



Clean Fuels  
ALLIANCE AMERICA

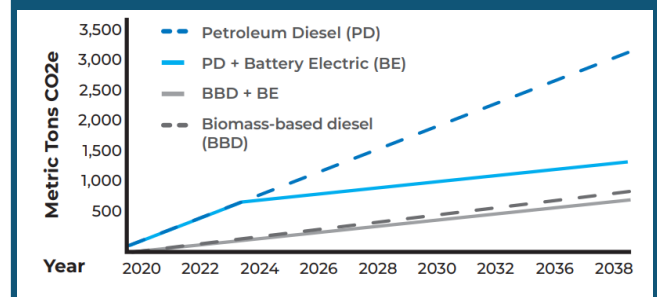
# On the Road with **Biodiesel**



## Why B100?

- B100, or 100% biodiesel, is a clean, low-carbon fuel that can immediately reduce carbon and criteria emissions from heavy-duty engines.
- Many companies are opting for B100 over lower blends because of the reduced emissions. B100 reduces greenhouse gas emissions by more than 70% on average compared to conventional diesel, while B20 provides a 15% reduction.
- Biodiesel offers fleets affordable, low-carbon solutions to immediately improve the sustainability of their operations. This better, cleaner fuel is available now and provides immediate carbon reductions.
- Investing in biodiesel in combination with battery electric technologies achieves the greatest reductions in total greenhouse gas emissions over the next 20 years.
- The environmental benefits of B100 extend beyond the tailpipe. Biodiesel is sourced from renewable resources, such as sustainably grown soybean and canola oil, as well as from cooking byproducts that would otherwise be disposed of, like used cooking oil from restaurants and trimmed animal fat.
  - Carbon neutral production of biodiesel is on the horizon– the most efficient refinery today produces fuel that reduces carbon by 90% compared to petroleum.
  - Biodiesel is a biodegradable, non-hazardous, and non-toxic fuel.
  - Palm oil does not meet the regulatory requirements under the Renewable Fuels Standard to be used as a fuel feedstock in the United States.
- Though biodiesel blends up to B20 can be utilized with no vehicle modifications, companies are able to easily and cost-effectively convert their existing heavy-duty fleet vehicles to B100 with the help of fuel conversion systems, like Optimus Technologies' Vector System.

Cumulative Greenhouse Gas Emissions by Fuel Emissions<sup>1</sup>



Particulate matter

55-80%<sup>2</sup>

Carbon dioxide

74% on average<sup>3</sup>

Aromatic compounds

61-100%<sup>4</sup>

Carbon monoxide

27-48%<sup>5</sup>

**B100  
Reductions**

## B100 & Equipment

- Biodiesel is registered with the U.S. Environmental Protection Agency as a legal fuel and fuel component at any concentration, including B100, meaning it can be used in diesel engines without voiding the warranty.
- B100 does not void an engine's warranty because warranties cover parts and workmanship, not fuels.
- Clean Fuels Alliance America works closely with engine manufacturers to determine their [support for biodiesel blends](#).
- Biodiesel contains zero aromatics, which helps reduce harmful emissions and overall fuel additives. Despite lacking aromatics, biodiesel still causes gaskets to swell in order to seal the engine and prevent fuel leakage, and provides fuel lubricity.
- Biodiesel works well with emissions aftertreatment systems. Using an emissions aftertreatment system can bring criteria pollutants of a vehicle down to near zero.



## Farming Food & Fuel

- U.S. farmers use sustainable farming practices to grow soybeans and canola, which are part of the B100 feedstock mix.
- Farmers are meeting the needs of all markets. They support innovative new crop management processes to increase yields, which will help ensure we have plenty of food and fuel for all industries in the future.
- Biodiesel brings additional value to U.S.-grown soybeans. Though more soybean oil is being used to create biodiesel, this is not impacting the food sector. In fact,



biodiesel was created in part to support farmers whose crop value historically had resided in the protein or “meal” portion of the soybean, while the oil was often discarded.

- Because oil demand is rising to support the soybean market, that means lower costs for soybean meal, leading to a less expensive food product for humans and animals.
- Indirect land use change, or ILUC, does not increase biodiesel's carbon intensity because U.S. soy acres are well-established with no need to convert forests to arable land.

*Materials supported by United Soybean Board, soybean farmers and their checkoff.*



# Sources

1. Jenny Frank, Tristan Brown, Martin Haverly, Dave Slade, Robert Malmsheimer. Quantifying the comparative value of carbon abatement scenarios over different investment timing scenarios. Fuel Communications, Volume 8, 2021, 100017, ISSN 2666-0520, <https://doi.org/10.1016/j.jfueco.2021.100017>.
2. Kwangsam Na, Subhasis Biswas, William Robertson, Keshav Sahay, Robert Okamoto, Alexander Mitchell, Sharon Lemieux. Impact of biodiesel and renewable diesel on emissions of regulated pollutants and greenhouse gases on a 2000 heavy duty diesel truck. Atmospheric Environment, Volume 107, 2015, Pages 307-314, ISSN 1352-2310, <https://doi.org/10.1016/j.atmosenv.2015.02.054>.
3. Neste Corporation. (2020). Neste Renewable Diesel Handbook. [https://www.neste.com/sites/default/files/attachments/neste\\_renewable\\_diesel\\_handbook.pdf](https://www.neste.com/sites/default/files/attachments/neste_renewable_diesel_handbook.pdf).
4. McCormick, R L, Williams, A, Ireland, J, & Hayes, R R. Effects of Biodiesel Blends on Vehicle Emissions: Fiscal Year 2006 Annual Operating Plan Milestone 10.4. United States. <https://doi.org/10.2172/894987>.
5. Durbin, T.D., Miller, J.W., Johnson, K.C., Hajbabaei, M., Kado N.Y., Kobayashi, R., Liu, X., Vogel, C.F.A., Matsumura, F., Wong, P.S., and Cahill, T. (2011) Assessment of the Emissions from the Use of Biodiesel as a Motor Vehicle Fuel in California - Biodiesel Characterization and NOx Mitigation Study, Final report for the California Air Resources Board by the University of California at Riverside, the University of California at Riverside, and Arizona State University, October. [https://ww2.arb.ca.gov/sites/default/files/classic/isd/fuels/diesel/altdiesel/20111013\\_carb%20final%20biodiesel%20report.pdf?ga=2.53364712.1580598593.1689859027-1033342827.1689859026](https://ww2.arb.ca.gov/sites/default/files/classic/isd/fuels/diesel/altdiesel/20111013_carb%20final%20biodiesel%20report.pdf?ga=2.53364712.1580598593.1689859027-1033342827.1689859026).

