

Nonpetroleum Based Fuels

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NREL B20 Study Shows No Increase in NO_x Emissions

November 7, 2006

A recent NREL study concludes that vehicles using B20 fuel—a blend of 20 percent biodiesel and 80 percent petroleum diesel—do not produce an increase in nitrogen oxide (NO_x) emissions, unlike an Environmental Protection Agency 2002 report showing a two percent increase in NO_x emissions for B20.

"This is a major finding because the perceived small increase was leading some state regulatory agencies to consider banning B20 biodiesel," said Robert McCormick, NREL principal engineer for nonpetroleum based fuels research. "Our study helps remove a significant barrier to the expansion of biodiesel markets."

For the study, NREL tested entire vehicles on a heavy-duty chassis dynamometer at its [Renewable Fuels and Lubricants Research Laboratory \(ReFUEL\)](#). The vehicles included three transit buses, two school buses, two Class 8 trucks, and one motor coach. Using the chassis dynamometer, NREL researchers simulated both urban and highway driving for each of these vehicles. In addition, NREL reviewed previously published results for engine and chassis testing of B20.

"Our study shows that the NO_x impact of B20 varies with engine design, such that some engines show a small increase while others show a small decrease. The EPA's 2002 review was based on a data set made up primarily of data from one engine model that produces a small NO_x increase. EPA uses these data to draw a general conclusion for on-highway engines that B20 causes a 2% increase in NO_x," McCormick said. "The chassis dynamometer testing along with careful review of previously published data suggest that their conclusion is not correct, and that on average B20 has no effect on NO_x."

For more information, read NREL's report of this study, *Effects of Biodiesel Blends on Vehicle Emissions* ([PDF 1.9 MB](#)). [Download Adobe Reader](#).

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One of the trucks in NREL's B20 study is tested on the chassis dynamometer at the ReFUEL facility