

February 2015 Highlights

ORNL Fuels, Engines, and Emissions Research Center

TECHNICAL HIGHLIGHTS

Fuels, Engines, and Emissions Research Center (FEERC) Research Paper on Lubricant Contributions to Reactivity Controlled Compression Ignition (RCCI) Particulate Matter (PM) makes First Issue of New Journal

A recent study authored by FEERC researchers John Storey, Scott Curran, Adam Dempsey, and Sam Lewis titled "The Contribution of Lubricant to the Formation of Particulate Matter with Reactivity Controlled Compression Ignition in Light-Duty Diesel Engines," pp. 64–79 in the first issue of *Emission Control Science and Technology*, 1(1), 2015. The study was conducted in collaboration with the University of Wisconsin–Madison and Wisconsin Engine Research Consultants under a recent DOE funding opportunity announcement (FOA) award. The study helped fill in a knowledge gap to help understand any potential role of engine lubricant on the formation of PM from RCCI. Previous research has shown that the PM from RCCI operation contains a large amount of organic material that is volatile and semi-volatile. However, it had been previously unclear if the organic compounds are stemming from fuel or lubricant oil. The PM emissions from dual-fuel RCCI were investigated in this study using two engine platforms, with an emphasis on the potential contribution of lubricant. The results of this study give a clear indication that lubricants do not contribute significantly to the formation of RCCI PM.

<http://link.springer.com/article/10.1007%2Fs40825-014-0007-2#>

The Oak Ridge National Laboratory (ORNL) Participates in the Department of Energy (DOE) Clean Cities Five Year Strategy Meeting

ORNL had multiple participants in the recent 2015 DOE Clean Cities Five Year Strategy Planning meeting which took place at DOE headquarters on February 26th. During this meeting, Clean Cities elicited feedback on developing the Clean Cities Program's five year strategic plan. The goals of the meeting were bring together Clean Cities Coordinators, DOE national laboratory researchers and key Clean Cities stakeholders to help shape Clean Cities' next five years of reducing United States (U.S.) dependence on petroleum in the transportation sector. ORNL Center for Transportation Analysis (CTA) researcher Bo Saulsbury presented on light-duty fuel economy and an update regarding Fueleconomy.gov. CTA researcher Janet Hopson also attended the meeting. FEERC researcher Scott Curran also attended the meeting in his role on the board of directors for our local DOE Clean Cities program (East Tennessee Clean Fuels). Former ORNL researcher and current University of Tennessee-Knoxville (UTK) Baker Center fellow, David Greene, also presented at the meeting. DOE Vehicle Technologies Office director Pat Davis kicked off the daylong meeting and DOE Clean Cities co-directors Dennis Smith and Lina Bluestein facilitated the discussions.

FEERC Director Attends National Laboratory Big Ideas Summit Workshop

Robert Wagner attended two workshops at the National Renewable Energy Laboratory (NREL) to review potential Big Ideas to be presented at the FY2015 DOE Big Ideas Summit. Workshop attendees included the national laboratory Chief Research Officers, laboratory leadership team members, and staff involved directly in the big idea presentations. Robert was the ORNL representative for the topic "co-optimization of fuels and engines – accelerating the path to economic and sustainable fuels and vehicles." This topic was selected to be presented at the FY2015 Summit in Washington D.C. in April.

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FEERC Hosts Visit of the U.S. Driving Research and Innovation for Vehicle Efficiency and Energy Sustainability (U.S. DRIVE) Fuels Working Group (FWG)

FEERC hosted the February meeting of the U.S. DRIVE FWG. The FWG consists of members of the automotive manufacturers and the petroleum companies as well as representative of the U.S. DOE. The FWG visited FEERC to see the facilities that are contributing to research in support of near term gasoline changes to enable improved fuel efficiency in the light-duty fleet. The FWG toured the FEERC facilities and received an update on high-octane fuels research at ORNL.

INVITED TALKS AND PRESENTATIONS

FEERC Staff Member Presented a Popular Webinar Presentation on Unmanned Aerial Systems (UASs)

FEERC researcher Mike Kass presented a webinar on UAS engines on February 26th. This webinar presentation was hosted by the Association for Unmanned Vehicle Systems International (the largest professional society devoted to unmanned systems) and sponsored by Northwest UAV (the largest manufacturer of unmanned engines in the U.S.). The webinar presentation focused on UAS engines, design challenges, and paths towards future development. This presentation was well attended with over 120 registered and 75 participants. According to AUVSI, this was one of their most popular webinars to date.

FEERC Researcher Invited to Speak at National Ethanol Conference

Brian West was invited to participate in the “Road to Higher Blends” panel at the 20th Annual National Ethanol Conference, February 18–20, in Grapevine, Texas. Other panelists included Kristi Moriarty from NREL, John Eichberger from the National Association of Convenience Stores, and Robert White from the Renewable Fuels Association. Brian discussed the benefits of high octane blends in modern and future engines, and presented a brief overview of ongoing high-octane fuels research within DOE and Industry. About 1000 stakeholders were in attendance, including ethanol producers, automakers, refiners, regulators, and other interested parties.

Significant FEERC Participation at the Bi-Annual Advanced Engine Combustion (AEC) Program Review Meeting

Three members of FEERC presented their recent results at the DOE’s AEC meeting: Jim Szybist, Derek Splitter, and Adam Dempsey. The bi-annual held at Sandia National Laboratories in Livermore, California, from February 9–12, presents DOE-funded research related to engine combustion to an invited audience. The topics presented by ORNL included in-cylinder reforming, the limits of dilute combustion, and single-fuel RCCI combustion. The presentations were well-received and generated discussion with representatives from academia, industry, and other national laboratories.

AWARDS

OUTREACH