

# Naphthenic Biofuel-Diesel Blend for Optimizing Mixing Controlled Compression Ignition Combustion



## Goals

- Investigate the use of a naphthenic distillate as a multicomponent liquid bioblendstock for use in MD/HD MCCI engines.
- Analyze the bioblendstock composition and perform engine experimental testing to quantify its effects on MCCI combustion.

## Approach

- Provide fundamental understanding of the effects of the naphthenic molecules in the bioblendstock on the finished fuel properties.
- Qualify the naphthenic bioblendstock per ASTM D975.
- Examine the effects of the bioblendstock on the energy density, sooting propensity, cetane number, and cold weather behavior of the finished fuel.
- Collect experimental data of MCCI combustion showing the effects of the bioblendstock on the mixture preparation and combustion processes.
- Perform techno-economic and lifecycle analyses of the proposed production pathway that show at least 50% GHG reduction compared to conventional diesel.

## Potential Impact on Co-Optima Goals

- Demonstrate MCCI combustion with a naphthenic bioblendstock that enables high fuel conversion efficiency and low soot formation.
- Present a viable pathway towards cost-effective production of the bioblendstock.



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