BACKGROUND: The Energy Policy Act of 2005 (EPAct 2005) established the first renewable fuels standard (RFS), which mandated that refiners blend 7.5 billion gallons of biofuels into the fuel supply by 2012. The Energy Independence and Security Act of 2007 (EISA) extended and expanded the RFS mandate, to require the blending of 36 billion gallons of renewable fuel by 2022. Unfortunately, the RFS is an unworkable standard that has the potential to cause significant harm to the U.S. economy. The following is a brief overview of the most important issue to the refining industry—the blend wall.

BLENDWALL: The point at which the RFS volume of renewable fuels exceeds the volume that can be practically blended into gasoline and diesel fuel is commonly referred to as the blend wall. The primary factor that defines the blend wall limit is the 10% cap on ethanol in gasoline (E10). Nearly 95 percent of vehicles on the road today, as well as lawn equipment, motorcycles, boats, and other small engines, are not designed or warrantied to use fuel that exceeds E10. In fact, it is illegal to use a fuel that exceeds E10 in all small engines and in vehicles built before model year 2001. In addition, the overwhelming majority of the refueling and distribution infrastructure is not compatible with blends exceeding 10 percent.

The RFS is a volumetric mandate, meaning the statutory requirements are the same regardless of how much fuel the U.S. uses. As a result, increasing fuel economy reduces the pool of gasoline that ethanol can be blended with. In fact, the Energy Information Administration estimated has reduced its forecast for 2022 total gasoline demand by 27% (from 172 billion gallons to 127 billion gallons). In 2015 and 2016, gasoline demand in the US is estimated to be 138 billion gallons. At a 10% blending limit, approximately 13.8 billion gallons of ethanol could be used. The implied statutory volume for corn ethanol in 2015 and 2016 is 15 billion gallons each year. As a result, EPA proposed reducing the 2014, 2015, and 2016 mandates from their statutory levels, but nevertheless proposes to exceed the blend wall in 2016.

THE BLEND WALL – AFPM’S CALCULATION OF PROPOSED ETHANOL CONTENT AS A PERCENTAGE OF GASOLINE SUPPLY:

<table>
<thead>
<tr>
<th>TYPE OF ETHANOL</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORN-BASED ETHANOL (CONVENTIONAL)</td>
<td>9.71%</td>
<td>9.68%</td>
<td>10.18%</td>
</tr>
<tr>
<td>CONVENTIONAL + ADVANCED*</td>
<td>9.86%</td>
<td>9.86%</td>
<td>10.53%</td>
</tr>
</tbody>
</table>

* Assumes that the Advanced Biofuel mandate is met using sugarcane-based ethanol in addition to the amounts of cellulosic and BBD mandated. To the extent that a portion of the Advanced Biofuel mandate is met with excess BBD, the actual percentage of ethanol used would fall somewhere between the estimates provided in the two rows.

THE PROBLEM WITH EPA’S PROPOSAL TO BREACH THE BLEND WALL: In order to justify its proposal to break through the blend wall in 2016, EPA makes many assumptions about the fuels market that AFPM does not believe are based in reality.

1. EPA estimates E85 sales could grow from 75 million gallons in 2014 to as high as 600 million in 2016. This is unrealistic for a number of reasons.
Only 6 percent of cars on the road and 2 percent of gas stations are capable of handling E85.

The energy content of E85 is about 25-30 percent lower than gasoline. However, according to AAA, the energy adjusted price of E85 is historically greater than the price of gasoline at the pump. This means it costs more per mile for the consumer to fuel on E85 compared to gasoline.

95 percent of gas stations are independently owned and operated, with more than half unbranded or affiliated with any refiner. Refiners have little to no control over investment decisions or pricing at individual stations.

The upgrading of a retail station to be E85 compatible could cost as much as $200,000 per facility. With 95 percent of existing retail stations owned by marketers and independent retailers, the cost of E85 upgrading could be prohibitive for many small business owners.

Given all of the obstacles related to consumer economics and retail station infrastructure, E85 is not a viable mechanism for addressing the blendwall.

2. EPA estimates E0 (ethanol-free gasoline) consumption will drop from 9.3 billion gallons in 2013 to 130 million gallons in 2016, limiting consumer choice, particularly for boat, motorcycle and other small engine owners.

3. However, EPA correctly assumes that E15 will continue to play a marginal role in the fuel supply.

E15 is only offered at 100 stations (out of more than 150,000 nationwide) and demand will not grow significantly through 2016.

Despite the EPA waivers, E15 is not suitable for use in the large majority of vehicles in the current U.S. fleet. The use of higher ethanol blends may void warranties for vehicles that were not designed specifically for these fuels.

The Coordinating Research Council (CRC) has conducted tests that demonstrate that E15 causes problems with engine durability, fuel system integrity, and on-board diagnostic equipment on a significant number of vehicles tested. The results of these tests imply that millions of vehicles currently on the road could be damaged by use of E15.

The presence of E15 in the retail gasoline market along with E10 creates a risk of misfueling. The EPA proposes to rely on a small pump label to guard against misfueling, but there will be no physical barrier to prevent misfueling. Previous experience during the phase in of unleaded gasoline indicates that consumer misfueling can be a serious problem.

The marketing of E15 presents retail station equipment compatibility problems that are similar to the problems highlighted for E85. Necessary fueling equipment upgrades are expensive for marketers and independent retailers. The lack of regulatory certainty and the potential liability related to E15 use will discourage investment in retail stations.

**ECONOMIC EFFECTS OF THE BLEND WALL.** The ongoing effects of the RFS could cause severe harm for the U.S. economy. A study by NERA Economic Consulting described the concept of the blendwall “death spiral”, where the annual increase in mandated RFS volumes will lead to a reduction in supply of gasoline and diesel fuel to the U.S. market. This reduction in supply (lower production or increased exports) of transportation fuel would occur as obligated parties act to remain in compliance with the requirements of the RFS. In addition, CBO recently found that if the mandates increase to the statutory volumes, the cost of petroleum diesel would increase by **30-51 cents per gallon**, and the cost of E10 (the most prevalent gasoline blend on the market) would increase by **13-26 cents per gallon**.