

TECHNICAL HIGHLIGHTS FOR JANUARY 2014

Fuels, Engines, and Emissions Research Center (FEERC) Researchers Publish Two Journal Papers on End Use Benefits of “Renewable Super Premium”

Researchers at FEERC published a two-part study in *Energy & Fuels* aimed at investigating the potential of high octane biofuels, including a blend of 30% ethanol which has been dubbed “renewable super premium.” The study highlighted differences in the load range potential of this fuel compared to regular gasoline in a high compression ratio configuration and showed how it can be an enabler to higher efficiency vehicles through downsizing and downspeeding. In the short time since being published, the two-part study has garnered a significant amount of attention. It was the focus of an article in *Green Car Congress* and was cited in at least two presentations at the Society of Automotive Engineers (SAE) Government/Industry meeting and the Oak Ridge National Laboratory (ORNL) staff have fielded a growing number of queries about how to gain access to these papers.

FEERC Researchers Organize 2014 SAE High Octane Fuels Symposium

FEERC researchers Scott Sluder, Jim Szybist, and Brian West worked with Patrick Merritt of Southwest Research Institute to organize the symposium which brought together stakeholders from automotive companies, petroleum companies, the ethanol industry, fuel retailers, and other interested parties. Presentations and discussions at this year’s symposium centered around the potential fuel efficiency and life cycle CO₂ benefits of high octane fuels and technical challenges that need to be overcome in order to capture these benefits. Patrick Davis, Director of the Department of Energy (DOE) Vehicle Technologies Office, and Jonathan Male, Director of the DOE Biomass Program Office, served as moderators for the event. The symposium was held in January in conjunction with the SAE Government/Industry Meeting and the Washington, D.C. auto show.

FEERC Staff Contribute to the SAE Government/Industry Meeting

FEERC staff members Scott Sluder, Jim Szybist, Dean Edwards, and Robert Wagner participated in the 2014 SAE Government/Industry Meeting. The meeting focuses on exchange of technical and policy related material between industry stakeholders and relevant government agencies in the transportation field. Scott Sluder co-organized and chaired the Light Duty Vehicle Technology session along with Mike Harpster of General Motors (GM) and Chuck Schenk of the Environmental Protection Agency (EPA). Jim Szybist, Dean Edwards, and Robert Wagner developed and presented invited presentations at the meeting. Ron Graves, Director of ORNL’s Sustainable Transportation Program, also delivered an invited presentation.

INVITED TALKS AND PRESENTATIONS

FEERC Researchers gives Invited Talk to the Center for Bio Energy and Sustainability (CBES) at ORNL on Bio-Fuel Benefits and Associated Powertrain Opportunities

Derek Splitter gave an invited talk entitled “Methods of Reducing Transportation Energy and Petroleum Consumption and Environmental Impacts,” at ORNL to CBES. Results from ORNL in recent *Energy & Fuels* and upcoming SAE World Congress manuscripts were presented. The material highlighted why high-octane number bio-fuels offer ideal engine properties beyond those indicated by conventional means (i.e., octane number). The results indicated promise that optimized fuel properties and powertrain configurations may be a leading pathway forward for reducing vehicle petroleum consumption and CO₂ emissions.

ORNL/National Renewable Energy Laboratory (NREL) Collaborative Research Presented at the 2014 National Biodiesel Conference

ORNL researchers Todd Toops and Michael Lance gave invited presentations of their recent research at the 2014 National Biodiesel Conference and Expo in San Diego, California, in the session entitled *New Technology Diesel Engines: Confirming Biodiesel's Benefits and Impacts*. Their combined presentation in conjunction with Aaron Williams of NREL, "Impact of Metal Impurities on Catalyst Durability," highlighted a collaborative effort between ORNL, NREL, and Ford. The project is aimed at understanding compatibility issues associated with increasing the current 5% blend limit of biodiesel to 20% in diesel fuel.

ORNL Researcher Presents on Novel Lubricant Additives to DOE VTO Technical Leaders

Jun Qu gave a presentation entitled "Ionic Liquids as Novel Lubricant Additives to Improve Fuel Efficiency of IC Engines," at the DOE VTO HQ technical seminar on January 23, 2014. This presentation summarizes ORNL's progress on the development of oil-soluble ionic liquids (ILs) as next-generation oil additives for engine lubrication

AWARDS

FEERC Researcher to receive SAE's Forest R. McFarland Award

FEERC researcher Scott Sluder has been named a 2014 recipient of the SAE Forest R. McFarland Award.

The award recognizes outstanding contributions toward the work of the SAE Engineering Meetings Board (EMB) in the planning and development of technical meetings. This occasion marks the second time that Scott has received the award, which is being awarded in recognition of his outstanding leadership during the first year of his chairmanship of the EMB's Land & Sea Operating Group. Scott will receive the award at the 2014 SAE World Congress in April.

FEERC Researcher Invited to Serve on SAE Fellows Committee

Brian West has been invited to serve a 3 year term on the SAE Fellows Committee. SAE International has over 138,000 members in 110 countries involved in advancing self-propelled vehicles in a neutral forum for the benefit of society. Fellow is the highest grade of SAE membership that recognizes and honors long-term SAE members who have made significant impacts in the automotive field through their leadership, research, and innovation. The Fellows Committee consists of twelve members, half of which are generally Fellows. The committee will evaluate Fellow Nominations each summer and make recommendations to the SAE Board of Directors. Brian was elected to the Fellow Grade of Membership in 2012.