
V. NEW PROJECTS



V.1 Light-Duty Efficient Clean Combustion

Cummins Inc. – Columbus, IN

This project will focus on developing advanced combustion system technology for a light-duty diesel engine application to demonstrate in-cylinder combustion technologies for light-duty diesel engines that realize 10.5 percent efficiency improvements over today's state-of the art diesel engine while meeting U.S. Environmental Protection Agency light-duty emissions standards (Tier 2, Bin 5) in a robust and cost effective manner. The work will integrate the areas of low temperature combustion, air handling, advanced fuel systems, and closed-loop controls to support high efficiency, low emission combustion concepts. The planned approach centers around a multi-step development process including analysis led design, concept integration, advanced system development and demonstration of the combined elements of the combustion system on the Cummins light duty diesel engine platform. The work will target maintaining power density comparable to that of current conventional engines for the applicable vehicle class and will evaluate fuel sensing technology and the potential benefits of combustion system adaptation to fuel type.

V.2 Advanced Boost System Development for Diesel HCCI Application

Ford Motor Company – Dearborn, MI

This project will focus on complete and optimal system solutions to address boost system challenges in diesel combustion/emission control system development, and to enable commercialization of advanced diesel combustion technologies, such as homogeneous charge compression ignition (HCCI) and low-temperature combustion. This work will explore and analytically quantify benefits of various advanced boost technologies in turbine and compressor design for better efficiency, wider operational range and yet be compatible with diesel aftertreatment requirement, provide and validate turbine and compressor maps for diesel system integration and evaluation, demonstrate diesel performance and emission benefits on engine dynamometer, and explore cost and commercial feasibility of the advanced diesel boost system.

