

Greenhouse Gases:

Carbon dioxide produced from biodiesel combustion does not contribute to new emissions of CO₂ as it is part of the carbon cycle. Closed carbon cycle- 80% reduction in CO₂. Example: growing oil feedstock consume four to six times more CO₂ than biodiesel exhaust.

Smog-Forming Pollutants (Ozone precursors):

Compared to diesel, biodiesel effects on engine exhaust are in the table that follows: B100 refers to neat biodiesel, B20 refers to 20% biodiesel blended with #2 diesel

HC:	36.73% reduction with B100 (2)	7.35% reduction with B20
CO:	46.23% reduction with B100	9.25% reduction with B20
PM:	68.07% reduction with B-100	13.61% reduction with B20
SO _x (3):	100% reduction with B100	20% reduction with B20

- The above data on HC, CO, PM, and SO_x is based on data reported by Dr. Groboski in 1998 paper "Combustion of Fat and Vegetable Oil Derived Fuels in Diesel Engines." OAE-BIO3 formulation with low-NO_x additive will bring NO_x to diesel baseline. Data on effect of biodiesel on NO_x is scattered. OAE testing of in-use diesel engines showed NO_x reductions of 10-18% compared to diesel baseline. Biodiesel use in in-use diesel engines results in cleaning of injectors which restores the original spray patten (also improves fuel economy), resulting in lowering of NO_x. Testing of heavy-duty laboratory engines by research scientist has not shown the reduction levels achieved with the in-use engines. If low-NO_x is desired, OAE also offers several other proprietary engine technologies to reduce NO_x by 30-40%. Contact OAE representative for low-NO_x options. The above data is with laboratory engines (also called golden engines). In use engines tested by OAE showed NO_x reductions of 18% with the use of biodiesel due primarily to the fact that biodiesel cleaned injectors and lines resulting in better spray pattern.
- Ozone forming potential of biodiesel HC is 50% less for B100, 10% less for B20.
- Calculated by OAE due to no sulfur in biodiesel.

Toxic Emissions:

Polycyclic Aromatic Hydrocarbons (PAH)
reduction w/ B20

80% reduction w/ B100

13%

NPAH (nitrated PAH)
reduction w/ B20

90% reduction w/ B100

50%