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Contact: Kristin Brekke
kbrekke@ethanol.org / (605) 334-3381

Study Finds Certain Ethanol Blends Can Provide Better Fuel Economy than Gasoline *“Optimal Blend” Is Likely E20 or E30; Coalition Calls for Further Government Research*

Sioux Falls, SD (December 5, 2007) – Research findings released today show that mid-range ethanol blends—fuel mixtures with more ethanol than E10 but less than E85—can in some cases provide better fuel economy than regular unleaded gasoline, even in standard, non-flex-fuel vehicles.

Previous assumptions held that ethanol’s lower energy content should always directly correlate with lower fuel economy for drivers. Those assumptions were found to be wrong. Instead, the new research strongly suggests that there is an “optimal blend level” of ethanol and gasoline—most likely E20 or E30—at which cars will get better mileage than predicted based strictly on the fuel’s per-gallon Btu content.

The new study, cosponsored by the U.S. Department of Energy and the American Coalition for Ethanol (ACE), also found that mid-range ethanol blends reduce harmful tailpipe emissions and that vehicles without any adjustments can operate well on higher ethanol blends than previously thought.

“Initial findings indicate that we as a nation haven’t begun to recognize the value of ethanol,” said Brian Jennings, executive vice president of the American Coalition for Ethanol. “This is a compelling argument for more research on the promise of higher ethanol blends in gasoline. There is strong evidence that the optimal ethanol-gasoline blend for standard, non-flex-fuel vehicles is greater than E10 and instead may be E20 or E30. We encourage the federal government to move swiftly to research the use of higher ethanol blends and make necessary approvals so that American motorists can have the cost-effective ethanol choices they deserve at the pump.”

The University of North Dakota Energy & Environmental Research Center (EERC) and the Minnesota Center for Automotive Research (MnCAR) conducted the research using four 2007 model vehicles: a Toyota Camry, a Ford Fusion and two Chevrolet Impalas, one flex-fuel and one non-flex-fuel. Researchers used the EPA Highway Fuel Economy Test (HWFET) to examine a range of ethanol-gasoline blends from straight Tier 2 gasoline up to 85 percent ethanol. All of the vehicles got better mileage with ethanol blends than the ethanol’s energy content would predict, and three out of four actually traveled farther on a mid-level ethanol blend than on unleaded gasoline.

“I applaud the American Coalition for Ethanol for taking action and studying the impact of intermediate blends of ethanol. I am encouraged by the findings of this study, which should benefit the federal regulatory process for approving higher blends of ethanol,” said U.S. Senator John Thune (R-SD). “Intermediate blends of ethanol will offer consumers more choices at the pump, reduce dependence on foreign oil, and benefit our domestic ethanol industry for years to come.”

In addition to the favorable fuel economy findings, the research provides strong evidence that standard, non-flex-fuel vehicles can operate on ethanol blends beyond 10 percent. The three non-flex-fuel vehicles tested operated on levels as high as E65 before any engine fault codes were displayed. Emissions results for the ethanol blends were also favorable for nitrogen oxides, carbon monoxide and nonmethane organic gases, showing an especially significant reduction in CO₂ emissions for each vehicle’s “optimal” ethanol blend (E20 for the flex-fuel Chevy, E30 for the Toyota and Ford, E40 for the non-flex Chevy).

“These studies show that moderate 20-30 percent ethanol blends can reduce air pollution, improve gas mileage, and save drivers money in the most popular cars on the road today,” said Brett Hulsey, president of Better Environmental Solutions, an environmental health consulting firm. “Moderate ethanol blends are homegrown in America, can be delivered with existing pumps to current vehicles, and cost less than gasoline. Ethanol lowers CO₂ emissions 20 percent from gasoline, making it one of our most effective greenhouse gas reduction programs currently in place.”

KEY FINDINGS

Ethanol's energy content was not found to be a direct predictor of fuel economy. A fuel's energy content in British Thermal Units (Btu) is current standard practice for estimating fuel economy, a method that, because of ethanol's lower Btu value, leads to estimates of decreased fuel economy in proportion to the percentage of ethanol in the fuel blend.

- This research, however, did not find ethanol's Btu content to be a direct predictor of fuel economy. All four vehicles tested exhibited better fuel economy with the ethanol blends than the Btu-value estimates predicted.

E20 and E30 ethanol blends outperformed unleaded gasoline in fuel economy tests for certain autos.

Contrary to Btu-based estimates of fuel economy for ethanol blends, three of the four vehicles tested achieved their highest fuel efficiency not on gasoline, but on an ethanol blend. Mid-level blends of ethanol E20 (20% ethanol, 80% gasoline) and E30 (30% ethanol, 70% gasoline) offered the best fuel economy in these tests.

- E30 offered better fuel economy than gasoline (a 1% increase) in both the Toyota and the Ford.
- E20 offered better fuel economy than gasoline (a 15% increase) in the flex-fuel Chevrolet.
- The non-flex-fuel Chevrolet more closely followed the Btu-calculated trend for fuel economy, but did experience a significant improvement over the trend line with E40 (40% ethanol, 60% gasoline), indicating that this may be the "optimal" ethanol blend level for this vehicle.

Standard, non-flex-fuel vehicles operated well on ethanol blends beyond 10 percent – All automakers currently cover the use of up to E10 (10% ethanol, 90% gasoline) by warranty for standard, non-flex-fuel vehicles. In this preliminary research, the three non-flex-fuel vehicles tested each operated successfully on ethanol blends significantly higher than this 10% ethanol level.

- The Ford Fusion operated on E45, the Toyota on E65, and the non-flex-fuel Chevy on E55. No engine fault codes were displayed until these levels were surpassed.

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The American Coalition for Ethanol (ACE) is the grassroots voice of the U.S. ethanol industry, a national trade association for the ethanol industry with nearly 2,000 members nationwide, including farmers, ethanol producers, commodity organizations, businesses supplying goods and services to the ethanol industry, rural electric cooperatives, and individuals supportive of increased production and use of ethanol. For more information about ethanol or ACE, visit www.ethanol.org or call (605) 334-3381.