



GOVERNORS' BIOFUELS COALITION

Comments

***Proposed Rule, 2014 Standards for the Renewable Fuel Standard Program,
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Introduction

The Renewable Fuel Standard (RFS) is one of Congress's most successful energy policy initiatives. The RFS has increased the nation's energy security by creating a market for renewable fuels as a substitute for petroleum-based fuels. It has stimulated extraordinary economic growth, reduced petroleum imports, and lowered greenhouse gas emissions and fuel costs. These are a few of the major accomplishments of the *Energy Independence and Security Act* that are threatened by the U.S. Environmental Protection Agency's (EPA) proposed rule to lower the 2014 RFS target volumes.

On behalf of the Governors' Biofuels Coalition, we urge the Obama Administration to restore the goals for 2014 and to adopt several initiatives that would expand the market for the nation's biofuels.¹

Part I. EPA Should Restore Fuel Targets for 2014

EPA's proposed rule reduces renewable fuel targets much more than is needed to avoid economic disruption in the market for motor fuel. Some adjustments in RFS volumes were needed in 2014 because of the growing divergence in RFS targets for cellulosic biofuels and actual production capacities. However, EPA's proposal to reduce the overall renewable fuel volume to 15.21 billion gallons does not account for how much ethanol can be consumed by existing flex vehicles and dispensed by E85 fueling stations. Furthermore, EPA's justifications for the new target levels ignore the crucial role these levels play in creating economic incentives for infrastructure that will dramatically expand the ability of consumers to choose the type of fuel they use in their cars. As requested in the proposed rule, we are presenting data to support our request that conventional RFS ethanol targets should be maintained at 14.4 billion gallons in 2014 and 15 billion gallons in 2015.

A. Feasibility Of a 14.4 Billion Gallon Conventional Ethanol Mandate In 2014

Five months ago, Bruce Babcock and Sebastien Pouliot from Iowa State University developed a new model of E85 demand. They used data on the location of flex fuel vehicles and E85 fueling stations to calculate the cost to drivers from having to drive further to find an E85 station. This cost was then added to the fuel cost. The owners of flex vehicles were

¹ "Mr. President, I am privileged to be part of this [RFS] effort because I do not believe there is anything more

...

"[The RFS] has dramatic implications for the future of the economy, for our national security, and our independence. It also helps America address the additional and important environmental challenges that lie ahead. This [RFS] is an amendment about America's future."

Senator Chuck Hagel, Floor Debate on S.14, *Energy Policy Act of 2003*, May 8, 2003, *Capitol Words*, http://capitolwords.org/date/2003/05/08/S5888-5_energy-policy-act-of-2003/

assumed to choose between E10 and E85 on the basis of relative fuel costs and preference. The demand model shows that the existing vehicles and existing stations could consume as much as 1.3 billion gallons of E85 in 2014. This represents almost a billion gallons of ethanol, assuming that E85 contains 75 percent ethanol. The US Energy Information Agency projects that total motor fuel consumption would be about 133 billion gallons in 2014. This implies E10 consumption of about 13 billion gallons. Thus, it is feasible for US consumers to use 13.9 billion gallons in 2014. Paulson (2013) estimates that about 900 million carryover D6 RINs will be available to meet 2014 mandates.² The use of a portion of these banked RINs combined with feasible US ethanol consumption shows that E10 “blend wall” concerns are given too much weight in EPA’s propose rule. Restoring the 14.4 billion gallon RFS target for conventional ethanol is not only feasible, it is crucial if consumption of ethanol is going to ever exceed levels that can be supported by E10.

B. Expanding RFS Targets Are Needed to Incentivize Investments

Babcock and Pouliot (2014) estimate that a D6 RIN price of 69 cents would incentivize 800 million gallons of ethanol consumption in E85 with no additional investments in infrastructure.³ They also estimate that installing 500 new flex fuel stations in locations with underserved flex vehicles would reduce RIN prices in 2014 by 51 cents to 18 cents per gallon with 800 million gallons of consumption. A reduction of 51 cents per gallon in RIN prices represents a \$7.3 billion drop in the total cost of conventional ethanol RINs. Assuming that it costs \$130,000 per new E85 station, this large drop in the cost of RINs could be accomplished with a one-time \$65 million investment.

According to a Reuter’s report by Michael Hirtzer, Steve Wall of Protec Fuel was on the verge of selling enough new E85 pumps to two oil refineries to increase the number of stations that sell E85 by 450.⁴ The sale was canceled after the EPA’s proposal to reduce biofuel targets became public. This example illustrates the sensitivity of investment to EPA decisions. With its proposed rule, EPA has signaled that there will be no return on investment from installing pumps that can deliver higher ethanol blends; hence, no investment will occur. EPA has signaled to automakers that there is no reason to produce any more flex vehicles, because there will be no reason to sell E15, E30, or E85. Therefore, it is likely that car manufacturers will quit making flex vehicles if the proposed rule is finalized.

EPA’s proposed rule, which does not push ethanol targets beyond blend wall levels, ignores historical precedent. In 2007, the U.S. gasoline supply included about 6 billion gallons of ethanol, accounting for about four percent of gasoline consumption. In 2007, it was not physically possible to blend ethanol with gasoline in many parts of the country,

² <http://farmdocdaily.illinois.edu/2013/12/rin-update-2014-carry-in-epa-rulemaking.html>

³ Babcock, B.A., and S. Pouliot (2014). “Feasibility and Cost of Increasing US Ethanol Consumption Beyond E10.” 14-PB 17. Center for Agricultural and Rural Development, Iowa State University. January, 2014.

⁴ <http://www.reuters.com/article/2013/11/27/us-usa-ethanol-e85-analysis-idUSBRE9AQ1AU20131127>

including the South, the Southeast, and much of the Northeast and Northwest. It was clear, however, that EPA was going to enforce RFS targets that were going to require investments in infrastructure that would allow E10 blending throughout the country. Between 2008 and 2010, large-scale investments in transportation and blending infrastructure were made with few complaints from the petroleum industry. This silence was due in part to the blenders tax credit, which allowed taxpayer dollars to help finance the investment, and in part because the octane in ethanol combined with its fuel-extending properties made money for the oil industry. Without these initial investments, the E10 blend wall would never have been reached. This precedent is contrary to EPA's current logic that ethanol blending targets cannot be increased until the infrastructure is in place.

In order for RFS targets to ever be met, consumers need to be able to find and use ethanol; therefore, investments in fueling infrastructure and vehicles are essential. Automobile manufacturers have contributed by putting more than 15 million flex vehicles on the road. The nation's governors have supported the effort, too. The Governors' Biofuels Coalition recently announced a flex fuel vehicle program called *Fueling Our Future* — a regional, public-private partnership that utilizes current federal funding in a new way to expand the market for mid-level ethanol blends.⁵

This is the first time RFS targets were proposed at levels that could be met with only a modest proportion of existing flex vehicles filling up on high-ethanol blends. Under EPA's proposed rule, there is no incentive for most vehicles to use anything other than E10, which will discourage any further investment in infrastructure leading us back to the initial problem and solution. The RFS was created to push our nation to invest in a cleaner, more sustainable energy source. The 2014 proposed rule is a step backwards.

One of the most concerning aspects of the proposed 2014 RVO is its immediate impact on cellulosic ethanol research and development. In Illinois, the National Corn-to-Ethanol Research Center has successfully converted agriculture residue into cellulosic ethanol at the 150L scale. This clearly demonstrates that these technologies have been tested and proven to work at a scale closer to pilot/commercial levels and are readily available in the commercial marketplace.

Any of the existing 211 ethanol plants in the U.S. could be retrofitted with equipment and processes that can be constructed and implemented without major modifications to produce cellulosic ethanol from a non-food feedstock which already exists in the plants. There is not an urgent need to build new facilities. Cellulosic ethanol can add tens of billions of gallons of homegrown fuel, with agriculture residue feedstocks alone producing up to two billion gallons of our nation's energy supply.

While first and second-generation ethanol is intrinsically linked, the industry's continued growth depends on the availability of a market for cellulosic ethanol. The

⁵ Letter from Iowa Governor Terry Branstad to the coalition governors, December 31, 2013, http://www.governorsbiofuelscoalition.org/wp-content/uploads/2014/01/13GBC_FFProgram_Letter_Merged_1a.pdf

Administration's proposed rule will put in opposition first- and second-generation ethanol producers with each other in a fight for market share, creating investment uncertainty that will limit future research and development. The Renewable Fuel Standard has been the single most important driver of research breakthroughs for cellulosic ethanol and other advanced biofuels. If finalized, the proposed RVO will reverse the success of this industry, rather than moving it forward.

The proposed RFS will also undermine the growing biodiesel industry, which is the first and only EPA-designated Advanced Biofuel to reach 1 billion gallons of annual production. Despite meeting or exceeding the RFS Biomass-based diesel volume requirements every year, the proposed biomass-based diesel RVO of 1.28 million gallons is less than the amount produced in 2013. This level is unnecessarily low and will stifle the growth and job creation potential of the industry, which is on track to produce nearly 2 million gallons of biodiesel in 2014.

The quickest and surest way to expand the biofuels industry is to maintain current RFS blending targets for conventional biofuels. Babcock and Pouliot (2014) estimate that the 15 billion consumption target is feasible for 2015 through different combinations of RIN prices, investment in new E85 stations and use of carryover RINS. Two billion gallons of ethanol could be consumed in E85 blends by installing 3,000 new E85 stations. These stations can be installed by 2016 but only if the EPA revises the proposed rule to reflect the initial goals of the RFS.

Part II. Other Initiatives to Expand the Nation's Biofuels Industry

As requested in the proposed rule, we are suggesting several short-term, near-term, and long-term actions the Administration can take to expand the nation's biofuels market. These actions, many of which are long overdue, will meet Congress's goal to expand the nation's biofuels industry.

A. Near-term Actions

Extend the RVP Waiver To Higher Ethanol Blends

The EPA should extend the one-pound waiver to all E10 and higher blends. When additional ethanol is splash blended to E10, air quality improves and gasoline octane levels increase.

When the EPA granted *Clean Air Act* fuel waivers allowing gasoline containing 10 to 15 percent by volume of ethanol (E15) for use in model year 2001 and newer light-duty motor vehicles, the agency included the following condition:

"The final fuel must have a Reid Vapor Pressure not in excess of 9.0 psi [pounds per square inch] during the time period from May 1 to September 15."

This requirement presents the single largest national barrier to the introduction of E15 and higher ethanol blends and produces no emissions increase.

The problem is that E15, although it has nearly identical physical characteristics to those of E10, does not qualify for the decades-old exemption. As gasoline evaporates, volatile organic compounds enter the atmosphere and contribute to ozone formation, a problem that is exacerbated by warmer air temperatures. To address this reaction, EPA adopted regulations under section 211(h) of the act, prohibiting the sale of gasoline with a Reid vapor pressure that exceeds 9.0 psi in “volatility attainment areas” and 7.8 psi in “volatility non-attainment areas.” These standards apply from May through September for all refiners, importers, distributors, resellers and carriers.

The act includes an important exception to these RVP limitations, providing that fuel containing “gasoline and 10 percent denatured anhydrous ethanol” can exceed the applicable RVP limitation by 1.0 psi. Congress passed the One-Pound Waiver in 1990 to accommodate the petroleum refiners’ practice of splash blending 10 percent ethanol with conventional gasoline. When 10 percent ethanol is added to conventional 9.0-psi gasoline, the RVP of the mixture will rise to about 10 psi. Absent the One-Pound Waiver, E10 would have required a base gasoline with a lower RVP — about 8.0 psi — to stay below the 9.0-psi statutory maximum. Producing a special low-RVP blend stock presented prohibitive expenses and logistical problems.

EPA’s regulation implementing the One-Pound Waiver is more specific than the *Clean Air Act* drafters intended. It provides that the waiver applies only to blends containing “at least 9 percent and no more than 10 percent” ethanol — language that clearly excludes E15. It is wrong to treat E10 and higher ethanol blends differently because the primary policy reason for adopting the One Pound Waiver for E10 applies equally to E15 and higher ethanol blends. Moreover, E15’s RVP is *essentially identical to that of E10* and presents no greater ozone concerns.

EPA’s One Pound Waiver, as currently written, does not apply to E15, which presents a major barrier to the ethanol industry since it cannot blend E15 with conventional 9.0 psi gasoline in the summertime months — as it has done for decades with E10 — because the resulting fuel’s RVP will be too high. This barrier prevents large-scale introduction of E15 into the nation’s fuel supply.

The Answer

Therefore, in order to expand the market for ethanol, the EPA should amend its rules and extend the One-Pound Waiver to E15 (and remove the RVP condition from the E15 Waivers) and all higher ethanol blends. This would eliminate the need for a separate low-RVP blend stock for E15. A reasonable interpretation of the statutory One Pound Waiver—which applies to blends containing “gasoline and 10 percent denatured anhydrous ethanol”— can be interpreted to mean *at least* 10 percent ethanol. Accordingly, EPA should amend its One Pound Waiver regulation to apply to E15 and higher blends. Another option

is for the industry to ask Congress to amend the *Clean Air Act* to make the One Pound Waiver expressly applicable to E15 and higher ethanol blends.

The easiest administrative approach to the broad expansion of the nation's ethanol market is for EPA to amend its rules to allow for the splash blending of higher ethanol blends, including E15. This will not occur in the market today because ethanol is an octane enhancer that diminishes the need for petroleum-based aromatics. In fact, if EPA were to amend its rules and allow the splash blending of more ethanol into gasoline, fewer emissions producing oil-derived aromatic compounds would be required, and the resulting fuel would actually produce lower emissions at a lower cost to consumers — exactly what Congress intended when it adopted the *Clean Air Act*.

B. Near- to Mid-term Actions.

EPA Should Restore A Reasonable Credit For Flex Fuel Vehicles

EPA effectively eliminated FFV credits after model year 2016 when it adopted the GHG-CAFE rule. Unless FFVs dominate the light duty fleet (as they do now in Brazil), next-generation ethanol plants will not be built, and the substantial health and economic benefits of higher ethanol blends may not be realized⁶.

Since Congress passed the RFS in 2007, biofuel production has more than doubled. The overwhelming majority of biofuel has come from cornstarch ethanol. Despite the record-setting drought of 2012, cornstarch ethanol production is still on track to produce the RFS projected volume of 13.8 billion gallons of conventional biofuel for 2013.

Congress made the assumption that by 2022, corn ethanol, as compared to gasoline, would reduce GHG emissions by at least 20 percent. However, this is true today — nine years earlier than Congress suggested — and a great accomplishment of the RFS policy. Improvements in agriculture and ethanol production practices since 2007 have decreased GHG emissions from both corn and ethanol production, leading to practices with significantly greater reductions compared to petroleum. A study by Yale University's *Journal of Industrial Ecology* indicates that ethanol currently reduces GHGs by 48 to 59 percent as compared to gasoline, making it one of the most cost-effective methods for reducing GHGs in transportation fuel.⁷

Unfortunately, EPA only counts vehicle *tailpipe emissions* toward compliance with GHG standards. EPA does not include complete life cycle emissions excluding emissions generated in the production and delivery of the fuel whether electricity, gasoline, natural gas or a renewable fuel such as ethanol. As a result, all types of electric vehicles have

⁶ Brazil initiated its flex fuel vehicle (FFV) program less than ten years ago. Today, nearly 100% of LDVs sold in Brazil are flex fuel, and flex fuel dispensers are the norm nationwide.

⁷ Liska, A. J., et al., Improvements in Life Cycle Energy Efficiency and Greenhouse Gas Emissions of Corn Ethanol, *J. of Industrial Ecology*, volume 13 (1), January 21, 2009. <http://onlinelibrary.wiley.com/doi/10.1111/j.1530-9290.2008.00105.x/pdf>.

“zero” emissions during electric operation— this is clearly not the case when electricity production emissions are included. A uniform approach for vehicle emissions standards will level the playing field.

EPA’s uneven emissions method unfairly benefits electric vehicles over other technologies and does not allow for a comparison of true emission performance among various propulsion technologies and fuels. For example, an electric vehicle generates no tailpipe emissions, but an FFV fueled with E85 would compare very favorably to an electric vehicle if GHG emissions were evaluated on a life cycle basis⁸. By structuring credits to favor one technology over another, the EPA is picking winners and losers rather than allowing technologies to compete on a level playing field against a performance standard. In addition, the fact that EPA chose tailpipe instead of life cycle emission standards for the CAFE/GHG rule is inconsistent with the *Energy and Security Independence Act* RFS GHG performance threshold standards⁹.

The Administration Should Support Development of Flex Fuel Pump Infrastructure

The ethanol industry does not require tax incentives or import protection, but it does require competitive access to the consumer. An open market for fuels requires an open infrastructure that does not serve only entrenched market participants. This means that the nation must adopt an approach similar to the Brazilian “flex fuel” system model. Compared to electric and CNG vehicle systems, E30 flex fuel systems cost very little to put in place and are commercially available.¹⁰ FFVs (not optimized for higher compression, but capable of using the range of ethanol and gasoline) cost manufacturers an additional \$100 - \$200 per car.

The nation’s transportation infrastructure already accommodates E10, where 10 percent ethanol is splash blended on top of a sub-octane gasoline blend stock for oxygenate blending to take advantage of ethanol’s higher octane. Splash-blending an additional 20 percent ethanol on top of the existing E10 could easily be done at either the terminal or retail level and would require a relatively small incremental investment as existing dispensers obsolete and are replaced. A recent study calculated that a total infrastructure investment of approximately \$8 billion would be required, which over time would amount to less than \$.005 per gallon of gasoline nationwide¹¹.

C. Mid- to Long-term Actions

8 “Well-to-Wheels Analysis of Advanced Fuel/Vehicle Systems — A North American Study of Energy Use, Greenhouse Gas Emissions, and Criteria Pollutant Emissions”, May 2005, Figure 4-5.

9 “EISA required EPA to apply lifecycle greenhouse gas performance threshold standards to ensure that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces.” From <http://www.epa.gov/otaq/fuels/renewablefuels/>

¹¹2012 Stillwater Analysis

EPA should enforce Sec. 202(l) of the *Clean Air Act Amendments of 1990* by reducing gasoline aromatics, similar to EPA's successful implementation of the ban on lead, and the transition from leaded to unleaded gasoline. Congressional action is not needed. EPA has the authority to reduce carcinogenic aromatics in gasoline, which can be cost-effectively replaced by high-octane ethanol, without the need for tax incentives, import duties, or other mandates.

The Status of Aromatics — Bad to Worse

The average gallon of gasoline sold in the United States is composed of 25 to 30 percent aromatics. Petroleum refiners use an energy intensive process to convert crude oil into aromatics, which is added to gasoline to increase octane. When crude oil prices rise, subsequently do, aromatics costs, which are then passed onto the consumer. Today, aromatics are the *most expensive, least energy efficient, carbon intensive* part of a gallon of gasoline. More importantly, in recent years, scientific advances have confirmed that aromatics are the primary precursor of urban particulate matter, specifically PM_{2.5} secondary aromatic aerosols and nano-sized ultrafine particulates — also known as UFPs. UFPs are coated with polycyclic aromatic hydrocarbons (PAHs), which are the product of incomplete combustion of aromatics. Automakers confirm that the advanced engine designs needed to meet new fuel efficiency standards are likely to make UFP and PAH emissions worse, not better.

EPA's Position on Aromatics and Automakers' Needs

The health impacts of aromatics are clear, but discussions with various EPA officials and EPA research entities over the past two years have shown that EPA does not believe there is a reason for action. There is no reasonable explanation for this position. EPA's position is even more problematic when one of EPA's top modelers co-authored a recent study by the Harvard School of Public Health that concluded gasoline aromatics are the primary source of urban PM secondary aerosols, and that EPA understates such emissions by at least a factor of two. The Coalition has confirmed that EPA's complex model excludes PAHs entirely from its air toxics projections.

Automakers are interested in higher ethanol blends, such as E30, for two reasons. First, it provides the higher octane needed to operate advanced engine designs most effectively and allows automakers to more easily and cheaply meet stricter fuel efficiency and carbon standards. Second, a 2012 Maricq-Ford Motor Company study found that E30 blends reduced particulate matter and black carbon emissions by 45 percent, and NO_x and hydrocarbon emissions by more than 20 percent. PM reduction is yet another economic and health benefit of substituting ethanol for aromatics.

The Opportunity

For nearly two years, the Coalition has heard from a growing list of fuel providers, automakers, and public health experts about the need for increased octane to meet vehicle efficiency standards while reducing the health and economic threats posed by the use of aromatics. The CAAA provides both a requirement and a solution to resolve this issue over

a reasonable period of time. Aromatics can be reduced by adding higher-level ethanol blends to gasoline that would deliver automakers with the octane their engines need. Furthermore, it's possible for other fuel and vehicle alternatives to contribute to the required reductions in aromatics. For example, the conversion of natural gas to ethanol or methanol is one option. The use of electric vehicles can provide a niche solution and will have more impact over longer periods of time. Overall, the dramatic expansion in the availability of cost effective vehicles and fuel alternatives means that the time has come for EPA to enforce existing CAAA restrictions on aromatics.

The Benefits

The benefits to Americans by reducing aromatics include the following:

- Consumers would benefit from the replacement of high-priced aromatics with lower cost ethanol and other alternative fuels and vehicles.
- Gasoline PAHs — resulting from aromatics use — are proven carcinogenic, mutagenic and genotoxic compounds that are indistinguishable from the PAHs found in cigarette smoke.
- Many university based health studies link aromatics use in gasoline to human mortality and a myriad of health problems, including autism, childhood obesity, premature birth, birth defects, infant brain damage along with respiratory conditions and cancers.
- Automakers would have growing access to higher-octane, cleaner gasoline with positive emissions benefits, including reduced PM.
- Reduced state, federal, and private health care costs.
- The nation could easily reach transportation fuel independence.
- A favorable state, local, and industry reaction for political leadership on this issue.

The nation is at a stage with aromatics that is similar to past political challenges. It took 30 years for EPA to remove lead from gasoline, and decades to recognize the health effects caused by smoking. We cannot delay any longer actions that will benefit the health of all Americans and lead to a more secure energy future.