

Investigating whether biodiesel is truly a viable alternative

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Is biodiesel truly a viable and sustainable alternative to diesel fuels derived from fossil fuels? Writing in the *International Journal of Design Engineering*, a team from India investigates and comes to the conclusion

that the nature of biodiesel as renewable, biodegradable, and non-toxic does indeed make it a good alternative to petrochemical fuels.

Sanjay Patel and P.K. Brahmbhatt, both affiliated with Gujarat Technological University in Ahmedabad, point out that conventional diesel fuel remains one of the primary fuels for transport and many other applications. However, as with all [fossil fuels](#), its use comes at a cost in terms of pollution, particulates, [carbon emissions](#), and, of course, the fact that it is derived from a limited resource, oil.

Biodiesel as an alternative to conventional diesel has come to the fore in recent years as a renewable and perhaps sustainable choice for transport. Many buses and other vehicles worldwide are now powered with biodiesel derived from biomass, either generated from waste or from crops grown for the purpose of biodiesel production. There have been concerns over the years that biodiesel was somehow less efficient than conventional diesel. Moreover, there were also concerns regarding carbon monoxide and nitrogen oxides formation from biodiesel.

The team suggests that with modern biodiesel technology, these concerns are unfounded in terms of emissions of [carbon monoxide](#) and hydrocarbons in the exhaust gases. The higher oxygen content of biodiesel allows for improved combustion despite the lower calorific value of fuels derived from vegetable matter.

However, the presence of oxygen in the fuel itself, while improving combustion raises the cylinder temperature in a diesel engine and so there is a greater concentration of nitrogen oxides produced in the [exhaust gases](#) of a biodiesel-powered engine.

This comprehensive review points to the many benefits and highlights how some of the issues surrounding biodiesel use can be circumvented by the use of blended fuels. These also have the advantage of not

requiring any modification of the engine itself prior to use, something that has been an issue with standard [biodiesel](#) fuels.

More information: Pragensh Brahmhatt et al, Comprehensive Review of Biodiesel as an Alternative Fuel for Diesel Engines, *International Journal of Design Engineering* (2022). [DOI: 10.1504/IJDE.2022.10051142](#)

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