



February 27, 2018
WI Clean Cities



Jennifer Weaver
National Biodiesel Bd.

The Advantages of Switching to Biodiesel

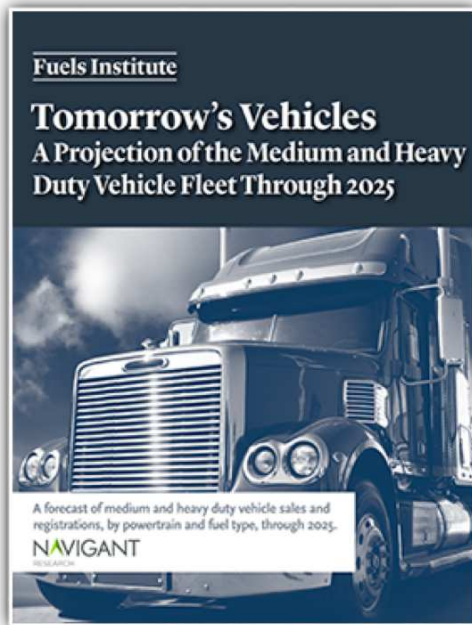
Q: How will diesel most likely be changed in the future?

A:

- The future of the fuels market is heavily influenced by the future of the vehicle market and vice-versa—the two are inseparable.
- As automakers seek to comply with increasingly stringent requirements for vehicle performance and efficiency, the impact on powertrain diversity and fuel preference could be significant.

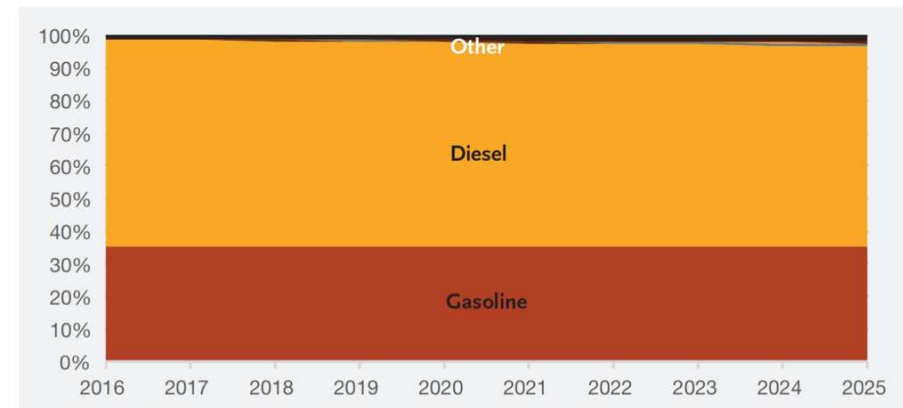


Commercial Vehicles Will Continue to Depend on Diesel Engines



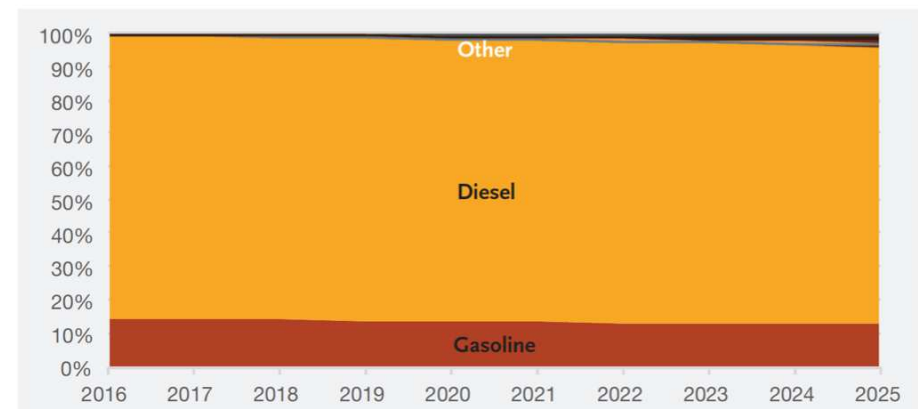
In North America, Diesel and Gasoline powertrains are expected to continue dominating the commercial vehicle segment in forecasts through 2025.

Figure 21a U.S. Market Share of Commercial Vehicle Registrations (Base Scenario)



(Sources: Navigant; Fuels Institute)

Figure 25a Canada Market Share of Commercial Vehicle Registrations (Base Scenario)



(Sources: Navigant; Fuels Institute)

Figure 21c U.S. Market Share of Commercial Vehicle Registrations (Base Scenario)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gasoline	35.10%	35.19%	35.29%	35.36%	35.41%	35.45%	35.46%	35.46%	35.45%	35.42%
Diesel	63.61%	63.34%	63.06%	62.78%	62.50%	62.21%	61.93%	61.64%	61.35%	61.07%
HEV Gasoline	0.06%	0.06%	0.07%	0.08%	0.10%	0.11%	0.13%	0.15%	0.17%	0.19%
HEV Diesel	0.13%	0.15%	0.18%	0.22%	0.27%	0.33%	0.39%	0.46%	0.53%	0.61%
PHEV Gasoline	0.01%	0.01%	0.01%	0.02%	0.03%	0.03%	0.04%	0.06%	0.07%	0.08%
PHEV Diesel	0.01%	0.01%	0.02%	0.03%	0.05%	0.07%	0.09%	0.12%	0.15%	0.18%
BEV	0.02%	0.03%	0.05%	0.07%	0.09%	0.11%	0.14%	0.16%	0.19%	0.23%
FCV	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%
CNG	0.56%	0.64%	0.73%	0.81%	0.90%	0.98%	1.07%	1.15%	1.23%	1.32%
LNG	0.20%	0.21%	0.22%	0.22%	0.23%	0.23%	0.24%	0.24%	0.25%	0.25%
PAGV	0.31%	0.34%	0.37%	0.40%	0.44%	0.47%	0.51%	0.56%	0.60%	0.65%

(Sources: Navigant; Fuels Institute)

Diesel, HEV Diesel and PHEV Diesel Powertrains together are still projected to make up nearly 62% of U.S. commercial vehicle registrations by 2025, compared to 35% gasoline and 3% all others.

Q: What if...

- ...there was a way to operate all of those diesel vehicles in a cleaner, more sustainable way without sacrificing the performance that fleets demand?



A: Good News!

- Biodiesel blends up to B20 can be used in existing and new technology diesel engines without modification, and B20 is supported by 90% of OEMs



Variables that impact consumer / fleet choice of vehicle purchase:

- ✓ Technology Costs
- ✓ Energy Costs
- ✓ Vehicle Compatibility
- ✓ Accessible Infrastructure
- ✓ Geopolitical Concerns
- ✓ Environmental Concerns
- ✓ Maintenance
- ✓ Automaker Support

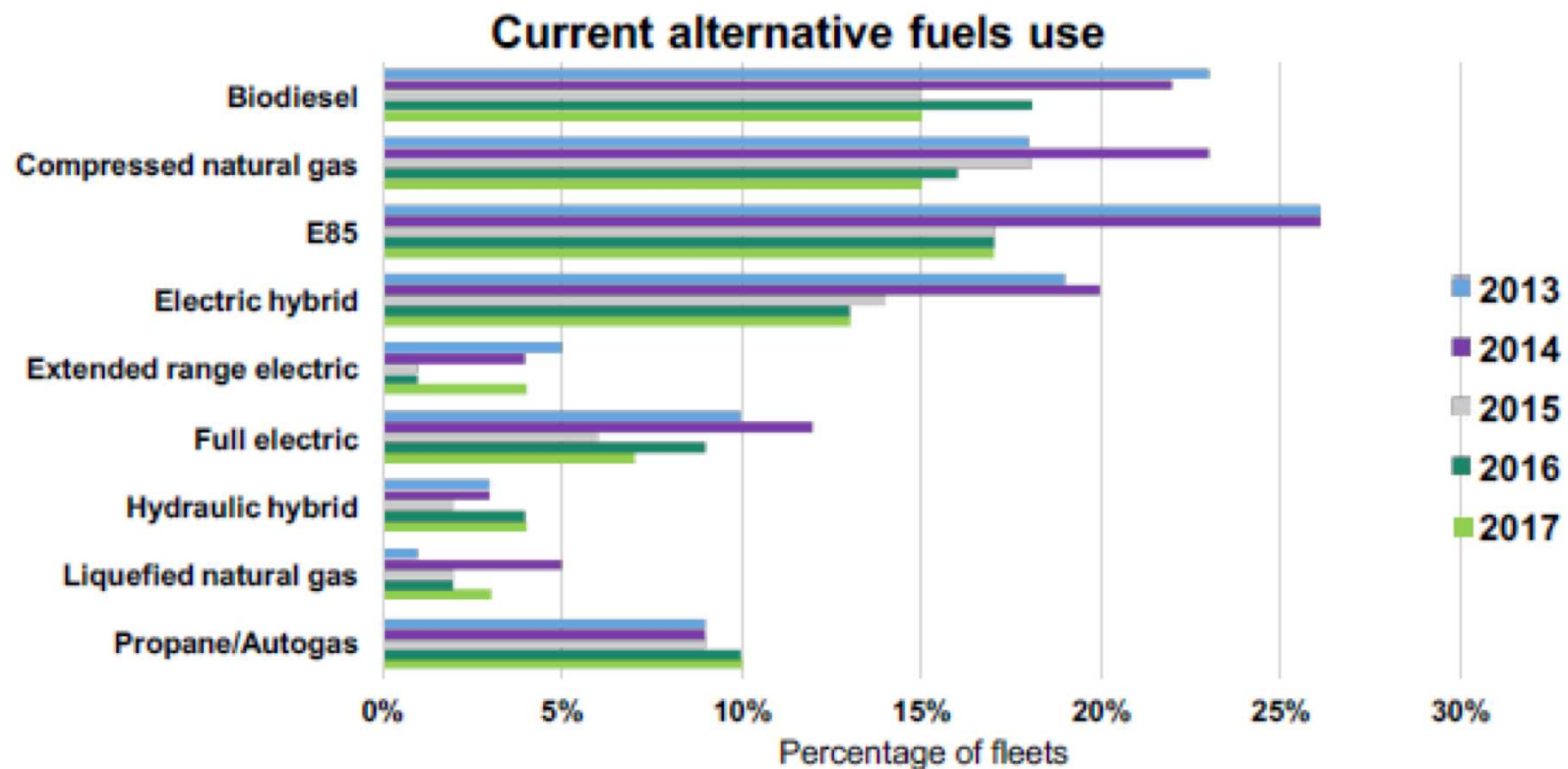
Biodiesel makes the grade on all fronts!



2017 NTEA Fleet Purchasing Outlook



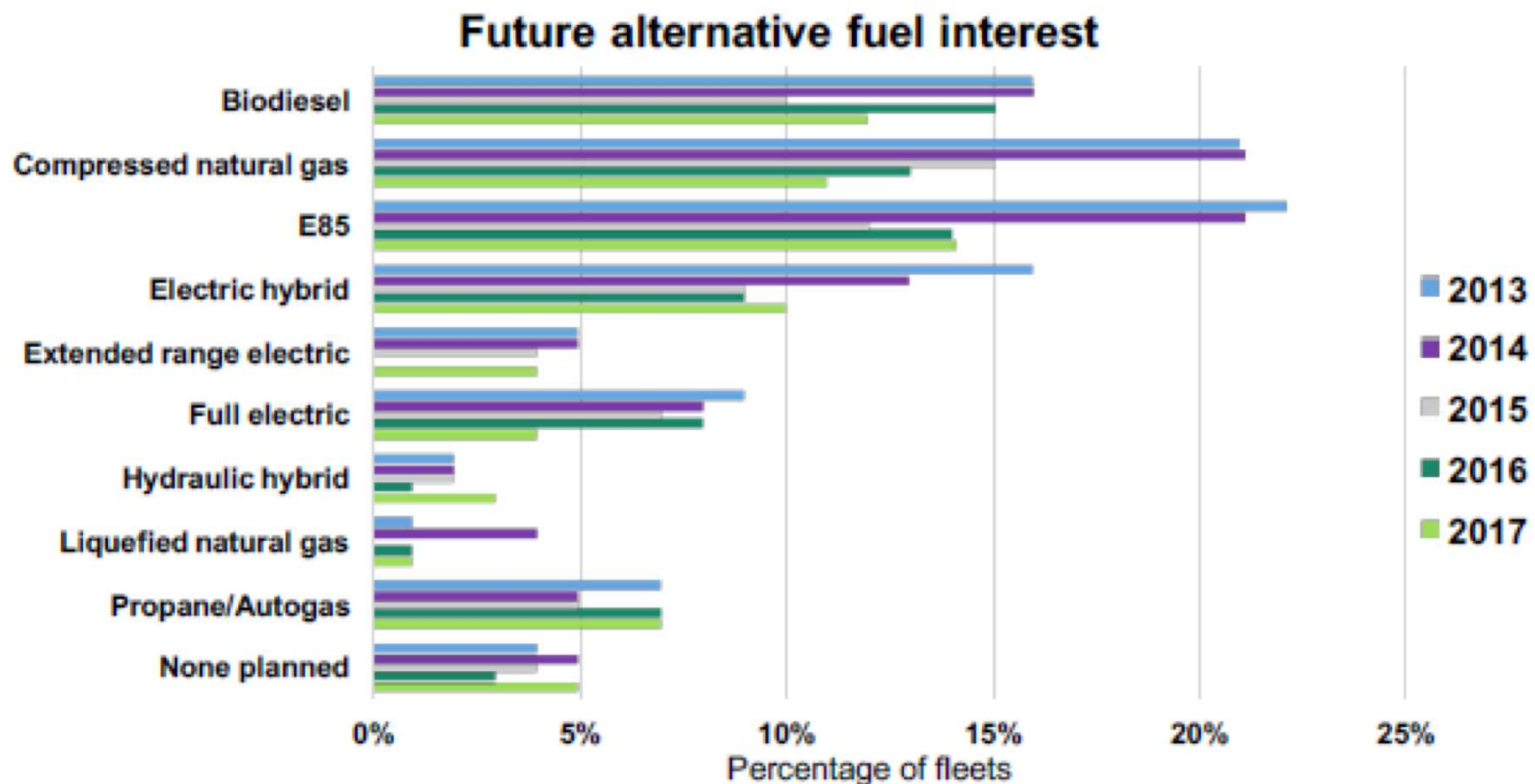
At present, the most widespread alternative fuel preferences are E85, Biodiesel and CNG



Source: NTEA 2013–2017 Fleet Purchasing Outlook Surveys *Figure 32*

2017 NTEA Fleet Purchasing Outlook

Looking ahead, survey participants indicated most interest in E85, Biodiesel and CNG as well



Source: NTEA 2013–2017 Fleet Purchasing Outlook Surveys *Figure 33*

A Sampling of Biodiesel Fleet Users



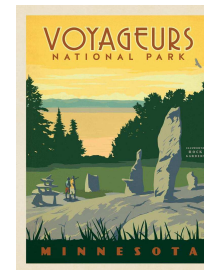
Smithsonian
Institution



LAMBERT-ST. LOUIS
INTERNATIONAL AIRPORT®



COOK-ILLINOIS
CORPORATION



City of
Evanston™



ComEd®

An Exelon Company



FPL®

Top Reasons Why Smart Customers Are Using Biodiesel



Biodiesel Does Good Things:

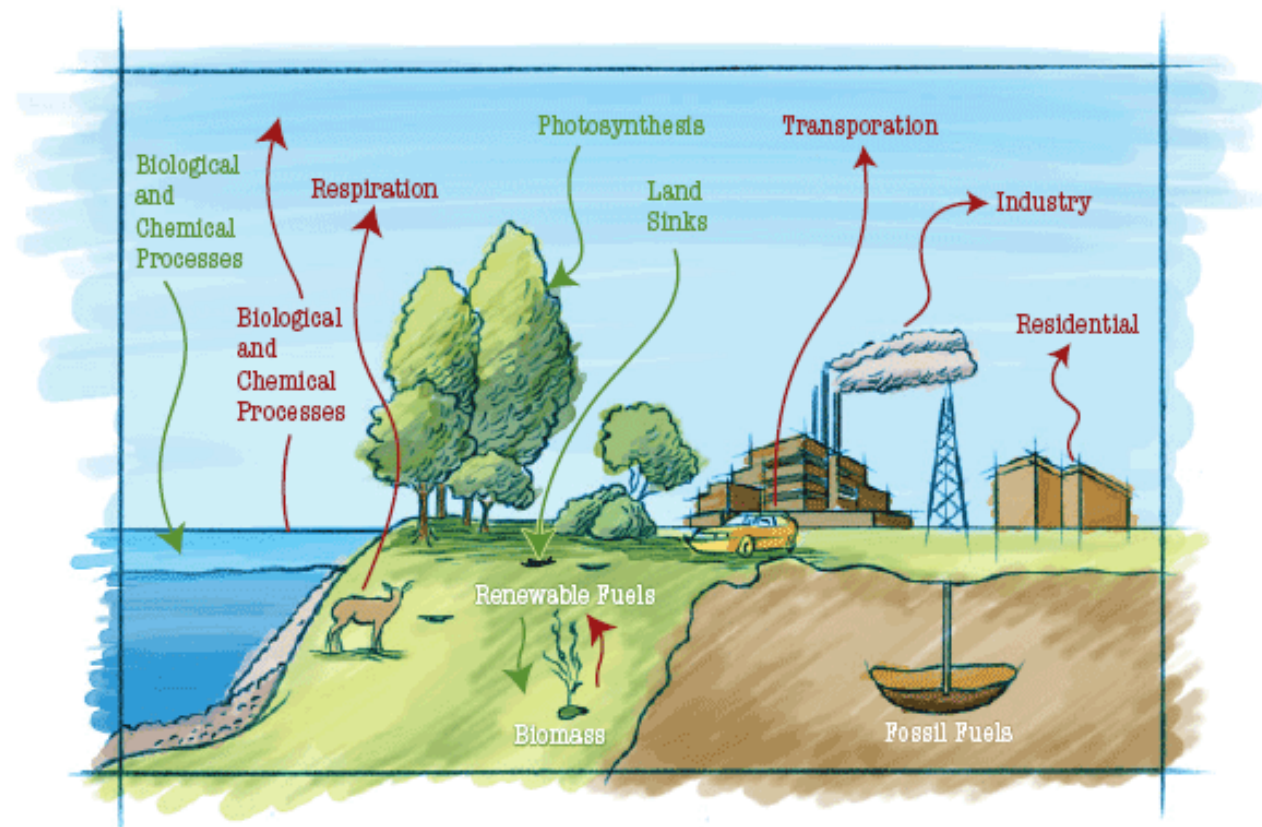
- Provides high quality fuel from domestic, sustainable resources
- Reduces imports and power of oil cartels
- Supports 64,000 U.S. Jobs
- Generates \$11.42 Billion total Economic Impact
- Reduces Particulates, Carbon Monoxide, and Unburned Hydrocarbons, especially from Older Engines & works well in New Technology Diesel Engines as well
- **Reduces Green House Gas Emissions**
- **Best Carbon Footprint of any U.S. Produced Fuel**



Green House Gas Benefits: Biodiesel Reduces Carbon Footprint

- **U.S. biodiesel on average provides an 80% Reduction in Carbon Emissions compared to petroleum diesel**
 - Full life cycle from soil to tailpipe
 - Includes latest indirect land use impacts for biodiesel used in the United States
- **New research* concludes biodiesel reduces GHG emissions by 72% and fossil fuel use by 80% compared to petroleum diesel**

Global Carbon Cycle



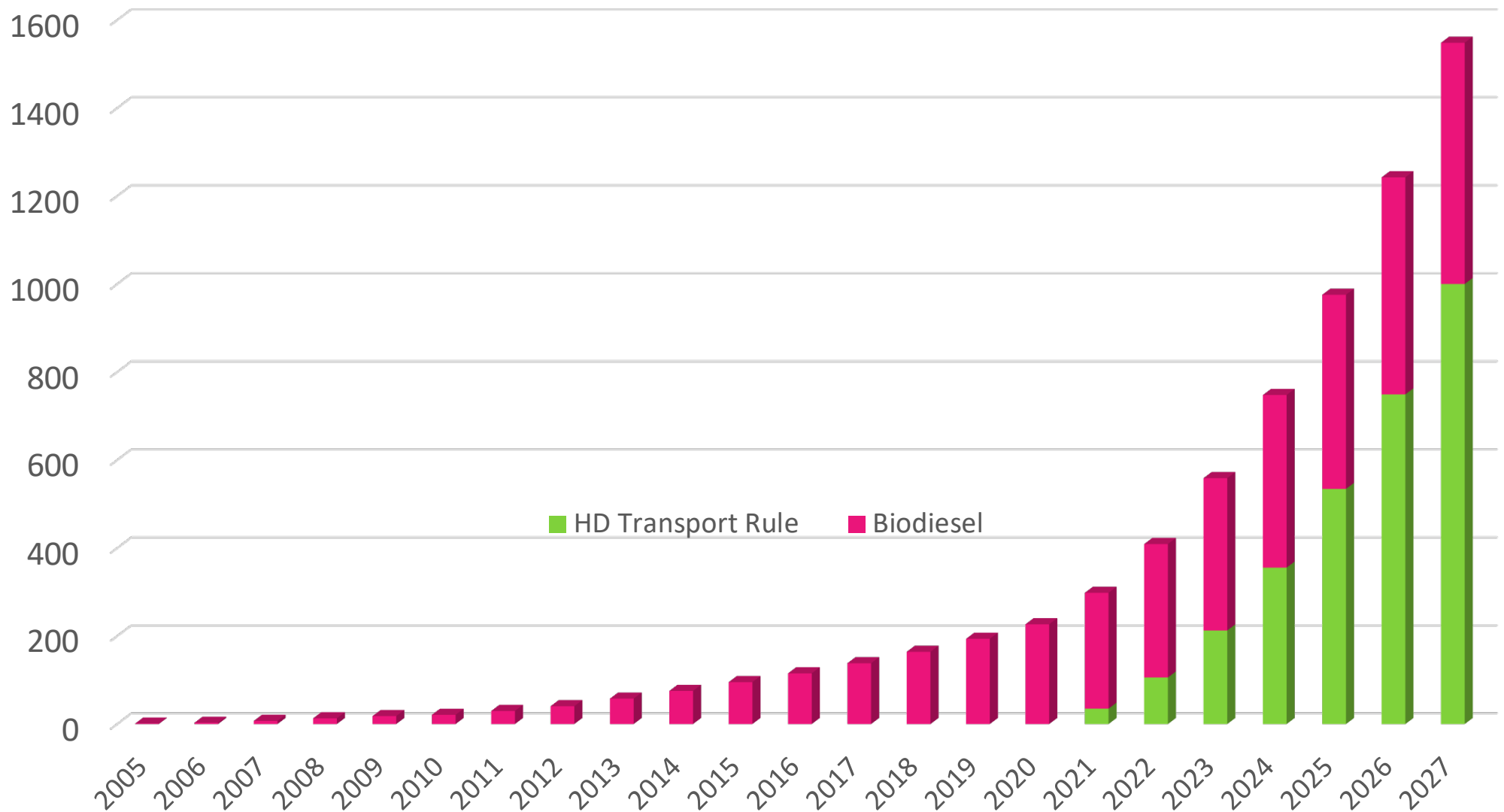
* 2017 research conducted by Argonne National Lab, Purdue University and USDA on Biodiesel Lifecycle Energy and GHG Emission Effects

Transportation GHG Reductions

- New Heavy Duty Truck Standards
- EPA proposes to increase efficiency in Heavy Duty transportation by 24% by 2027.
 - Cumulative GHG savings of 1 Billion tons CO₂



GHG Reduction Potential of EPA's Heavy Duty Truck Rule Plus Biodiesel - Million Tons CO₂e cumulative



Biodiesel is Making a Difference

The 2.9 Billion Gallons of Biodiesel and Renewable Diesel Used in 2016:

- Reduced Carbon Emissions by 24.7 Million Metric Tons



Which is Equivalent to:

- Removing 5.2 Million Cars from America's Roadways
- Planting 641 Million Trees
- Preserving 23.4 Million Acres of Mature Forests



Sustainability

- Biodiesel is produced from a variety of renewable resources, such as plant oils, animal fats, recycled grease, and even algae, making it one of the most sustainable fuels on the planet.
- With biodiesel, **food isn't sacrificed for fuel.** Oils and fats for biodiesel are a minor by-product of producing food for humans and animals.
 - Soybeans are 80% protein, 20% oil
 - No one grows livestock for its fat content
 - No one cooks more fried food to get used oil for biodiesel



OEM Support for Biodiesel



OEM Biodiesel Support

- All major OEMs producing diesel vehicles for the U.S. market support at least B5 biodiesel blends
- In the GVW Class 5-8 vehicles that account for 92% of on-road diesel fuel use, nearly 90 percent of the medium- and heavy-duty truck OEMs support B20
- Nearly every major off-road equipment manufacturer supports B20 or higher blends
- For a complete listing of **OEM position statements on biodiesel**, visit: www.biodiesel.org/using-biodiesel/oem-information
- For a current listing of **Diesel Vehicles Available in the U.S.**, visit <https://www.dieselforum.org/diesel-drivers/clean-diesel-vehicles-available-in-the-u-s>

OEMs Supporting B20



OEMs Supporting B20



*Models equipped with Cummins engines are B20 approved. See NBB website for details.

New in 2016:



PACCAR



KENWORTH

- **Full B20 approval** in new and legacy model PACCAR MX-11 and MX-13 engines for Heavy Duty trucks, as well as in PX-7 and PX-9 Engines for Medium Duty trucks.
- Now the entire diesel fleet of Peterbilt and Kenworth Medium and Heavy Duty trucks are approved for use with B20 Biodiesel Blends



New for 2017-2018:

GENERAL MOTORS FLEET



General Motors has announced it will have **20 different diesel vehicle model options** available in the U.S. market in 2017-2018 – **all of which are approved for use with B20**



- **Chevrolet Express** full-size vans (Cargo, Passenger, Cutaway)
- **Chevrolet Low Cab Forward** commercial truck
- **Chevrolet Colorado** mid-size pickup
- **Chevrolet Silverado** (2500HD, 3500HD, Chassis Cab) full-size pickups
- **Chevrolet Equinox** CUV
- **Chevrolet Cruze** (Sedan, Hatchback)
- **GMC Savana** (Cargo, Passenger, Cutaway) full-size vans
- **GMC Sierra** (2500HD, 3500HD, Chassis Cab) full-size pickups
- **GMC Canyon** mid-size pickup
- **GMC Terrain** CUV
- **Class 4/5 conventional cab truck** being developed jointly with Navistar.

Ford: B20 Approved



Ford approves
B20 in all its 2011
MY and beyond

Class 2 - 5
Super Duty

&

Class 6,7
Medium Duty
Trucks



And in the Ford Transit Van



As well as the new
2018 Ford F-150 3.0L Diesel

Fiat Chrysler: B20 Approved



- Fiat Chrysler supports the use of **B20** in the 6.7L Turbo Diesel **Ram 2500/3500/4500 5500 HD** pickups and in the 3.0L **Ram 1500** light duty diesel pickup
- **Ram ProMaster** with 3.0L EcoDiesel I-4 Engine **Approved for B20**
- **Jeep Grand Cherokee** **Approved for B20**



RAM

Jeep



2018: A Promising Year for Biodiesel (And for OEMs and Fleets)



- **Building on Success:** The Biodiesel industry continued on a strong path in 2017, with over 2.6 Billion gallons of biomass based diesel in U.S. despite a lapsed tax incentive
- Biodiesel Blenders Tax Credit retroactively reinstated for 2017; industry continues to push for credit in 2018+
- RFS Volumes for 2018 are in place
 - 2.1 Billion gallons Biomass Based Diesel
 - 4.24 Billion Advanced Biofuel
- Growing number of diesel vehicle options for 2018
- OEM & Fleet support continues to grow



Biodiesel Resources



➤ www.biodiesel.org

- Biodiesel Training Toolkit
- OEM Support Positions on Biodiesel
- U.S. Diesel Vehicle List
- News Releases & Information Resources
- Technical Library, Spec Sheets & Videos



➤ www.americasadvancedbiofuel.com

- NBB's national advertising campaign "Biodiesel Across America"

➤ www.nbb.org

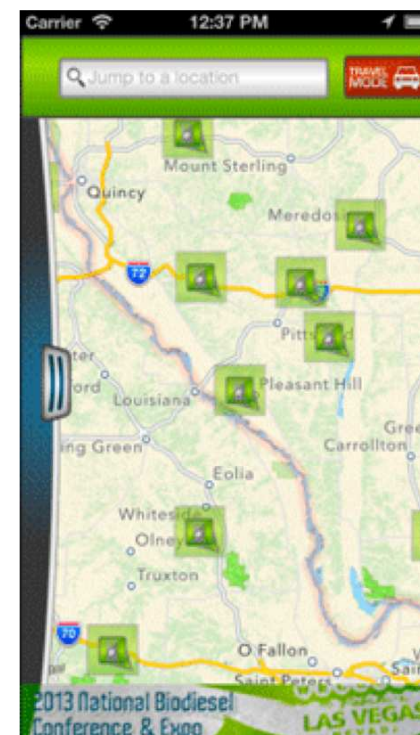
- Official site of National Biodiesel Board

➤ www.BQ-9000.org

- Listing of BQ-9000 Certified Companies

➤ Biodiesel Now Mobile App

- Helps locate biodiesel retailers near you



Thank You!

Questions...?



Jennifer Weaver

OEM Market Development Manager

For the National Biodiesel Board

Ann Arbor, MI

734-904-3822

Jennifer_Weaver@me.com