

E-85 / E-85-2 / E-85-3 NATIONAL SURVEYS OF E85 / FLEX FUEL QUALITY

CRC Project No. E-85, E-85-2, E-85-3

Scope and Objective

The objectives of the studies were to compare the quality of E85 / Flex Fuel currently sold in the U.S. with the ASTM D5798 quality specification and additionally to investigate other real or potential quality issues for this fuel. NREL/DOE has partnered with CRC for these studies.

Current Status and Future Programs

For the first study, the DOE Alternative Fuels Data Center E85 station database was used by NREL to select E85 public (both retail and fleet) and government fleet pumps for sampling. Locations were selected to cover the broadest possible U.S. continental geographic area. Sampling occurred at three times over the course of a year. The purpose of sampling at different times was to gather seasonally specific samples that would cover all volatility classes. Sampling times were selected to avoid transition classes. All fuel samples were tested for properties shown in D5798 and a short list of other fuel properties. A subset of samples was selected for more detailed characterization. Based on results from the Class 1 samples in the summer of 2008, an addendum of ten Class 1 samples collected in August 2009 was added to this project. The Final Report for Project E-85 was released in 2009.

For Project E-85-2, also in partnership with NREL/DOE, followed a similar approach. Sampling was performed on all three volatility classes throughout the year while avoiding transitional classes, testing all samples for only key properties of interest. Locations were selected to cover the broadest possible U.S. continental geographic area, focusing on urban areas where possible. Class 1 sampling began in July 2010. Class 3 sampling occurred in February 2011, and Class 2 sampling was conducted periodically throughout the project. The Final Report was published by NREL and CRC in January 2012.

Project E-85-3 is being conducted in partnership with NREL/DOE in a similar fashion as prior phases. In recognition of current practice the project now is focused on Flex Fuel, formerly referred to as E85. The objective of this study is to collect fuels from Flex Fuel pumps in the US and determine actual market vapor pressures and ethanol contents and determine compliance with ASTM standard D5798. The ASTM standard has recently been revised to facilitate blending of compliant fuel. A fourth volatility class has been added, and thus the sampling will be extended to include it. Further, ethanol content can now be as low as 51%. *Fuel Quality Tests:* The volatility of the Flex Fuel will be compared to the applicable requirements of D5798-13. The ethanol content of the Flex Fuel will be measured and compared to the appropriate ASTM specification and/or pump labeling. The parameters expected to be measured include: vapor pressure, ethanol content, density, water content, acidity, and inorganic chloride. A draft statement of work is under review by the project panel and the Emissions Committee. The project is expected to begin in the second half of 2013 and continue through late winter 2014.