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Advanced Biofuels USA
507 North Bentz Street
Frederick, MD 21701
301-644-1395 **For more information: Joanne Ivancic, Executive Director**

Advanced Biofuels USA Publishes Paper and Slide Presentation on Truly Optimized Flex Fuel Vehicles: Benefits and How to Achieve Them

Meeting two parts of its mission, to increase the 1) *understanding* and 2) *use* of advanced biofuels, Advanced Biofuels USA, a nonprofit educational organization, published a paper and accompanying slide presentation. A revised version of Robert E. Kozak's paper on new engine technologies that could produce similar mileage regardless of ethanol/gasoline blend accompanies his slide presentation summarizing why we don't have advanced sustainable ethanols at our "gas stations" yet and describes the more efficient, ethanol/gas optimized engines that will help change that.

Advanced Biofuels USA has long advocated for development of engines that optimize the properties of ethanol and next generation biofuels. Beginning in early 2010 with accolades to Ricardo for their work in this area, the initial version of *New Engine Technologies Could Give New Life (and Larger Markets) to Ethanol* was published. The March 2011 revised version, ***New Engine Technologies Could Produce Similar Mileage for All Ethanol Fuel Mixtures,*** by Robert E. Kozak, focuses on work by Ford (Eco-Boost) and GM (Ecotec), with emphasis on the Buick Regal, Buick LaCrosse and Chevy Cruz. An excerpt explains:

> But what could an eco-boost or ecotec engine do with E-85? Remember the higher octane of E-85? With the 100+ octane rating of E-85, a properly programmed eco-boost/ecotec engine would be expected to produce up to a 10% increase in thermal efficiency. At 41% (an 8% increase) E-85 could produce about 38,618 BTUs (94,190 BTUs x .41) for power. This is about **94%** of that produced from straight gasoline and **97%** of that produced from E-10.

Which means that with these new engines, owners won't have to calculate the difference between mileage with E10 and mileage with E85; they won't have to figure out if the difference in the price between E10 and E85 makes the purchase of the "greener" fuel a "deal." They will know that whatever fuel they buy, they'll travel about the same distance. So, if the E85 is less expensive, those just concerned about price will have an easy decision; and for those who care about energy security, economic development, military flexibility, climate change mitigation, pollution control, sustainability or conservation of scarce resources, the decision is easy, too.

The overall effect will be to increase the demand for E85, convince investors that there is a viable, growing market for next generation ethanols and other advanced, non-food-based biofuels; leading to increased private funding and public support of their commercialization.

Thus, the next time that, intentional or not, limited oil supplies result in long 1970s-type lines at fuel stations, those with E10 vehicles will remain parked along the road while the E85 vehicles will be able to "gas and go" with home-grown power.

The slide presentation, Advanced Biofuels: Meeting Challenges in Fuel Supplies and Energy Efficiency, was prepared for career tech/automotive classes and is appropriate for any individual or group that wants to better understand how engine efficiency and advanced sustainable biofuel development go hand-in-hand.

It begins with a summary of challenges to getting advanced ethanols and drop-in biomass-based fuels into production and to the marketplace. The second part discusses the types of motors being designed and used that optimize the characteristics of ethanol in order to achieve similar optimized mileage, regardless of ethanol/gasoline blends used.

Companion pieces for teachers or discussion leaders are the Biofuels Basics page on the Advanced Biofuels USA web site and *New Engine Technologies Could Produce Similar Mileage for All Ethanol Fuel Mixtures,* by Robert E. Kozak, published at the same time as this presentation.

Advanced Biofuels USA, a nonprofit educational organization, advocates for the adoption of advanced biofuels as an energy security, military flexibility, economic development and climate change mitigation solution. Dedicated to promoting the understanding, development and use of advanced biofuels, the Advanced Biofuels USA web site serves as a library on biofuels and advanced biofuels for everyone from teachers and students to reporters, producers, industry professionals, opinion-leaders, policy advocates and decision-makers.

Contact: Joanne Ivancic, Executive Director, Advanced Biofuels USA; 301-644-1395; info@advancedbiofuelsusa.org