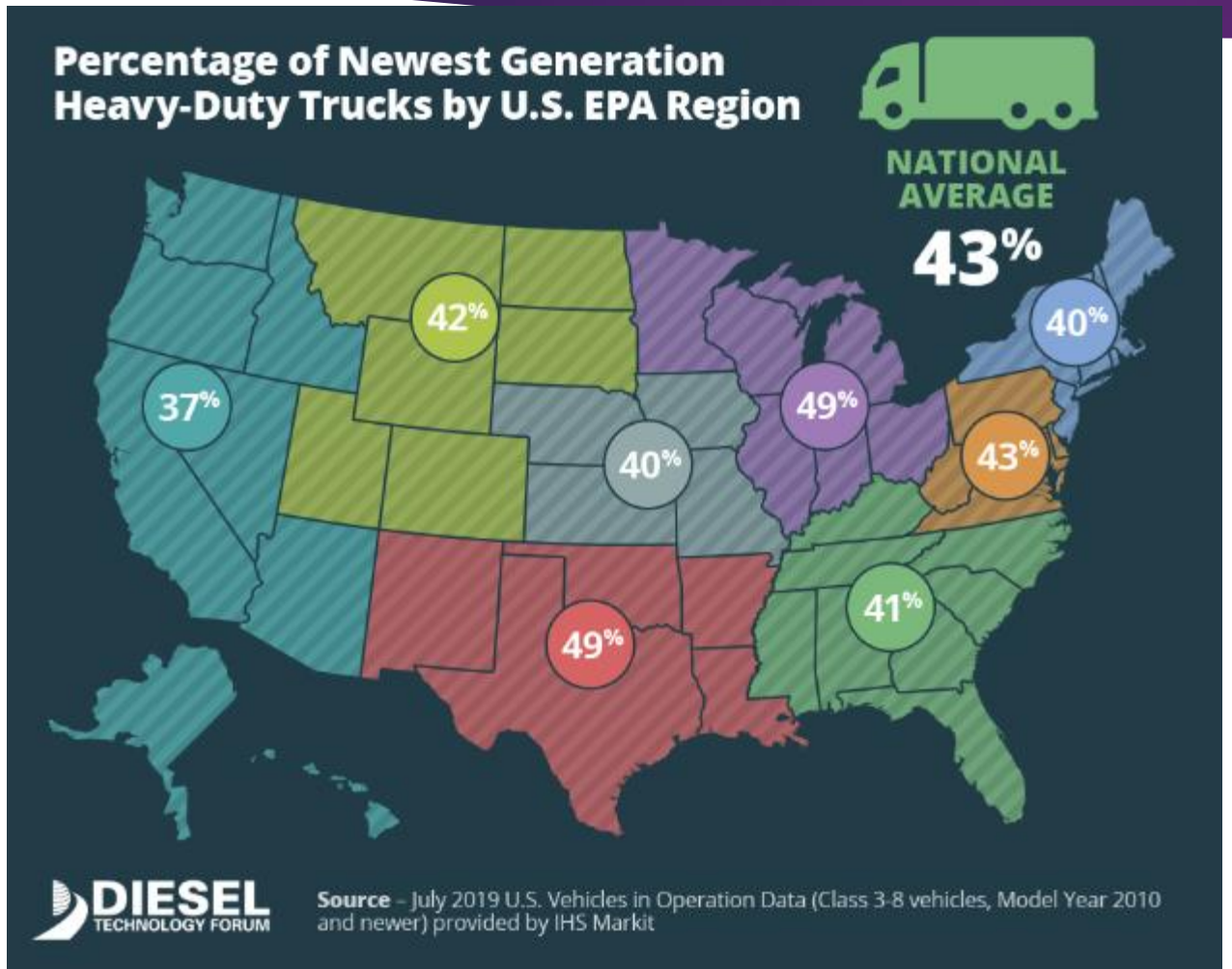
Near-Zero Emissions Available Today

New Class 8 Trucks Deliver Big Clean Air Benefits

Replace an Old Generation Class 8 Truck with New Diesel Option Today….

Eliminate **2.3 tons of NOx emissions,** over **250 lbs of fine particle emissions** and almost **10 tons of Co2**

Midwest is a Leader When it Comes to Adoption of Clean Technologies



A greater share of near-zero emissions trucks and buses are on the road across the Midwest deliver clean air benefits

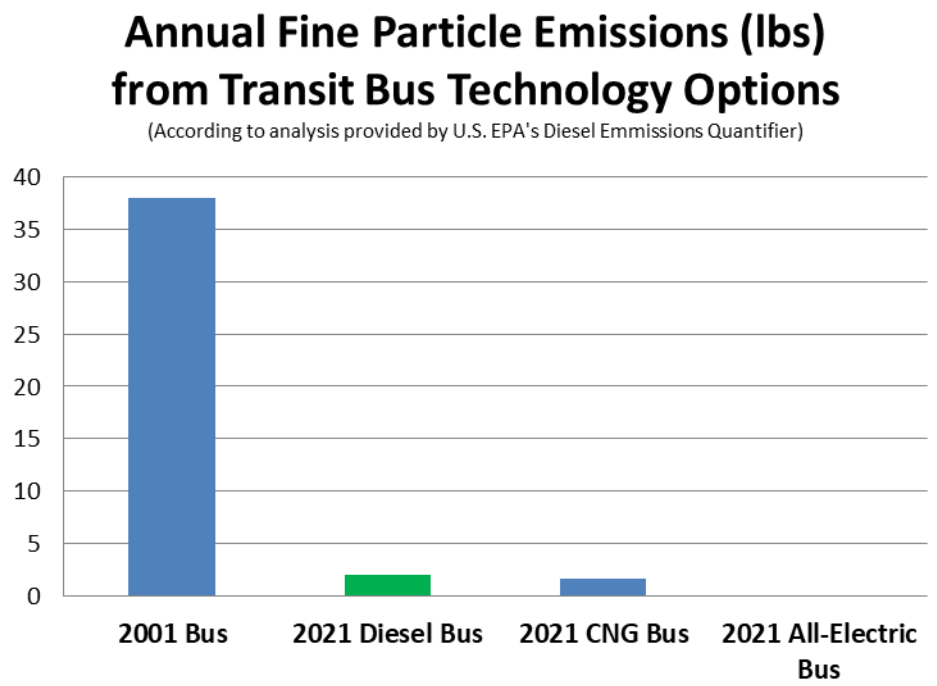
Clean Diesel Buses Deliver Clean Air Benefits

CHICAGO SUN-TIMES

CTA to buy 600 new 'clean-diesel' buses to replace aging fleet

In the next two years, nearly 70% of CTA buses will be beyond their useful life.

When replacing a 20-year old bus fleet…. 600 new diesel buses will eliminate 11 tons of PM emissions

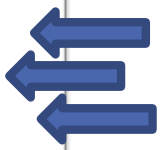


DIESEL TECHNOLOGY FORUM

Midwest is a Clean Manufacturing Hub

Ranking	State	Number of Heavy-Duty Diesel Engines
#1	NC	327,500
#2	IN	160,985
#3	MI	109,000
#4	OH	70,000
#5	NY	76,400
#6	MD	40,000
#7	TX	29,800
#8	IA	28,750
#9	MS	28,700
#10	GA	12,700
#11	AL	7,200
#12	UT	1,600
#13	SC	940

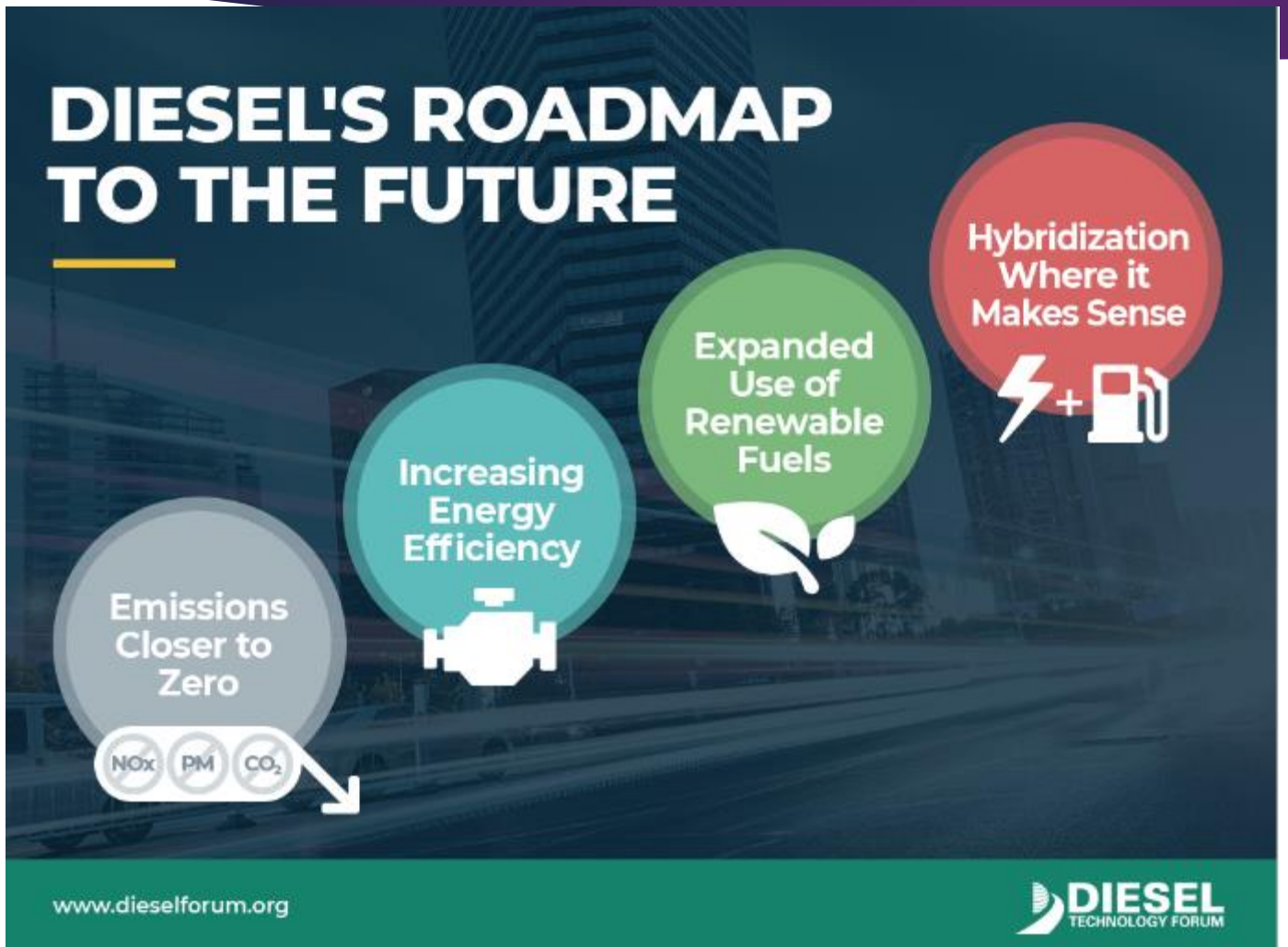
SOURCE: Rhein & Assoc.



340,000 heavy-duty diesel engines manufactured in the Midwest in 2019.

More than one in every three heavy-duty diesel engine manufactured in the US came out of a facility in the Midwest.

Diesel is Part of Our Climate & Clean Air Future



While zero-emissions solutions are planned for the future, let's do what we can today to reduce emissions. Why should we wait when we have low carbon solutions ready to go now

Closer to Zero Solutions and Fuel Economy Standards will Deliver in the Short Term

EPA United States Environmental Protection Agency

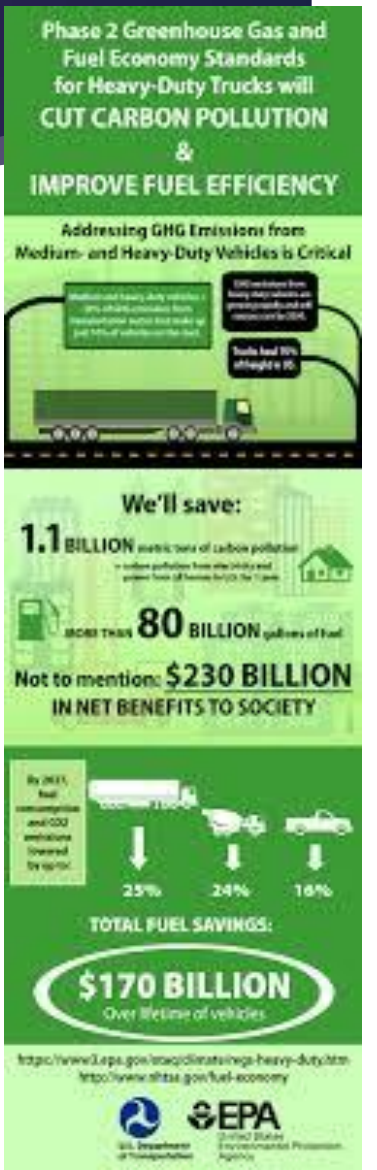
Cleaner Trucks Initiative

Taking near-zero emissions tailpipe standards closer to zero

Phase 2 Fuel Economy Rules for Trucks Kicks-in this year!!

2021 – 2027: Over 1 billion tons of Co2 reduced through more efficient trucks.

Diesel will make up the majority of truck sales!!



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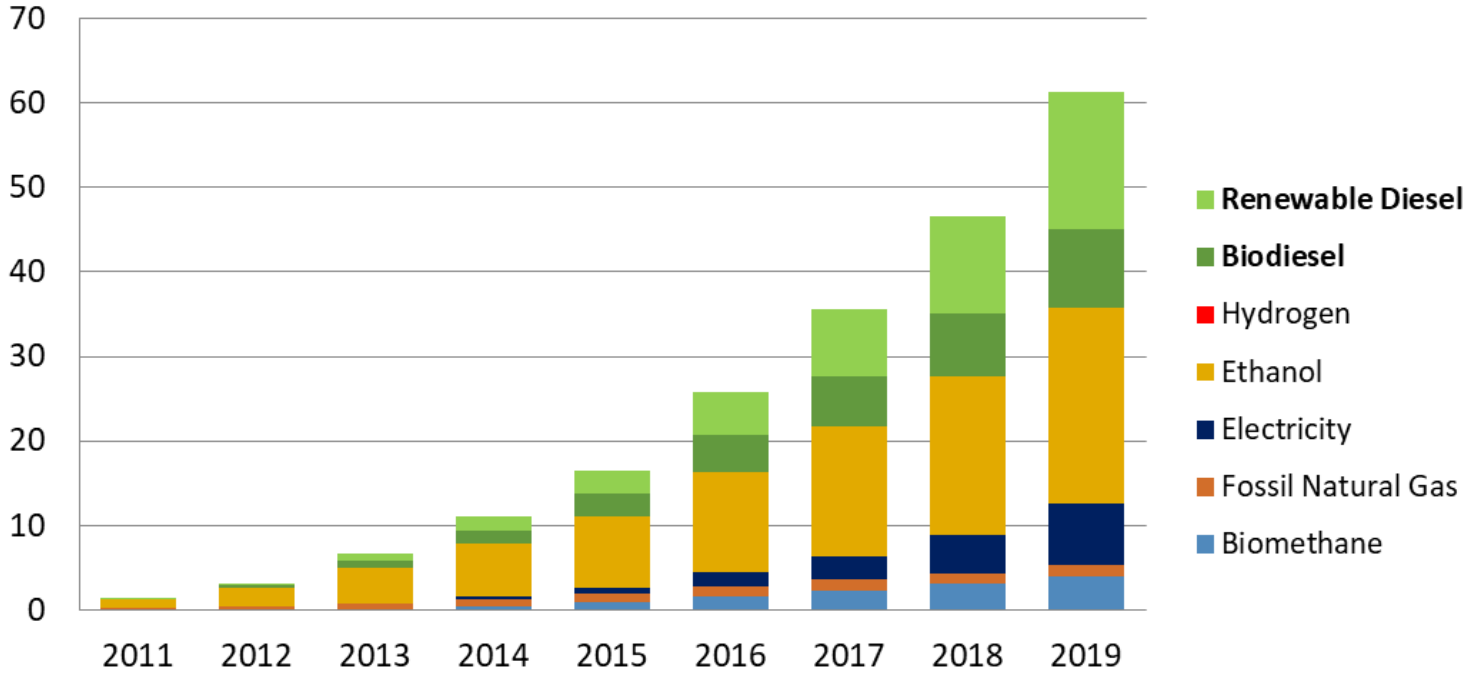
Big Climate Benefits from Biofuels

Cumulative C02 Reductions (million tons)

SOURCE: California Energy Commission, Low Carbon Fuel Standard Dashboard



More Transportation Sources of GHG Emissions Have Been Eliminated in CA Through the Use of Biodiesel & Renewable Diesel Fuel.

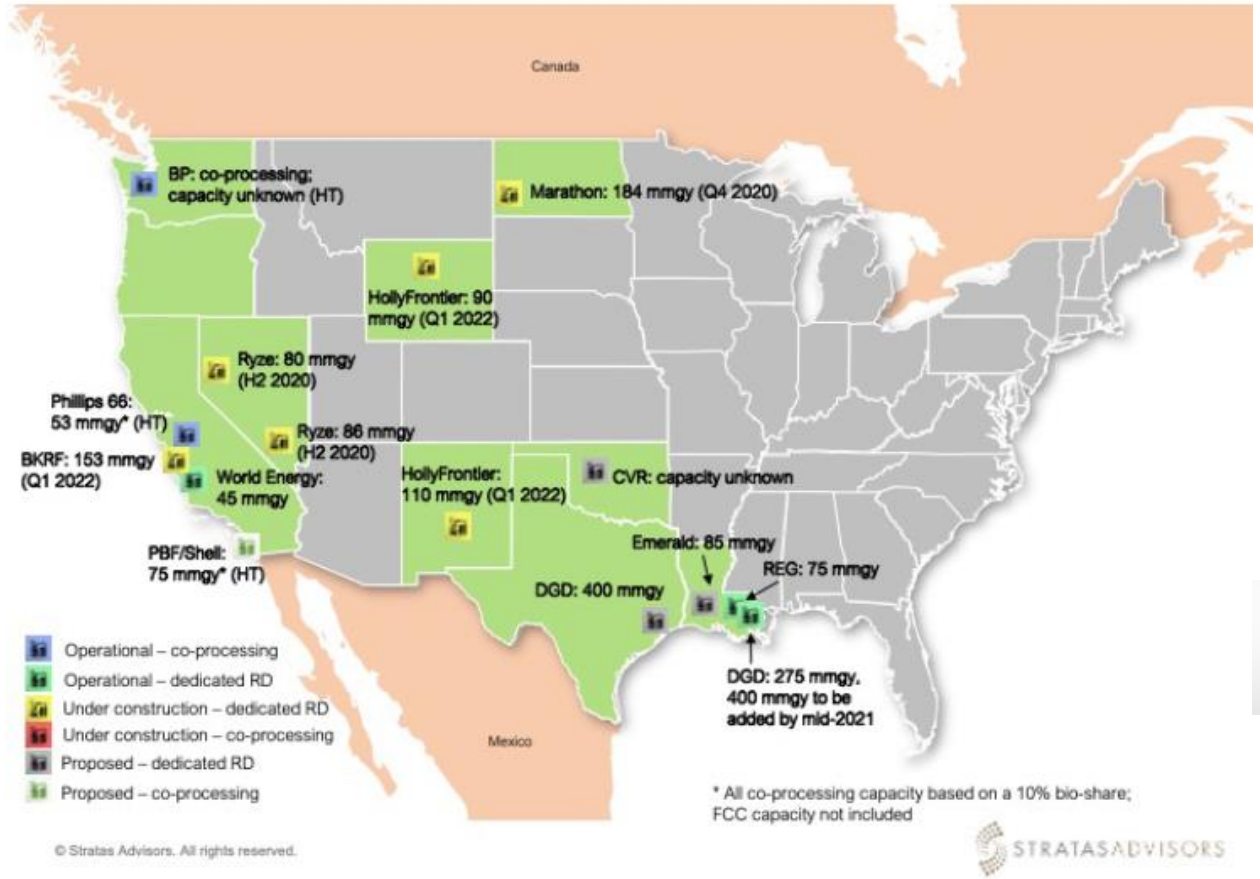
Beats Electrification of Cars, Trucks and Buses by almost 4:1!

It Takes a Diesel Engines to Realize These Benefits

DIESEL TECHNOLOGY FORUM

CALIFORNIA AIR RESOURCES BOARD

Oil Majors are Noticing Benefits of Renewable Diesel Fuel



Oil Majors Are Getting into the Renewable Diesel Game!!!

Announced Petroleum Refineries Retooling to Produce Renewable Diesel Fuel.

If actual production yields meets planned production ….equals all petroleum diesel consumed in California in 2019.

STRATAS ADVISORS

https://stratasadvisors.com/Insights/2020/06112020LCFS-RD-Investment

Hybrids Deliver Near-Zero Emissions & Fuel Savings Benefits

Hybrid and Energy Storage Solutions Are Part of the Future Including from the Hard-to-Decarbonize Sector

DIESEL TECHNOLOGY FORUM

Thank You!

Ezra Finkin
Director for Policy & Outreach

Efinkin@dieselforum.org

Please learn more about diesel technology in the Midwest
https://www.dieselforum.org/in-your-state

Clean Diesel Webinar

Larry Hilkene

Cummins

17 March 2021

Agenda

- Fuels of Choice
- Clean Diesel
- Natural Gas
- Electric/Hydrogen/Fuel Cell
- Questions

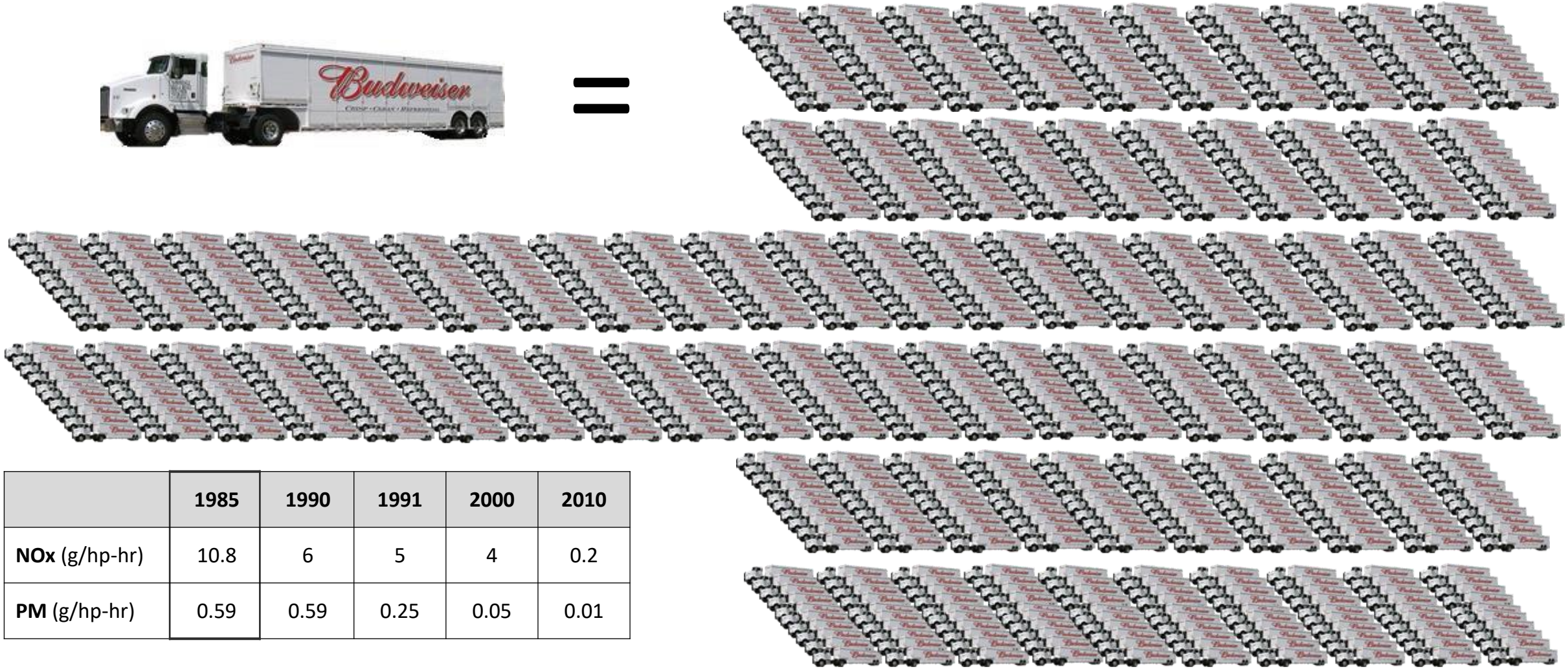
Power of choice

Efficient. Reliable. Innovative. A global integrated powertrain leader in a world that's Always On

- Offering a broad portfolio of power solutions from advanced diesel, near zero natural gas, fully electric, hydrogen and other alternative technologies
- The right technologies at the right time, with innovative integration capabilities for a broad range of applications and powertrains
- An unmatched technical and connectivity expertise supports the unique needs of our customers no matter when, where or how they need us

Heavy Duty Truck/Bus Emissions Reduction Impact - NOx

=



	1985	1990	1991	2000	2010
NOx (g/hp-hr)	10.8	6	5	4	0.2
PM (g/hp-hr)	0.59	0.59	0.25	0.05	0.01

Natural gas 2018 product line

ISX12N

L9N

B6.7N

Certified Near Zero Optional Low NOx 0.02g/bhp-hr

Engines pictured are not to scale.

The Cummins difference

ONE CENTURY OF POWERTRAIN INNOVATION

POWERTRAIN OF CHOICE

CAPABILITIES ACROSS APPLICATIONS

ABILITY TO ACHIEVE SCALE

SECURITY OF SUPPLY

GLOBAL FOOTPRINT FOR SUPPORT


Cummins

PLANET 2050 aspirational targets

COMMUNITIES ARE BETTER BECAUSE WE ARE THERE

2050 Targets

- Net positive impact in every community in which we operate
  = sum of environmental good > local environment footprint
- Near zero local environmental impact

DOING OUR PART TO ADDRESS CLIMATE CHANGE AND AIR EMISSIONS

2050 Targets

- Customer success powered by carbon neutral technologies that address air quality
- Carbon neutrality and near zero pollution in Cummins' facilities and operations

USING NATURAL RESOURCES IN THE MOST SUSTAINABLE WAY

2050 Targets

- Nothing wasted
  - Design out waste in products and processes
  - Use materials again for next life
  - Reuse water and return clean to the community

NOTES *References to "facilities" relate to all consolidated operations and joint ventures subscribing to Cummins' Enterprise Environmental Management System. Goals will be periodically assessed for progress and continued practicability*

Biodiesel of Today

Steve Klein, Senior Manager, Marketing

3.17.21

REG RENEWABLE ENERGY GROUP

Safe Harbor Statement

This presentation contains certain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended, including statements regarding the REG's future growth and value creation. These forward-looking statements are based on current expectations, estimates, assumptions and projections that are subject to change, and actual results may differ materially from the forward-looking statements. Factors that could cause actual results to differ materially include, but are not limited to: potential changes in governmental programs and policies requiring or encouraging the use of biofuels, including RFS2; availability of federal and state governmental tax incentives; unanticipated changes in the biomass-based diesel market; competition in the markets in which we operate; technological advances or new methods of production or the development of energy alternatives to biomass-based diesel; our ability to generate revenue from the sale of fuels on a commercial scale and at a competitive cost, and customer acceptance of the products produced; unanticipated construction constraints; and other risks and uncertainties described in REG's annual report on Form 10-K for the year ended December 31, 2018, Form 10-Q for the quarter ended June 30, 2019 and other reports subsequently filed with the SEC. All forward-looking statements are made as of the date of this presentation and REG does not undertake to update any forward-looking statements based on new developments or changes in our expectations.

This presentation reports Adjusted EBITDA, a non-GAAP financial measure. A reconciliation of Adjusted EBITDA to net income, the most comparable GAAP measure, is provided in the Appendix to this presentation.

Printed 1-11-2017

REG At A Glance

20+

YEARS

of biodiesel industry leadership

505

MMGY

Nameplate capacity

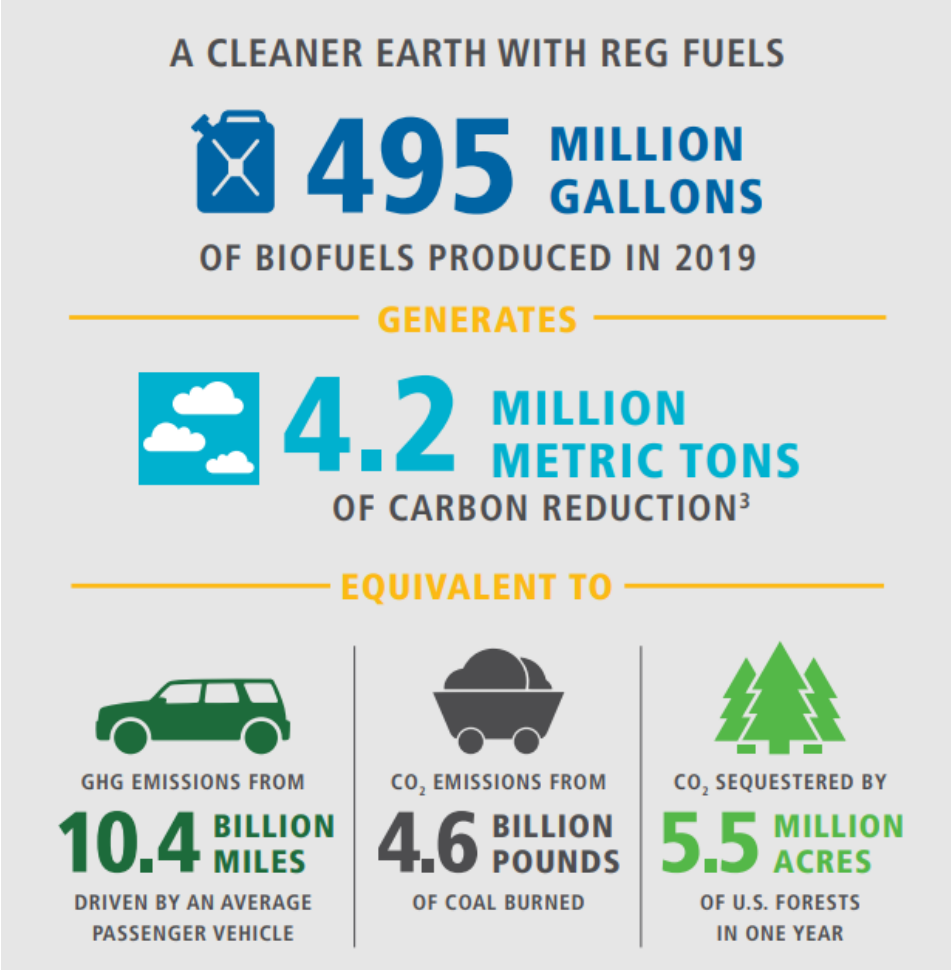
FUEL LINEUP

Biodiesel, renewable diesel, ULSD, blended fuel, more

DEDICATED SERVICE

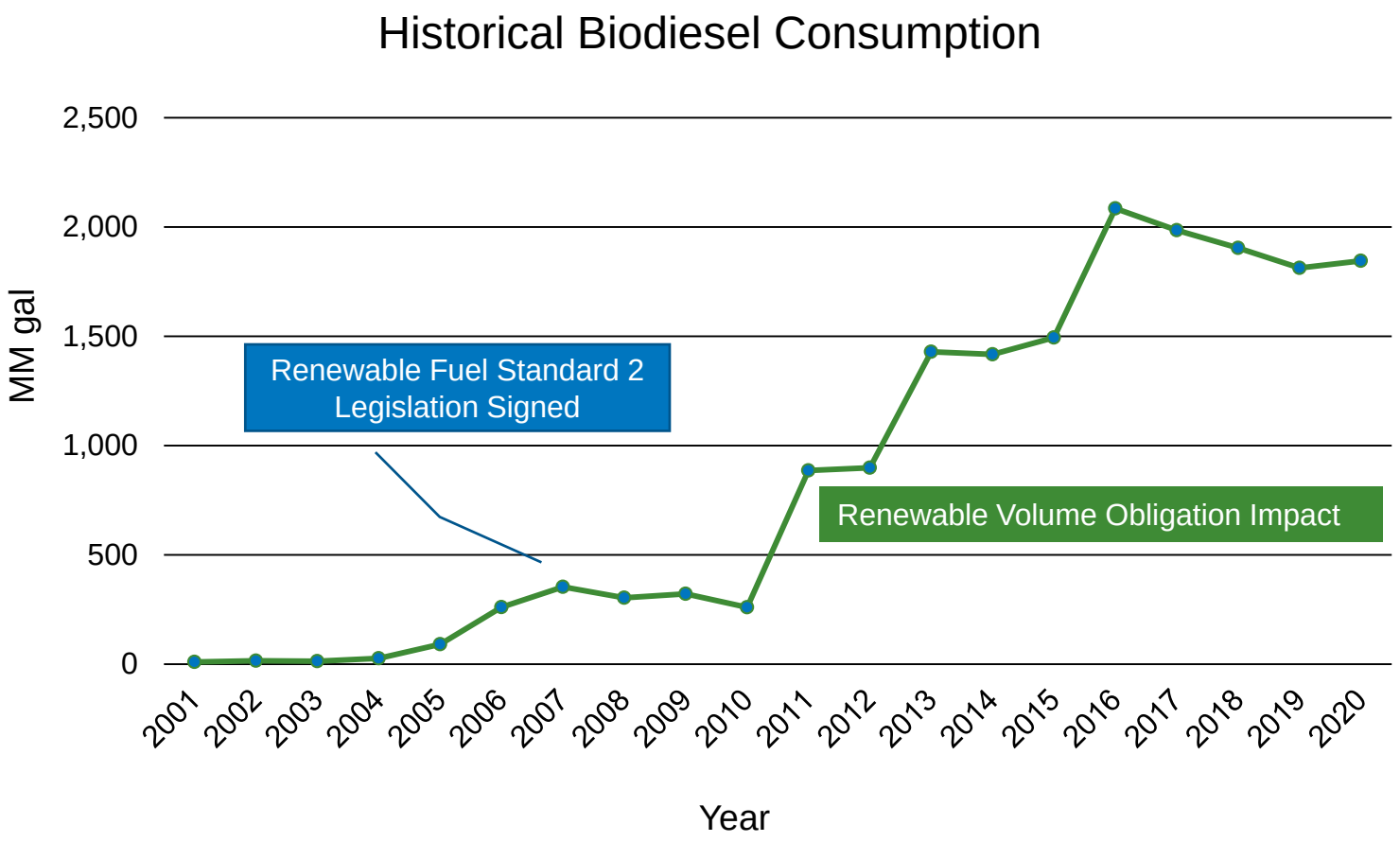
and technical support

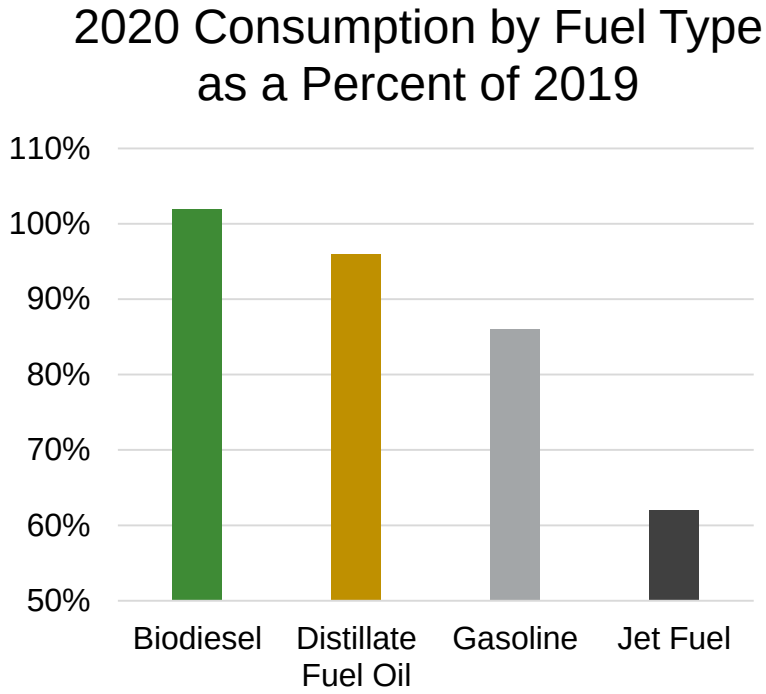
REG Environmental Stewardship



Corporate Knights named REG to its 2020 Clean200 list of publically traded firms generating revenue from products and services that provide solutions for the planet

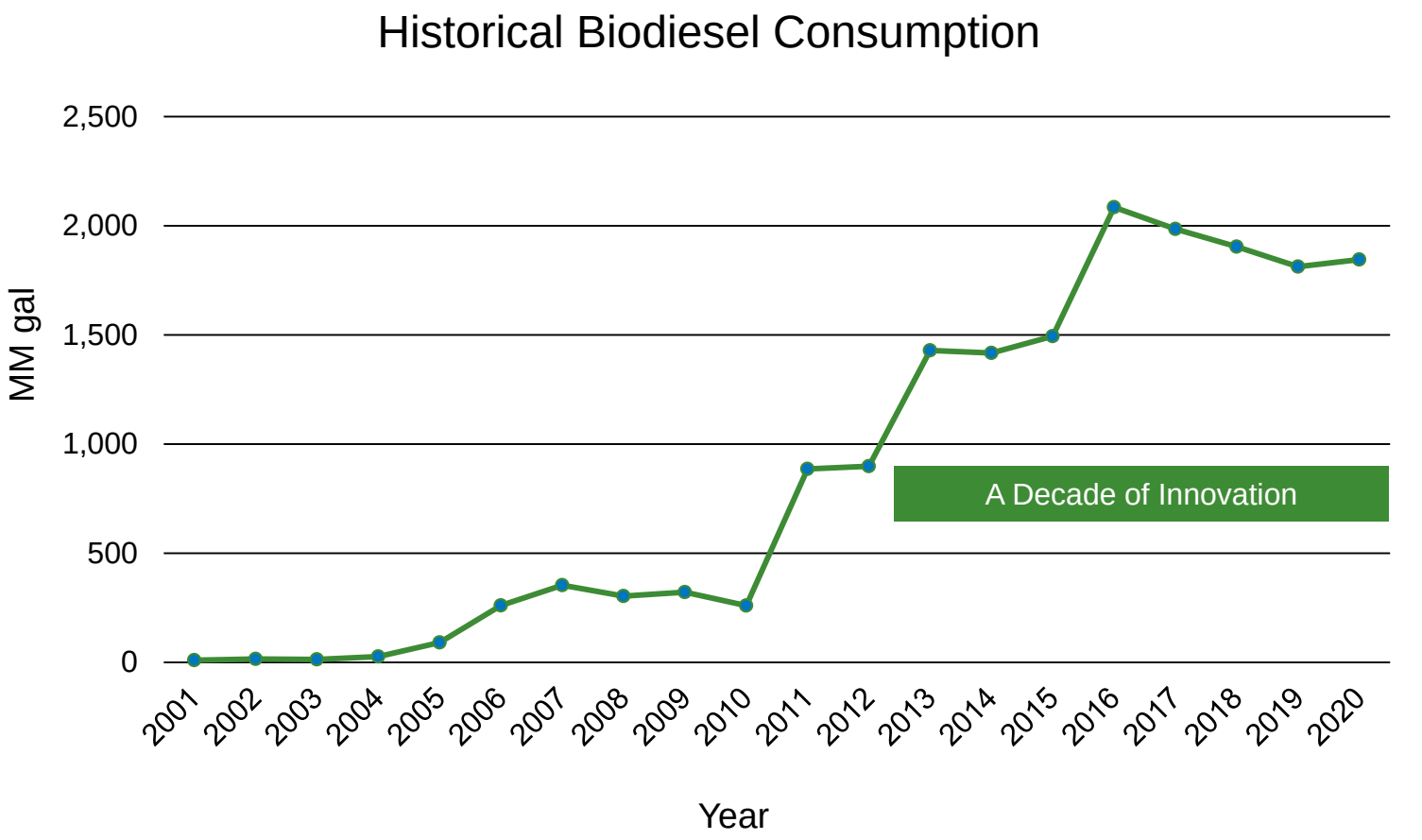
Biodiesel of Today





Source: U.S. EIA/Monthly Energy Review February 2021

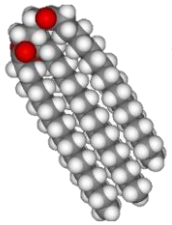
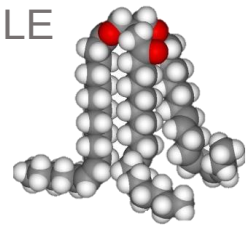
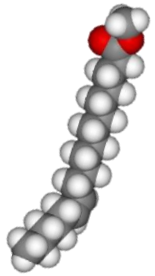
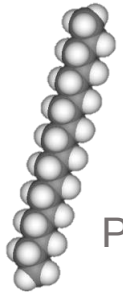
Biodiesel of Today



- Stringent ASTM quality standards
- BQ-9000® accreditation program
- Certificate of Analysis (CoA)
- Biorefinery design modifications
  - Feedstock flexibility
  - Recycling
  - Increased finished fuel per pound of feedstock yield
- Distilled biodiesel
- Carbon footprint reduction

Source: U.S. EIA/Monthly Energy Review February 2021

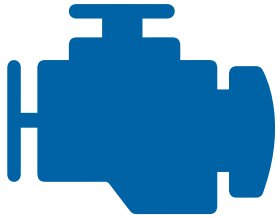
Biodiesel and Renewable Diesel

FEEDSTOCK	PROCESS	PRODUCT	SPECIFICATION
Both can use any fat or oil  ANIMAL FAT VEGETABLE OIL 	**Biodiesel** • React with methanol (transesterification) • Convert 3-carbon backbone to glycerol • Oxygen remains in fuel molecule	 FAME	• **Meet the diesel spec, ASTM D6751** • Different molecules than petroleum diesel • Oxygenated fuel
	Renewable Diesel • React with hydrogen (hydrotreat & isomerize) • Convert 3-carbon backbone to renewable propane • Convert oxygen to H_2O	 PARAFFIN	• **Meet the diesel spec, ASTM D975** • Molecules are familiar constituents of ULSD (petroleum diesel) • Paraffinic fuel

Advantages of Biodiesel

REDUCED EMISSIONS

SAFE HANDLING



INCREASED LUBRICATION

BIODEGRADABLE

GHG Emissions Increase Per Gallon vs REG B100[1]

580%

Petroleum diesel

430%

Compressed natural gas

190%

Electric vehicle with natural gas-derived electricity

[1]REG calculations based on CA-GREET Model. Based on REG produced biodiesel using used cooking oil

Performance Stays Strong With Biodiesel

Drop-in fuel

ASTM CETANE MINIMUM

47 Biodiesel ▸ **40** Diesel

2% = 2x

Biodiesel More Lubricity

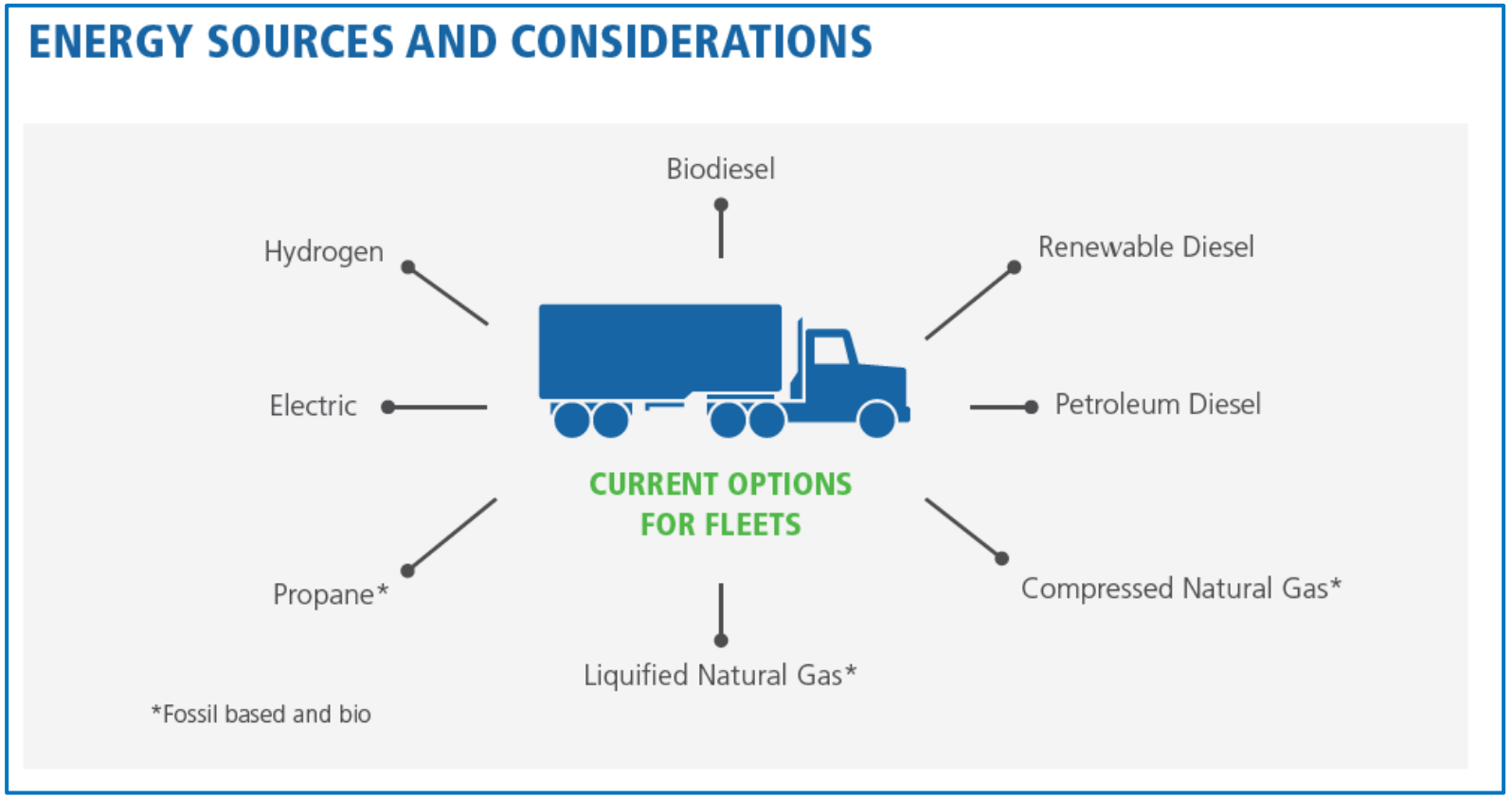
Meets stringent ASTM specs

"When we switched to biodiesel there was zero degradation in fleet performance. It was a huge success."

–Vince Buonassi, G&D Integrated

Integrated Energy Management

- A comprehensive strategy in which fleet managers consider all available fuel sources and adopt all options that best meet their needs.



Benefits

Timeline For Success

- Transition away from fossil fuels now

Sustainability Goals

- Achieve goals now with compounding effect

Energy Diversification

- Fleets are less susceptible to energy source disruption

REG

Carbon Reduction Now

- In less than a decade …
  - Biodiesel has reduced the carbon footprint in the United States transportation sector by 120.9 million metric tons[1]
    - Equivalent to:
      - CO_2 emissions from 133.2 billion pounds of coal burned[2]
      - Carbon sequestered in one year by 157.9 million acres of U.S. forests[2]

Timeline For Success

- Transition away from fossil fuels now

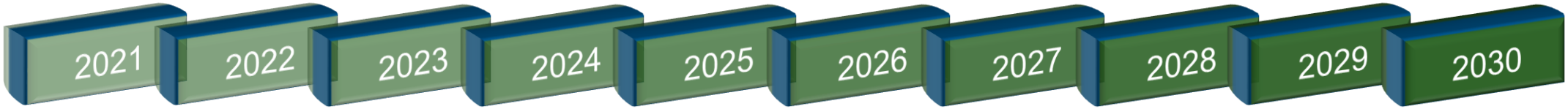
Sustainability Goals

- Achieve goals now with compounding affect

- Reducing emissions now has a cumulative effect, leading to greater reductions over time
  - The CO_2 emissions from burning fossil fuels do not disappear after one year … they accumulate!
  - Based upon a 10 year half life analysis, the cumulative CO_2 emissions reductions over the past decade exceeds 450 million metric tons[3]
    - Equivalent to:
      - CO_2 emissions from 495.8 billion pounds of coal burned[2]
      - Carbon sequestered in one year by 587.7 million acres of U.S. forests[2]

[1]Source: Biodiesel.org/emissions-calculator
[2]Source: epa.gov/energy/greenhouse-gas-equivalencies-calculator
[3]REG internal calculation

Carbon Reduction Now

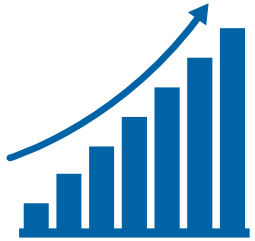


- During the next decade …
  - In 2019, CO_2 gas emissions from fossil fuel combustion in the transportation industry was 1.84 billion metric tons[1]
    - 35% of total CO_2 emissions
      - Medium to heavy duty trucks & buses accounted for 25% of transportation related CO_2 emissions
  - Biodiesel plays a key role in reducing greenhouse gas emissions and improving air quality
    - Technology available now – high quality with coast to coast distribution
    - No engine modifications and infrastructure build
    - Diversifies fuel sources for fleets
  - Reducing emissions now has a cumulative effect, leading to greater reductions over time
    - “A stitch in time saves nine”, 1732

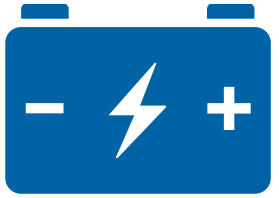
[1]Source: https://www.epa.gov/sites/production/files/2021-02/documents/us-ghg-inventory-2021-main-text.pdf

A Simple Step Today For Cleaner Air Tomorrow

Transportation top contributor to GHG emissions



Emissions accumulate in the atmosphere



Waiting for future technology is doing harm

Bio-based diesel is a simple step to reduce emissions right now

Thank You!

Questions?

Put your questions in the chat or questions box and we'll get to as many as we can!

Contact the Presenters!

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Join Us April 7!

Nonroad Equipment Operations Webinar

April 7, 2021

1 p.m.-2p.m. CDT

Lake Michigan Consortium Webinar Series

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