Ready or Not, Here Comes E15

Brittany Cartner

Introduction

The United States requires that fuel contain a certain volume of ethanol.\(^1\) Each year the number of gallons to be mixed increases, and soon this amount will exceed what the market can sustain.\(^2\) In order to keep from violating the ethanol mandates, the Environmental Protection Agency (EPA) passed two waivers to allow a new product, E15,\(^3\) to be put on the market.\(^4\) Although this may keep producers from violating the mandates, many have criticized the EPA for approving E15 without adequately testing its effects on automobile engines,\(^5\) gas station equipment,\(^6\) and fuel economy.\(^7\) Soon after E15 was approved for use, the automobile, food, and oil industries sued the EPA.\(^8\) In addition to the lawsuit, two bills were proposed in the House of Representatives: Representative F. James Sensenbrenner, Jr., proposed a bill to keep E15 off the

\(^3\) See generally, E15 (A Blend of Gasoline and Ethanol), U.S. EPA http://www.epa.gov/otaq/regs/fuels/additive/e15/ (last updated June 15, 2012) (E15 is the name given to a blend of eighty-five percent regular gasoline and fifteen percent ethanol).
\(^4\) Id.
\(^5\) James R. Healey, E15 Alcohol Fuel Can Wreck Engines, Auto Groups Data Say, USA TODAY (May 17, 2012, 11:00 AM), http://content.usatoday.com/communities/driveon/post/2012/05/e15-alcohol-wreck-engines-tests-dispute-epa-growth-energy/1#.UlPsYYZk0-
market until further testing had been conducted,\(^9\) and Representative John Shimkus proposed a bill to protect gas stations from liability.\(^10\)

**Ethanol Mandates**

In an effort to reduce U.S. dependency on foreign oil and reduce global warming, Congress passed the Energy Policy Act (EPAct) of 2005.\(^11\) This act required that a certain amount of “renewable fuels” be added to the gasoline supply, which would decrease the amount of oil imported.\(^12\) This program was known as the Renewable Fuel Standard (RFS) and Congress required the EPA to put it in action.\(^13\) At the time of EPAct, the RFS was set to 7.5 billion gallons by 2012.\(^14\) Two years later, the Energy Independence and Security Act (EISA) increased the RFS to 9 billion gallons, and the RFS has continued to increase every year, now standing at 36 billion gallons by 2022.\(^15\)

**Current Ethanol Blends on the Market**

Currently all corn ethanol that is mixed into gasoline is in E15, E10, or E85.\(^16\) E10 is the most common blend and is a mixture of ten percent ethanol with ninety percent gasoline.\(^17\) This mixture has been deemed safe for use in all engine types and is found at gas stations nation-

---

11 Id.
12 Id.
13 Renewable Fuel Standard, supra note 1.
14 Id.
15 Id.
17 Id.
wide. Ninety-five percent of the gasoline supply is mixed with ten percent ethanol, using ninety-nine percent of the ethanol produced in this country.

The other one percent of ethanol produced goes into E85. E85 is a mixture of eight-five percent ethanol mixed with fifteen percent gasoline. While this blend consumes more ethanol in production, its use is not nearly as widespread. E85 is harder to find, can only be used in fuel-flex vehicles (FFV), and is not price competitive.

The United States sells fuel-flex vehicles. As of 2012 there were eight million on the road, accounting for about three percent of the American fleet. However, many drivers are unaware that their car is a fuel-flex vehicle and that they can gas their vehicle with E85, thus almost all run on conventional gasoline. On the other hand, even if drivers are aware that they have a fuel-flex vehicle they may not be able to find E85 at a gas station nearby. Although the number of E85 carrying gas stations has increased to 2,270, this is still only 1.2 percent of the nation’s gas stations.

---

18 Id.
19 Id.
21 Id.
22 Id.
23 Id.
24 Id.
Another reason drivers may not be using the E85 is the loss of energy, which is not offset by the price. The average cost of E85 is $3.32, and the average cost of regular gas is 3.67. This indicates a ten percent reduction in cost, which should make ethanol very attractive to drivers. However, these drivers actually end up putting more money in their gas tanks relative to drivers using regular gasoline. The EPA conducted a study on thirty-one different FFV models. The results showed that fuel-flex vehicles’ fuel economy was reduced by twenty-six percent. The loss of fuel economy is due to the difference in ethanol’s energy as compared to gasoline. Ethanol has only 76,000 British Thermal Units (BTU) of energy while the same amount of gasoline has 116,090 BTUs from the same amount of gasoline, almost a two-thirds difference. The EPA estimated that running a vehicle on E85 would cost a driver twenty-three percent more in fuel than running on regular gasoline.

Blend Wall

A problem arises when the amount of ethanol mandated by the Renewable Fuel Standard exceeds the amount of ethanol needed for gas supply. In 2011, the United States used 134 billion gallons of gasoline. Since the gasoline ethanol blend is 90 to 10, only 13.4 billion gallons of ethanol are needed. This is known as the “ethanol blend wall.” The EPA set the

32 Id.
33 Id.
34 Id.
35 Id.
36 Id.
38 Wisner, supra note 2.
mandate of required renewable fuel to 15.2 billion gallons, exceeding what our gasoline supply can handle.\textsuperscript{39}

The EPA, in order to meet the demands of the EISA, passed two waivers which allow E15 to begin its move to the market.\textsuperscript{40} The ethanol manufacturers asked EPA for a partial waiver to use more than ten percent ethanol in gasoline in cars from 2007 and newer, then a second waiver expanding this allowance to 2001 cars and newer.\textsuperscript{41} Before passing the waivers, the EPA depended on engine testing performed by the Department of Energy to determine impacts of mid-level ethanol blends E10, E15, and E20.\textsuperscript{42} The Department of Energy (DOE) did engine tests on eighty-six vehicles to determine impacts of mid-level ethanol blends, E10, E15, and E20.\textsuperscript{43} The test included inspection of critical engine components and ran the engines on a cycle similar to normal driving.\textsuperscript{44} The DOE found no loss of vehicle performance such as emissions, fuel economy, or maintenance issues.\textsuperscript{45} The test should have shown, however, a decline in the fuel economy due to the higher ratio of ethanol.\textsuperscript{46} With the test from the DOE, the EPA granted the waivers.\textsuperscript{47} Although the EPAs waivers will help the ethanol producers not violate the EISA mandates, many critics believe that the EPA approved E15 without sufficient testing and the market is not ready for it. Many believe that E15 will have a negative effect on vehicles,\textsuperscript{48} that

\begin{itemize}
\item \textsuperscript{40} E15, supra note 3.
\item \textsuperscript{41} Id.
\item \textsuperscript{42} Id.
\item \textsuperscript{44} Id.
\item \textsuperscript{45} Id.
\item \textsuperscript{46} With Only 2/3 Energy of Gasoline, Ethanol Costs More per Mile, supra note 31.
\item \textsuperscript{47} E15, supra note 3.
\item \textsuperscript{48} Healey, supra note 5.
\end{itemize}
gas stations do not have suitable equipment,\textsuperscript{49} and that there will be a lack of demand because the price will not be competitive.\textsuperscript{50}

\textit{E15 Damage to Vehicles}

Contrary to the study conducted by the Department of Energy, many believe that the new E15 blend will be dangerous for vehicle engines. Ethanol is corrosive and attracts moisture, which can be detrimental to engine parts.\textsuperscript{51} The Coordinating Research Council (CRC) conducted their own study looking at cylinder compression, valve wear, valve leakage, and emission with eight different engines for a 500 hour durability test.\textsuperscript{52} The CRC showed damaged valves, which can lead to loss of power, diminished vehicle performance, misfires, engine damage, poor fuel economy, and increased emissions.\textsuperscript{53} The CRCs study used engines from model years 2001–2009,\textsuperscript{54} model years that the EPA has approved for E15.\textsuperscript{55}

The Department of Energy criticized the CRC’s test, claiming CRC failed to set a control group because did not test engines with E10 as standard. DOE also said that the cycle CRC used was meant to stress the engine.\textsuperscript{56} The Renewable Fuels Association said that the test was biased when conducted and meant to make E15 fail.\textsuperscript{57}

The use of E15 may void vehicle warranties. Use of E15 may seem to be only a small increase in use of ethanol mixed gasoline, but because most cars are only approved for E10, it is

\textsuperscript{49} A Comprehensive Analysis of Current Research on E15 Dispensing Component Compatibility, \textit{supra} note 6.
\textsuperscript{50} \textit{Controversial E15 Fuel Blend Is on the Way}, \textit{supra} note 7.
\textsuperscript{51} Healey, \textit{supra} note 5.
\textsuperscript{52} \textit{Id.}
\textsuperscript{53} \textit{Id.}
\textsuperscript{54} \textit{Id.}
\textsuperscript{55} \textit{Id.}
\textsuperscript{57} \textit{Id.}
a fifty percent increase in the ethanol used.\(^58\) Chrysler, Ford, Honda, Toyota, Mazda, Nissan, Volkswagen, BMW, Hyundai, and KIA have all stated to Congress that using E15 in the engines that they designed for E10 use will void the warranties on their vehicles.\(^59\)

**Gas Station Equipment Replacement**

Before E15 can go to a gas station, the EPA will need to be sure that equipment is safe to use the higher ethanol blends.\(^60\) The American Petroleum Institute (“API”) conducted a study on equipment already in use in filing stations and determined fifty percent of it would not be safe to use with E15, due to its corrosive properties.\(^61\)

The Department of Energy reached out to Oak Ridge National Laboratory (ORNL) to study the effects of ethanol on metals, elastomers, plastics, and sealants.\(^62\) This study looked at regular gas, E10, E17, and E25.\(^63\) Metals proved to be unaffected by ethanol. Elastomers, however, showed volume swell and softening, both of which lead to leaking.\(^64\) Plastics lost components due to fuel use, and standard sealants failed with E10 and higher.\(^65\)

In 2010, The National Renewable Energy Lab (NREL) and the Underwriters Laboratory (UL) tested the dispensing equipment, which was already approved for E10, with E17.\(^66\) This study looked at STP, Nozzles, Breakaways, Swivels, Hoses, Flow Limiter and Shear valves and


\(^{61}\) Id.


\(^{63}\) Id.

\(^{64}\) Id.

\(^{65}\) Id.

\(^{66}\) Id.
found that seventy percent of the equipment failed. NREL predicted that half of hanging hardware and two-thirds of internal hardware would need to be replaced. Even if stations went to all the trouble to update their equipment, the question remained whether customers would buy it.

E15 Results in Loss of Fuel Economy

Even if gas stations were to update all the equipment, it is questionable whether there will be a demand for E15 because of the decrease in fuel economy with its use. Increasing the ethanol to fifteen percent would result in about a two percent loss of fuel economy. With the fuel being only 1.3 percent cheaper, drivers would be losing money using E15. It is thus questionable whether drivers will want to use the new fuel.

There may be no demand for E15, the engines of automobiles on the road may not be able to handle E15 without damage, and gas stations will need to update much of their equipment to sell E15. The question remains whether the market is ready for this new fuel. Some believe that the market is in fact not yet ready for this fuel and have sought legal avenues to stop the producing of E15.

Legal Action

Once the EPA approved E15 for the market, several groups reacted by taking their complaints through the legal channels. The auto, oil, and food industries sued the EPA, the

---

67 Id.
68 Id.
69 Controversial E15 Fuel Blend Is on the Way, supra note 7.
70 Id.
72 Id.
The auto manufacturers, oil refineries, and food industries all sued the EPA, in Federal court, claiming approval of E15 compromised their industries. The Court of Appeals dismissed the lawsuit for lack of jurisdiction because none of the petitioners had standing to bring action against the EPA. The court said that the auto-trade associates did not establish that E15 would actually damage vehicle engines, and did not provide substantial evidence that consumers would accidently use the wrong fuel in their vehicles. The court stated that the petroleum groups did not show that their liabilities and cost can be traced back to EPA’s waiver decision, because EPA’s decision does not “not force . . . fuel manufacturers . . . to introduce new fuel; it simply permits them to do so.” The court said that the “food group’s interest in low corn prices is much further removed from a provision about cars and fuel.” In all of these cases the court held that it was not the granting of waivers that compromised their industries but the EISA itself, implying that they may in fact challenge the EISA and succeed.

---

77 Id.
78 Id.
79 Id.
In February 2012, the US House Science, Space, and Technology Committee approved a bill that would require the EPA to stop E15 from entering the market until the National Academy of Sciences (NAS) has conducted an 18 month study on its effects including emissions, vehicle durability, diagnostics, materials compatibility, fuel efficiency, and durability of storage tanks and dispensers. This bill remains in committee.

Domestic Fuels Act of 2012 (H.R. 4345)

The Domestic Fuels Act of 2012, seeks to limit the liability of gas station owners. The bill states that the EPA needs to establish rules determining which gas station equipment is suitable for use with fuel additives; then if any gas station has met those requirements they are limited from liability if the equipment is later found to be faulty. The bill also provides that gas station owners are not liable if customers put the fuel mixed with additives into engines that are not made to run on fuel with additives, as long as the pumps are properly labeled. It also states that store owners will not be liable if the use of fuel with additives voids a vehicles warranty. This bill was referred to the Committee of Energy.
Conclusion

There is controversy whether the market is ready for the introduction of E15. Contradicting tests done by the Department of Energy\textsuperscript{89} and the CRC\textsuperscript{90} show different effects on vehicle engines when using an above recommended ethanol content. Auto makers have expressed their concerns by attempting to sue the EPA for granting waivers allowing E15 use in engines.\textsuperscript{91} Half of the equipment used in gas stations will need to be updated to withstand the corrosive elements of the ethanol.\textsuperscript{92} In addition, there is a concern that there will not be enough demand for the supply.\textsuperscript{93}

Although the court threw out the case against the EPA for granting waivers, there seemed to be an implication that those industries should challenge the EISA itself.\textsuperscript{94} Such a challenge could take years and the outcome is unclear. In the meantime, it appears that further testing should be done on engine and equipment compatibility with E15.

---

\textsuperscript{89} Davis, \textit{supra} note 43.
\textsuperscript{90} Healey, \textit{supra} note 5.
\textsuperscript{92} A Comprehensive Analysis of Current Research on E15 Dispensing Component Compatibility, \textit{supra} note 6.
\textsuperscript{93} Controversial E15 Fuel Blend Is on the Way, \textit{supra} note 7.
\textsuperscript{94} Grocery Mfrs. Ass’n. 693 F. 3d at173 (D.C. Cir. 2012).