Comments of

Farmers Union Enterprises
National Farmers Union
South Dakota Farmers Union
Nebraska Farmers Union
Glacial Lakes Energy, LLC
Clean Fuels Development Coalition
Urban Air Initiative
Wisconsin Farmers Union

On the Environmental Protection Agency's Proposed Rule regarding

Modifications to Fuel Regulations to Provide Flexibility for E15

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INTRODUCTION

Commenters welcome the Administration's commitment to remove the last remaining barriers to production and use of E15, which served for years to deny consumers the full benefits of a superior fuel option and operated as an unjustified restriction on ethanol's ability to compete in the fuel marketplace. The fact that it took EPA 28 years to fully embrace E15 as a component of fuel on equal footing with other fuel components cannot be reconciled with the Agency's mandate to advance renewable fuels and clean octane, reduce harmful emissions, and promote energy independence in our fuel supply through the greatest achievable technologies. Nevertheless, we are encouraged by the initial steps taken to rectify that past inaction reflected in the proposed rulemaking.

In particular, Commenters support the long-overdue recognition that E15 is substantially similar to E10 in all relevant and material respects. Commenters also welcome the proposed evolution of EPA's prior interpretations of the 1-psi waiver under 211(h)(4), to now recognize that the reference to "fuel blends containing gasoline and 10% denatured anhydrous ethanol" in the statute establishes "a lower limit, or floor, on the minimum ethanol content" rather than a cap.

However, Commenters' enthusiasm for the Agency's proposal to fully embrace E15 is tempered by the manner in which it is accomplished, which would continue in place outdated and unsupported limitations on E15, place the burden on ethanol producers to justify expanded use of sub sim ethanol blends beyond E15, and continue to limit the broader use and availability of ethanol, contrary to Congressional intent. While we appreciate EPA's commitment to reviewing the wisdom of its prior policies on a "continuing basis" with respect to ethanol, the proposal to re-establish prior E15 211(f)(4) waiver conditions as limits on a sub sim determination under 211(f)(1) is not supported by the legal framework of the CAA or the evidence as it exists today.

Commenters are also concerned by statements and conclusions underlying the proposed rulemaking, including EPA's continued reliance on outdated and biased historical models and studies, which perpetuate false narratives and understandings about ethanol's impacts relative to other fuel options. This includes the notion that sufficient information regarding the recognized benefits and impacts of mid-level ethanol blends does not exist.

Commenters are also deeply concerned by the suggestion that the move to E15 would free up refiners to relax controls on their side of the blending equation, particularly as it relates to the sulfur, benzene and aromatics content of CBOB, and thereby undo or undermine the recognized benefits that the move to year-round E15 ethanol would yield. Such statements are illustrative of EPA's broader complicity in failing to respond to the true recognized threats to human health and the environment in our nation's fuel supply.

With the designation of E10 as a certification test fuel, the time has come to put ethanol on equal footing with other certification fuels and fuel additives, as Congress

intended. To the extent the Proposed Rule fails to do so, and instead maintains historical limits and conditions on ethanol, without fully accounting for new evidence and changed circumstances, the Proposed Rule does not comport with existing law, Congressional intent and best available evidence.

For the reasons stated and incorporated herein, we respectfully request that EPA recognize and clarify that ethanol is not only substantially similar, but in fact identical to an additive used in the certification of vehicles, and that the Clean Air Act's allowance or exception for "substantially similar" fuels and fuel additives in Section 211(f)(1) does not authorize or support capping ethanol content at E15 or otherwise limiting its availability to consumers.

INTERESTED PARTIES JOINING IN THIS COMMENT

Farmers Union Enterprises ("FUE") is the organization that oversees Farmers Union Industries, a diverse portfolio of farm-related businesses, including ethanol plants. FUE serves to actively promote and advocate for rural economic development and the interests of family farmers and ranchers across the upper Midwest. The board of FUE is made up of presidents from each of the five-state Farmers Union organizations.

National Farmers Union, South Dakota Farmers Union and Nebraska Farmers Union are nonprofit organizations that work to protect and enhance the economic well-being and quality of life for family farmers, fishers, ranchers, and rural communities, including those who grow corn for its use in ethanol fuel blends.

Urban Air Initiative ("UAI") is a non-profit organization dedicated to improving air quality and protecting public health by reducing vehicle emissions. UAI is focused on increasing the use of clean burning ethanol in our gasoline supply to replace harmful aromatic compounds in gasoline. UAI is helping meet public policy goals to lower emissions and reduce carbon in our environment through scientific studies and real-world data to promote new fuels, engine design, and public awareness.

Glacial Lakes Energy, LLC was formed by the Glacial Lakes Corn Processors. Glacial Lakes Corn Processors ("GLCP") is a South Dakota cooperative with 4,100 shareholder/investors who reside primarily in eastern South Dakota. GLCP is the sole owner of two large ethanol production facilities that annually produce over 240 million gallons of high octane, cleaner-burning ethanol. The company has been extremely successful in meeting its original purpose of creating additional value for the area's rural economy by returning hundreds of millions of dollars to the local economy and providing good, quality jobs.

Clean Fuels Development Coalition is a broad-based organization of parties dedicated to educating the public, regulators and other stakeholders regarding the benefits of clean burning, renewable biofuels, including ethanol.

Commenters join in and adopt the comments to the Proposed Rule submitted by National Farmers Union, as if fully stated herein.

Commenters also reference and incorporate, as if fully stated herein, the following prior comments submitted to EPA in connection with related proposed rulemakings: (1) *Comments of National Farmers Union, South Dakota Farmers Union, Minnesota Farmers Union, Montana Farmers Union, North Dakota Farmers Union, Wisconsin Farmers Union, Glacial Lakes Energy, LLC, and Siouxland Ethanol, LLC on* the *EPA's Renewable Enhancement and Growth Support (REGS) Rule*, 81 Fed. Reg. 80828 (Nov. 16, 2016) Docket ID No. EPA-HQ-OAR-2016-0041 (February 16, 2017); (2) *Comments of Urban Air Initiative, et al., on the EPA's Renewable Enhancement and Growth Support (REGS) Rule*, 81 Fed. Reg. 80828 (Nov. 16, 2016) Docket ID No. EPA-HQ-OAR-2016-0041 (February 16, 2017); and (3) *Comments of Clean Fuels Development Coalition, Environmental and Energy Study Institute, Farmers Union Enterprises, Governors' Biofuels Coalition, Minnesota Farmers Union, Montana Farmers Union, National Farmers Union, Nebraska Ethanol Board, North Dakota Farmers Union, South Dakota Farmers Union and Urban Air Initiative on the Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks Advanced Notice of Proposed Rulemaking and Draft Regulatory Impact Analysis*, Docket ID Nos. NHTSA-2018-0067; EPA-HQ-OAR-2018-0283; FRL-9981-74-OAR (October 26, 2018).

COMMENTS

1. Expanding E15 is long overdue but the focus of the Proposed Rule is misplaced

Congress has long recognized and supported an expanding role for ethanol in our national fuel supply. The legislative history of the CAA shows that ethanol-enhanced high octane fuels were recognized as the best available option for replacing octane from aromatic hydrocarbons and thereby reducing toxic emissions.[1]

Despite these expressions of Congressional support for ethanol, ethanol has operated under tighter controls and restraints than other fuels. This disparate treatment has placed ethanol at a competitive disadvantage in the marketplace relative to conventional fuels.

EPA's inaction with respect to ethanol has not been without consequence. Despite clear mandates to reduce the amount of harmful aromatic chemicals in the nation's fuel supply to the greatest achievable extent (using "maximum achievable control technology"), over the last ten years, refiners have continued adding aromatics to fuels, thus circumventing the reductions that Congress assumed would occur through the increased use of ethanol. As a result, today BTEX aromatic hydrocarbons still

[1] The Proposed Rule acknowledges that "Congress intended to encourage the use of ethanol as a means of reducing dependence on foreign oil and making use of excess agricultural production."

comprise 25–30 percent of the gasoline pool.[2] EPA's stifling restrictions on ethanol content most certainly played a role in this failure to reduce the presence of harmful aromatics in the nation's fuel supply.

With the designation of E10 as a certification test fuel, however, ethanol's status under the CAA changed. When that happened ethanol became a fuel additive used in certification of vehicles, thereby allowing increased concentration of ethanol under 211(f)(1) (the "substantially similar" or "sub sim" provision). As a result of this change, if EPA wishes to control the use of higher blends in standard (non-FFV) vehicles, the legal burden of proof is on EPA to prove mid-level ethanol blends (E20-E40) damage emissions control systems or exacerbate tailpipe emissions.

Unfortunately, EPA does not see it the same way. Despite evidence that E15 is no worse, and in many respects superior to E10, EPA is still insisting that E15 operate under the same conditions and restrictions that it operated under before ethanol became a component of certification fuel. Even more concerning, EPA is proposing to repurpose the sub sim provision as the primary mechanism for regulating and restricting ethanol fuel blends, regardless of their actual sub sim chemistry, additives, and properties. The rationales offered for this interpretation are unavailing and at odds with the traditional approach to and intent behind sub sim.[3]

As with E15, mid-level ethanol blends are not compliant with the sub sim provisions and provide better performance, reduce emissions, and further the goals of Congress. For the reasons that follow, Commenters submit that the burden should be on EPA to justify continuing past obsolete restrictions on the use of mid-level ethanol blends under the more scrutinizing standard of 211(c), lest the industry should have to wait another 28 years for EPA to acknowledge that E30 is no worse - and on balance - significantly better than E15.

2. Proposed Rule's narrow focus ignores the bigger picture

Recognizing the broad issues that exist regarding EPA's mismanagement of the Renewable Fuel Standards (RFS) program and its failure to protect the public from the harmful emissions from traditional fossil fuels, commenters are disappointed that in making the case for E15, EPA has focused so narrowly on RVP and volatility.

Admittedly, the RVP waiver was an issue that EPA needed to contend with due its overwrought past interpretations of 211(h)(4), which effectively boxed ethanol into an unnecessary and unjustified corner. For this reason, Commenters agree with EPA's conclusion that the term "containing" as used in CAA Sec. 211(h)(4) in the phrase "fuel blends containing gasoline and 10% denatured anhydrous ethanol" should be

[2] *See, e.g.,* CAA sec. 211(k)(3)(A)(1) and (ii) (''The aromatics hydrocarbon content of the reformulated gasoline shall not exceed 25 percent by volume.'')

[3] See *Comments of Urban Air Initiative, et al., on the EPA's Renewable Enhancement and Growth Support (REGS) Rule*, 81 Fed. Reg. 80828 (Nov. 16, 2016) Docket ID No. EPA-HQ-OAR-2016-0041 (February 16, 2017), at pp. 8-14.

interpreted "as establishing a lower limit, or floor, on the minimum ethanol content for a 1-psi waiver from the volatility requirements expressed in CAA Sec. 211(h)(1), rather than an upper limit on the ethanol content."[4]

However, the fact remains that emissions due to gasoline volatility are a small component of vehicle emissions, so small in fact that, as the Proposed Rule recognizes, EPA does not have any volatility requirements on gasoline outside of the summer season.[5]

Additionally, at no point does EPA recognize that the RVP of E30 is actually lower than E15. In fact, testing by the National Renewable Energy Laboratory (NREL) confirms that in most cases, E30 blends' volatility will be the same as E0 blends.[6] For this reason, Commenters find the proposed rulemaking's focus on applying the 1-psi waiver to blends up to E15 - knowing full well that available technology exists, in the form of E30, that would completely eliminate the evaporative emission problem that prompted the 1-psi waiver in the first place - an abdication by EPA of its obligation to pursue best available technology as it relates to such emissions.

By focusing on RVP and evaporative emissions, EPA also ignores the broader obligations it has with respect to other emissions that cause or contribute to significantly greater harm. EPA's limited proposal would continue to support the use of BTEX in gasoline to meet octane requirements. As described more fully in Section 5 below, aromatics/BTEX is not only the primary source of the most dangerous urban air toxics, but also the dominant source of $PM_{2.5}$ secondary organic aerosols (SOAs), which carry the toxics long distances, and are major contributors to ground level ozone. EPA has projected that by 2020, 85% of the $2 trillion in savings from the 1990 CAAA will come from reductions in ambient PM, and that its models under-predict the amount of the fine and ultra-fine particulates that are caused by gasoline aromatics/BTEX.[7]

In the face of these dire facts, it is concerning that the Proposed Rule makes no mention of these contributions, which expanded ethanol would offset. One could even view comments about the effect on blendstocks, as leaving the door open to refiners to increase benzene content.[8] Such dereliction of duty to address the known public harms

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[4] 84 Fed. Reg. at 10591. (emphasis added.)

[5] *Id.* at 10,585.

[6] A. Williams and T.L. Alleman, National Renewable Energy Laboratory, *Blender Pump Fuel Survey: CRC Project E-95-2*, Appendix B (May 2014).

[7] U.S. Environmental Protection Agency/Office of Air and Radiation, *The Benefits and Costs of the Clean Air Act from 1990 to 2020, Final Report – Rev. A*, pp. 7-3, 4-25 (April 2011).

[8] 84 Fed. Reg. at 10,604. ("If E15 use becomes widespread in the longer term, refiners may adjust the base blendstock to accommodate the additional ethanol. . . . For other fuel properties, such as sulfur and benzene content, refiner control could be relaxed slightly for E15 blendstocks with the finished market E15 blend still meeting with the regulatory limits. Moving from E15 splash blends to match blends may

from aromatics cannot be squared with the Proposed Rule's overreaching efforts to maintain tight controls and limits on ethanol – a proven cleaner and renewable fuel.

3. Proposed Rule continues to treat ethanol differently relative to other sub sim components of certification fuel and has the burdens reversed

The legal framework of the CAA establishes a clear path and sequence with respect to regulation of fuel and fuel additives. The starting point is the prohibitions at CAA sec. 211(f)(1). The proposed rule comments acknowledge this path, beginning at page 10596, which reads:

> In the CAA Amendments of 1977, Congress established CAA sec. 211(f)(1), which prohibits manufacturers from first introducing into commerce any fuel or fuel additive for general use in light duty vehicles that is not ''substantially similar to any fuel or fuel additive utilized in the certification of any model year 1975, or subsequent model year, vehicle.'

The proposed rulemaking also recognizes how EPA can act to restrict sub sim fuel or fuel additives under the CAA:

> If [EPA] were to later find the fuel or fuel additive that satisfies physical and chemical sub sim characteristics which "may reasonably be anticipated to endanger public health or welfare" or "impair to a significant degree the performance of any emission control device or system," either in general or in particular vehicles or circumstances, we have authority to regulate that fuel or fuel additive under CAA Sec. 211(c), which provides that we may by regulation place controls or prohibitions on fuels and fuel additives to protect the public health or welfare or protect emission control devices or systems.

The understanding that 211(c) was an option available to EPA for controlling ethanol (if a case could be made for such controls) is obvious from the plain reading of the statute, which provides that determinations under 211(c) are to be made "on the basis of information obtained under subsection (b)," which includes references to studies EPA was directed to conduct regarding the effects of the increased use of ethanol in gasoline.[9]

Thus, if a fuel or fuel additive is sub sim to any fuel used in the certification of any model year vehicle after 1975, the CAA establishes a presumption in favor of the right to introduce that fuel or fuel additive into commerce, unless EPA acts to restrict or limit the fuel or fuel additive under 211(c). The clear intent of these provisions is to place the burden on EPA to justify the imposition of a control or prohibition on a fuel or fuel

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then undo some small emission reductions occurring when E15 is made from refinery blendstocks designed for E10.")

[9] 42 U.S.C. §211(b)(4)(A).

additive that is "substantially similar" to a certification test fuel under Section 211(c)(1), just as it did when EPA first promulgated RVP standards for gasoline and alcohol blends in 1989 and 1990.[10]

At the time the original waiver for E15 was established in 2011, ethanol was not a component of test fuels used in the certification of any model year vehicle. Accordingly, ethanol proponents sought and received a waiver from the sub sim prohibition under CAA sec. 211(f)(4). The proposed rulemaking refers to this alternative path at different points:

> If a fuel or fuel additive is not sub sim, a fuel or fuel additive manufacturer may obtain a waiver under CAA sec. 211(f)(4) if the manufacturer can demonstrate that the new fuel or fuel additive ''will not cause or contribute to a failure of any emission control device or system (over the useful life of the motor vehicle, motor vehicle engine, nonroad engine, or nonroad vehicle in which such device or system is used) to achieve compliance by the vehicle or engine with the emission standards with respect to which it has been certified.'' [11]

Ethanol proponents could have made the case in 2011 that ethanol was sub sim to the components of certification fuel in 2011. In seeking a waiver under CAA sec. 211(f)((4) they were respecting the order and framework of the CAA.

Significantly, on January 1, 2017, the certification test fuel for Tier 3 motor vehicles was changed from E0 to E10. This change was made in recognition of "the widespread use of E10 in the marketplace."[12] Under the accepted framework of the CAA as outlined in the Proposed Rule (and above), this change in the certification test fuel changes the way ethanol can be regulated under the CAA. Whereas before the burden was arguably on the ethanol industry to justify the use of ethanol beyond E10, now the burden is on EPA to demonstrate that increased ethanol content is harmful.

EPA acknowledges this change, and its implications for ethanol regulation, in the proposed rulemaking at page 10,602:

> One implication of a sub sim interpretation that includes E15 under CAA sec. 211(f)(1) would be that a waiver under CAA sec. 211(f)(4) will no longer be necessary for E15 to be introduced into commerce. This would in effect remove the conditions of the E15 partial waivers imposed on fuel and fuel additive manufacturers, in the absence of any limitations on the sub sim interpretation. This would mean that the conditions in the E15

[10] *See* 84 Fed. Reg. at 10,600 (describing history and source of RVP standards).

[11] 84 Fed. Reg. at 10,586.

[12] *Id.* at 10,597.

> partial waivers designed to limit the introduction into commerce of E15 to only MY2001 and newer light-duty motor vehicles would not apply.[13]

Similarly, in footnote 76 of the proposed rulemaking, EPA concedes:

> [U]nder the new substantially similar interpretive rulemaking proposed in Section II.C, such that it includes E15, such waiver conditions would no longer apply to fuel and fuel additive manufacturers."

Commenters submit that this is the only reasonable interpretation of the 2017 designation of E10 as a certification test fuel, and that, going forward, EPA bears the burden to justify controls or prohibitions on the introduction and use of ethanol as a fuel additive under 211(c).

Unfortunately, rather than accept the burden to justify continuing limitations on ethanol fuel additives under 211(c), in the proposed rulemaking, EPA declares its intent to circumvent the CAA framework by grandfathering in the waiver conditions previously imposed under 211(f)(4). 84 Fed. Reg. at 10593 ("In this action, we are maintaining all of the CAA sec. 211(f)(4) waiver conditions for E15 as they currently apply to fuel and fuel additive manufacturers.") EPA proposes to accomplish this by re-establishing those waiver conditions as either (1) conditions on the interpretation of substantially similar under 211(f)(1); or (2) restrictions on fuel additive usage under 211(c).

The first proposed reinterpretation (making the conditions part of a new sub sim interpretation) is a non-starter, as it would circumvent Congressional intent and the established framework and standards for imposing restrictions on fuel and fuel additives under 211(c).[14] (*See* Section 4 below.)

The second option, while seemingly tied to 211(c), is equally problematic, as none of the conditions EPA seeks to continue were originally promulgated under 211(c), nor are they supported by a current proffer of evidence sufficient to meet EPA's burden for imposing controls or prohibitions under 211(c)(1).[15] While the Proposed Rule makes

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[13] *Id.* at 10,602.

[14] Commenters incorporate the points and authorities set forth in the *Comments of Urban Air Initiative, et al., on the EPA's Renewable Enhancement and Growth Support (REGS) Rule*, 81 Fed. Reg. 80828 (Nov. 16, 2016) Docket ID No. EPA-HQ-OAR-2016-0041 (February 16, 2017), at pp. 8-14.

[15] Section 211(c)(1) of the CAA mandates that before controlling existing fuels and fuel additives, EPA must find that a fuel or fuel additive (1) "causes, or contribute to, air pollution which may reasonably be anticipated to endanger the public health or welfare" or (2) causes "emissions products" that "impair to a significant degree the performance of any emission control device or system which is [or would soon be] in general use." 42 U.S.C. § 7545(c)(1). In subparagraph 211(c)(2)(A) Congress further required the Agency to consider all relevant "medical and scientific evidence . . . including . . . other feasible means of achieving the emission standards" required by the Act. *Id.* § 7545(c)(2)(A). In an adjacent provision, subparagraph 211(c)(2)(B), Congress similarly limited EPA's discretion to prevent damage to vehicle emissions controls by requiring the Agency to consider "scientific and economic data, including a cost benefit analysis comparing" feasible regulatory alternatives, and to hold "public hearing[s] and publish findings" upon request. 42 U.S.C. § 7545(c)(2)(B).

passing references to historical limitations on ethanol use established under CAA sec. 211(c), the Proposed Rulemaking does not purport to make the case for re-establishing waiver conditions for E15 under 211(f)(4) as controls or prohibitions on fuel or fuel additives under the heightened standards of 211(c).

To be clear, commenters to not dispute EPA's ability to control or prohibit the use of sub sim fuels or fuel additives to the extent they are found to cause or contribute to emissions that endanger the public health or welfare or would impair to a significant degree the performance of any emission control device or system. However, EPA has to make the case for such limits in accordance with the standards set forth in 211(c). For the reasons set forth below, the evidence contained in the proposed rulemaking does not meet this statutory burden.

4. <u>EPA's proposal to cap ethanol content through new sub-sim interpretations is contrary to the CAA, the evidence, and its own statements</u>

As noted above, what EPA casts as an update of its past interpretations of sub sim, is in fact a naked attempt by EPA to impose outdated and unjustified restrictions and conditions on the use of ethanol, outside of the traditional framework and intended operation of the CAA.

Before addressing commenters' objections to EPA's proposed sub sim interpretive rulemakings, however, Commenters want to first identify those statements and interpretations relating to the sub sim statute with which they agree.

First, Commenters agree that under CAA sec. 211(f)(1), the sub sim determination need only demonstrate that E15 is sub sim to a fuel used in certification of a 1975 or later model year vehicle or engine, not substantially similar to all certification fuels required and used historically.

Second, Commenters agree that the scope of vehicles and engines to be considered in determining whether a fuel is substantially similar under CAA sec. 211(f)(1) *is significantly narrower* than the scope of vehicles and engines that must be considered by EPA for a waiver to be granted under CAA sec. 211(f)(4). (emphasis added.)

Third, EPA correctly observes that E15 would qualify as substantially similar to Tier 3 E10 certification fuel under 211(f)(1) under any definition of substantially similar one might apply. In support of this statement, EPA cites evidence relevant to each of the factors considered relevant to a sub sim determination, including the following:

- "[W]e believe that the small changes in exhaust emissions from E15 relative to Tier 3 E10 certification fuel used in Tier 3 certified vehicles are within the scope of what we have determined to be sub sim in our prior sub sim interpretive rulemakings. Therefore, we believe that E15

is sub sim to Tier 3 E10 certification fuel from the perspective of exhaust emissions."[16]

- "[T]o the extent that E15 displaces E10 in the short term, E15 is expected to lower the volatility of in-use gasoline by as much as 0.1 psi."

- "Ethanol also causes changes in the volatility profile of the blended fuel, typically lowering the mid-point distillation temperature (T50) significantly, and the 90 percent temperature (T90) slightly."

- "Use of E15 blends will have other criteria pollutant emission impacts beyond those related to volatility described above. Assuming E15 is made from the same BOB as E10, we expect the additional 5 volume percent ethanol to further dilute hydrocarbon fuel components such as aromatics, producing changes in several exhaust emissions such as NOX, NMOG, and benzene."

- "[B]ecause there are not refueling, diurnal, or running loss evaporative emission impacts of E15 relative to Tier 3 E10 certification fuel apart from RVP, we do not believe these evaporative emission impacts are relevant to our proposed interpretation of sub sim." 84 Fed. Reg. at 10600.

- "For materials compatibility and driveability, we expect that due to E15 being used as a service accumulation fuel for evaporative emissions aging, as well as our conclusions for MY2001 and newer light-duty motor vehicles regarding materials compatibility and driveability in the E15 partial waivers, E15 would be sub sim to Tier 3 E10 certification fuel." 84 Fed. Reg. at 10,601.

As noted in the proposed rulemaking, EPA has interpreted the ''substantially similar'' provision four different times in the past – in 1980, 1981, 1991 and 2008.

The 1981 interpretive rulemaking, which superseded the original 1980 rule, sought to broaden EPA's interpretation of the term "substantially similar" as used in 211(f)(1) to enable fuel and fuel additive manufactures to determine whether their fuels are covered or excluded from the prohibitions of 211(f)(1) and reduce the burdens on manufacturers and EPA for processing waivers for fuels and additives which would otherwise be required. In defining sub sim, EPA was intent to avoid actions that would

[16] In regard to exhaust emissions, the proposed rulingmaking further states: "However, we seek comment and request any additional information related to the potential effects on the exhaust emissions of E15 compared to Tier 3 E10 certification fuel, particularly in Tier 3 certified vehicles given the limited data currently available."

"lower gasoline yields" or "cause hardships for refiners."[17] After considering different options, the EPA settled on the ASTM standards as a reasonable measure or proxy for sub sim. The rationale offered for using the ASTM standards focused on the stated goals of the ASTM standards: "to maximize gasoline production, minimize production costs, and maintain sufficient gasoline quality to operate in vehicles satisfactorily."[18] In adopting the ASTM standards, EPA observed:

> All of the properties which are specified both by the certification regulations and by ASTM *are of equal or less stringency* in the ASTM standards, *thereby allowing flexibility which would not be available if a more strict interpretation were followed*.[19]

Consistent with the goal of flexibility, EPA stated that "compliance with the detailed requirements of the ASTM volatility specifications is not the intent of this interpretation; rather it is EPA's intent to ensure that *gasolines resemble certification fuels in general*."[20]

Notably, at the time of the 1981 proposed rulemaking, the industry was still focused on fossil fuels and ethanol was not yet a viable fuel option. Even then, commenters to the 1981 proposed rule noted that a 2.0 percent by weight oxygen limit was too conservative and that a "3.5 percent [by weight] limit (near to the oxygen content of gasohol) would be more appropriate."[21]

Both the 1981 and 1991 Rules affirmed how the different provisions of the CAA are intended to operate. The 1981 Rule described the context for EPA's action, noting:

> Fuels for fuel additives which are "substantially similar" to those used in a 1975, or subsequent model year certification are thus excluded from the section 211(f)(1) and (3) prohibitions. For those fuels or fuel additives which are not "substantially similar," the fuel or fuel manufacturer may apply for a waiver of the section 211(f)(1) and (3) prohibitions, as provided in section 211(f)(4).[22]

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[17] *Id.* (EPA specifically declined to designate properties that were "not routinely measured in the refinery and could cause hardships to refiners.")

[18] 46 Fed Reg. at 38585 (July 28, 1981).

[19] *Id.* (emphasis added.) The 1981 Rule notes that the one property that the ASTM standard did not specify in common is that of maximum aromatics. EPA rationalizes adopting a sub sim standard that does not include a specification for maximum aromatics, reasoning "this specification may not be among those routinely measured at the refinery and as such could represent a hardship to manufacturers."

[20] *Id.* (emphasis added)

[21] *Id*. at 38,583.

[22] *Id.* at 38,582.

In the 1991 Rule, EPA further noted the role of section 211(c) as a means for EPA to control or prohibit specific blends of otherwise substantially similar fuels or fuel additives that it determines are harmful to humans, the environment or emission control devices.[23]

EPA acknowledges that it "[has] not previously imposed conditions in substantially similar interpretive rulemakings designed to limit the applicability to certain classes of vehicles."[24] Despite this history, true to its historical biases, EPA's current formulation of the sub sim determination eschews equal treatment of ethanol as a component of certification fuel and instead proposes to reinterpret sub sim as presumptively incorporating the prior 211(f)(4) waiver conditions on ethanol content.

The purported justification for this end run around Congressional intent, 211(c) and its own prior rulemakings is found on page 10,602. There EPA observes that "the language of CAA sec. 211(f)(1) does not address whether and how EPA can restrict its determination that a particular fuel is 'substantially similar' to a certification fuel."[25] In the face of this claimed silence on the issue, EPA concludes that "it is reasonable to interpret this provision as allowing EPA to apply restrictions on a sub sim determination, where the restrictions are intended to avoid the kinds of problems that prompted the prohibition against introduction into commerce."[26] The sole justification offered by EPA for this new restrictive approach to sub sim – "the fact that there have now been multiple certification fuels since 1977, when CAA sec. 211(f)(1) was first enacted" – comes without explanation, connection or context.[27]

From this threadbare analysis, EPA declares its intent to interpret a future determination of sub sim under 211(f)(1) as incorporating the 211(f)(4) waiver conditions and limitations, stating:

> "*Our proposed [sub sim] interpretation is limited to gasoline that contains only ethanol content up to 15 percent* as this is the only oxygenate that we have sufficient data and information to support at this time. ….. ***Therefore, our proposed interpretation of sub sim for gasoline would interpret gasoline ethanol blends containing up to 15 percent ethanol as sub sim***, while keeping the oxygen content limit of 2.7 weight percent for other oxygenates."

[23] 56 Fed. Reg. at 5354 (Feb. 11, 1991)
[24] 84 Fed. Reg. at 10,602.
[25] *Id.*
[26] *Id.*
[27] *Id.*

The problems with this approach are serious and many.[28] First, as set forth in Section 3 above, the fundamental premise of this proposed rulemaking action is misplaced, as the CAA does address whether and how EPA can restrict a fuel or fuel additive that might otherwise be considered sub sim – in section 211(c) of the CAA.

Second, imposing an E15 cap on sub sim ethanol is contrary to Congressional intent. EPA notes that "when Congress intended to impose an upper limit on the content of a particular compound or property of gasoline it did so."[29] When it comes to ethanol, the legislative history is clear: Congress did not intend to impose an upper limit on ethanol blends such as high octane E30 when used as clean octane replacements for toxics aromatics as contemplated under section 202(l) of the Clean Air Act. In fact, Congress clearly intended the opposite, as evidenced by the extensive legislative history, particularly in the United States Senate floor debates.[30] When coupled with Congressional targets for renewable fuels established under RFS2, EPA's artificially constructed cap on ethanol content clearly defies Congressional intent.

Third, capping sub sim ethanol at E15 is contrary to the evidence. The proposed rulemaking cites to numerous studies that confirm the non-material differences between E10 and E15. These same studies, and others, recognize that E20 and E30 mid-level ethanol blends are similarly not likely to produce significant differences in emission impacts, material compatibility, and driveability compared to E30. In the case of evaporative emissions, studies show that the RVP of E30 is actually lower than E10.[31] Additionally, as discussed in the next section, use of E30 high octane fuel as an octane replacement for aromatics substantially reduces emissions of the most dangerous pollutants, including mobile source air toxics targeted by Congress in the 1990 Clean Air Act Amendments (Section 202(l)).[32] This effect is conceded by EPA in the proposed rulemaking, where it notes during the expansion of E10 blending between 2007 and

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[28] Commenters incorporate the points and authorities set forth in the *Comments of Urban Air Initiative, et al., on the EPA's Renewable Enhancement and Growth Support (REGS) Rule*, 81 Fed. Reg. 80828 (Nov. 16, 2016) Docket ID No. EPA-HQ-OAR-2016-0041 (February 16, 2017), at pp. 8-14.

[29] 84 Fed. Reg. at 10,591

[30] *See, e.g.*, 136 CONG. REC. S2430, S2435-36 (1990); *see also* Gary C. Bryner, BLUE SKIES GREEN POLITICS: THE CLEAN AIR ACT OF 1990 AND ITS IMPLEMENTATION 153-54 (1995); *see also* Henry A. Waxman, *An Overview of the Clean Air Act Amendments of 1990*, 21 ENVTL. L. 1744-45 (1991).

[31] Robert L. McCormick and Janet Yanowitz, National Renewable Energy Laboratory, *Effect of Ethanol Blending on Gasoline RVP* (Mar. 16, 2012).

[32] Numerous studies have shown that E30/94 AKI fuels reduce particulate-borne toxics (e.g., polycyclic aromatic hydrocarbons, PAHs, etc.) by 45-50% in direct injection (DI) engines, and 80+% in port fuel injection (PFI) engines by displacing/diluting aromatic hydrocarbons, and by improving combustion efficiencies (higher oxygen content and octane, improved sensitivity, etc.). *See, e.g*. Zhang et al., *A Comparison of Total Mass, Particle Size and Particle Number Emissions of Light-Duty Vehicles Tested at Haagen-Smit Laboratory from 2009 to 2010,* California Air Resources Board, 2011; Maricq et al. (2012) *The Impact of Ethanol Fuel Blends on PM Emissions from a Light-Duty GDI Vehicle*, Aerosol Science and Technology, 46:5, 576-583, DOI:10.1080/02786826.2011.64878.

2012, that "aromatics levels were observed to decline by a few volume percent while pump octane levels stayed constant."[33]

Fourth, capping sub sim ethanol at E15 defies basic logic and commonsense. EPA cannot credibly claim that E15 is substantially similar to E10 in all respects, and yet also find that E16 is not substantially similar and therefore prohibited from introduction into commerce.

In sum, E30/94 AKI high octane fuel blends contain the identical fuel additive used in today's gasoline certification fuel (E10). EPA's proposed rulemaking misinterprets and misapplies section 211(f) of the Clean Air Act by imposing a condition on sub sim that would cap substantially similar ethanol at E15, and prevent E16 or any higher blend from being considered sub sim, even if the evidence supports it. A correct interpretation of the Clean Air Act would affirm that mid-level ethanol blends such as E30/94 AKI are sub sim to E10 certification fuel and may be used in non-flex fuel, or standard vehicles.

5. Proposed Rule ignores real harm to public health and welfare from aromatics

In the proposed rulemaking, EPA props up the value of gasoline by allowing higher-cost aromatics to be produced and used in retail gasoline to enhance octane, while simultaneously limiting the availability of clean octane from ethanol. The burden of this choice falls on the public who suffer adverse health effects from the burning of aromatic-laden fuels.[34]

In the CAAA, Congress gave EPA a broad mandate to require maximum achievable reductions in MSATs and other gasoline-related pollutants.[35] Congress

[33] 84 Fed. Reg. at 10,604.

[34] *See* Athanasios Valavanidis et al., *Airborne Particulate Matter and Human Health: Toxicological Assessment and Importance of Size and Composition of Particles for Oxidative Damage and Carcinogenic Mechanisms*, 26 J. ENVIRON. SCI. AND HEALTH 4, 229-362 (NOV. 2008); *see also* Ning Li et al., *Ultrafine Particulate Pollutants Induce Oxidative Stress and Mitochondrial Damage*, 111 ENVIRON. HEALTH PERSPECTIVES 4, 455-60 (Apr. 2003); *see also* Jesus A. Araujo and Andre E. Nel, *Particulate matter and atherosclerosis: role of particle size, composition and oxidative stress*, 6 PARTICLE AND FIBRE TOXICOLOGY 24 (Sept. 2009); CFDC Midterm Evaluation Comments (Oct. 2017): EPA, *Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025, Draft Technical Assessment Report* (2016) at 10-36 ("Changes in ambient concentrations of ozone, PM2.5, and air toxics that will result from the program are expected to affect human health by reducing premature deaths and other serious human health effects, as well as other important improvements in public health and welfare. Children especially benefit from reduced exposures to criteria and toxic pollutants, because they tend to be more sensitive to the effects of these respiratory pollutants. Ozone and particulate matter have been associated with increased incidence of asthma and other respiratory effects in children, and particulate matter has been associated with a decrease in lung maturation.")

[35] Section 202(l) of the CAAA addressing mobile source-related air toxics requires EPA to promulgate (and from time to time revise) regulations to control hazardous air pollutants from motor vehicles and

specifically called out the serious health dangers of the gasoline aromatic compounds, benzene, ethyl-benzene, toluene, and xylene, commonly referred to collectively as BTEX. It was widely understood that petroleum refiners synthesize BTEX from crude oil to increase gasoline octane levels.[36] BTEX compounds have been long regarded as the most toxic, energy- and carbon-intensive octane enhancers.[37]

Based on these concerns, Congress specifically directed EPA to regulate aromatics under the CAA as a class of chemicals that would be collectively considered "hazardous air pollutants" under Section 202(l). Hazardous air pollutants," as that term is used in section 202(l) of the Act, is synonymous with "mobile source air toxics" (MSATs) and includes the aromatic compounds that make up approximately 20%-30% of light-duty motor vehicle fuel in the United States.[38] On combustion, these aromatic hydrocarbons produce benzene, toluene, ethylbenzene, xylene, 1,3-butadiene, polycyclic aromatic hydrocarbons (PAHs).[39] Additionally, the combustion of aromatics in motor vehicle engines produces dangerous levels of fine and ultra-fine particulate matter (PM2.5 and UFPs), causing a range of environmental and human health effects, including thousands of deaths every year.[40] Finally, the combustion of aromatics in

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motor vehicle fuels. The regulations are further required to contain standards that the Administrator determines "reflect the greatest degree of emission reduction achievable through the application of technology which will be available" (sometimes referred to as "Maximum Achievable Control Technology" ("MACT")).

[36] *See, e.g.*, C.A. Hall et al., *Effect of Lead Antiknock Regulations on Gasoline Aromatics and Aromatic Exhaust Emissions*, 112 NATO ASI SERIES 59 (1983) ("When lead antiknocks are restricted, refiners generally increase the aromatic content of motor gasolines to recover the lost octane numbers."); *see also*, T.R. Hughes et al., *Catalytic Processes For Octane Enhancement By Increasing the Aromatics Content of Gasoline*, 38 STUDIES IN SURFACE SCIENCE AND CATALYSIS 317 (1988) (noting major progress in methods for enhancing gasoline octane by increasing aromatic content and presenting new aromatization catalysts).

[37] *See, e.g.*, J.F. Barker et al., *The Fate and Persistence of Aromatic Hydrocarbons Dissolved in Groundwater: Results from Controlled Field Experiments*, ENVIRONMENTAL CONCERNS IN THE PETROLEUM INDUSTRY 15-30 (1989) ("The contaminants of particular concern are the common, water soluble and mobile aromatic hydrocarbons: benzene, toluene, ethylbenzene, and xylene isomers, as a group termed BTEX."); *see also*, W. Robert Schwandt, *Non-Traditional Products from Corn*, INCREASING UNDERSTANDING OF PUBLIC PROBLEMS AND POLICIES 127-132, 131 (1981) (discussing hydroforming operations at petroleum refineries having a significant loss in yield of about 20 percent); *see also*, Roger M. Westerholm et al., *Effect of Fuel Polycyclic Aromatic Hydrocarbon Content on the Emissions of Polycyclic Aromatic Hydrocarbons and Other Mutagenic Substances from a Gasoline-Fueled Automobile*, 22 ENVIRON. SCI. TECHNOL. 925-930 (1988) (concluding increase in fuel aromaticity increased polycyclic aromatic hydrocarbon outputs with significant mutagenic effects).

[38] David S. Hirshfeld and Jeffrey A. Kolb, *Refining Economics of U.S. Gasoline: Octane Ratings and Ethanol Content*, 48 ENVTL. SCI. & TECH. 11064-11071 (2014).

[39] Anchorage Air Quality Program, *Assessment of the Effectiveness of New Mobile Source Air Toxics Regulations in Reducing Ambient Concentrations of Benzene and Other Air Toxics in Anchorage, Alaska*, COMMUNITY AIR TOXICS STUDY – INTERIM (PHASE 1) REPORT (Dec. 2010).

[40] Yixing Du et al., *Air particulate matter and cardiovascular disease: the epidemiological, biomedical and clinical evidence*, 8 J. THORAC. DIS. 8-19 (2016) ("Based on numerous epidemiological studies and large

motor vehicle engines produces emissions of black carbon, one of the most powerful agents of climate change.[41] The 1990 CAAA mandate constitutes a legislative "finding of harm"—that EPA must reduce MSATs caused by gasoline aromatics to the greatest achievable degree as technologies present themselves.[42]

If current trends continue by 2020 mobile source carbonaceous material will be responsible for a significant percentage of $PM_{2.5}$ emissions.[43] Compounding this concern is the fact that EPA only regulates particle mass, and not particle numbers (PN). In doing so, EPA overlooks UFPs, which are particularly dangerous because they are coated with highly-toxic polycyclic aromatic hydrocarbon quinones (PAHQs) that penetrate the lungs and are carried by the bloodstream to the organs, where they cause a wide range of cancers, heart disease, asthma, and even DNA and mitochondrial cell damage.[44] PAHQs themselves are combustion byproducts and oxidative derivatives of gasoline and specifically aromatic/BTEX components.[45] Since they are emitted primarily by gasoline-powered vehicles, UFPs + PAHQs are found in their most elevated levels near congested roadways and urban areas, where tens of millions of Americans have no alternative but to breathe the poisonous air. Unlike cigarette smoke, these toxic emissions are invisible, but their economic costs are enormous, and the human costs are unquantifiable.

EPA has known gasoline aromatics are a predominant source of highly-toxic secondary organic aerosol (SOA)-bound PAHs.[46] Furthermore, PAHs formed in the

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clinical observation, the PM2.5 has been considered as the main culprit of the adverse cardiovascular effects of air pollution on human health.")

[41] P. Winiger et al., *Source apportionment of circum-arctic atmospheric black carbon from isotopes and modeling*, 5 SCIENCE ADVANCES 2 (2019) (finding that fossil fuel combustion is the main contributor to black carbon collected at five sites around the Arctic).

[42] Stanfeld, S., *The Mobile Source Air Toxics Rule: How Does the Greatest Reduction Become No Reduction?* Ecology Law Quarterly, Vol. 31, Issue 3 (June 2004).

[43] US EPA Technical Support Document: Estimating the Benefit per Ton of Reducing $PM_{2.5}$ Precursors from 17 Sectors (Jan 2013). Available at: https://www.epa.gov/sites/production/files/2014-10/documents/sourceapportionmentbpttsd.pdf; *Integrated Science Assessment for Particulate Matter (Final Report)*, EPA-600-R-08-139F.National Center for Environmental Assessment – RTP Division. Research Triangle Park, NC. Available at: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=216546.

[44] Marianne Geiser et al., Ultrafine Particles Cross Cellular Membranes by Nonphagcytic Mechanisms in Lungs and in Cultured Cells, 113 ENVIRON. HEALTH PERSPECT. 1555-1560 (2005).

[45] D. Gurbani et al., *Polycyclic aromatic hydrocarbons and their quinones modulate the metabolic profile and induce DNA damage in human alveolar and bronchiolar cells*, 216 INT. J. HYG. ENVIRON. HEALTH 553-65 (2013).

[46] US EPA Technical Support Document: Estimating the Benefit per Ton of Reducing $PM_{2.5}$ Precursors from 17 Sectors (Jan 2013). Available at: https://www.epa.gov/sites/production/files/2014-10/documents/sourceapportionmentbpttsd.pdf; *Integrated Science Assessment for Particulate Matter (Final Report)*, EPA-600-R-08-139F.National Center for Environmental Assessment – RTP Division. Research Triangle Park, NC. Available at: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=216546.

presence of SOAs have a synergetic effect in which PN (particle number) concentrations are amplified by a factor of 100 or greater, and the particles are insulated and preserved, enabling long-range transport.[47]

EPA's historic reasoning for not regulating $PM_{2.5}$, SOAs and UFPs caused by gasoline exhaust is "modeling uncertainties."[48] However, it is also clear that the uncertainties do not arise from whether aromatics/BTEX contributes to PM, toxics and ozone, but simply to what degree.[49] EPA has confirmed that aromatics/BTEX is solely responsible for the organic aerosol formation potential of gasoline, and that aromatic compounds are responsible for 50–70% of the aerosols in many air sheds.[50] A 2007 southern California study found that up to 80% of the ambient ultra-fine particulate emissions were secondary organic precursors from gasoline exhaust and vapors.[51]

Additionally, unless gasoline aromatics levels are reduced, advanced engine designs such as direct injection will make UFP emissions worse, according to groups like the Health Effects Institute (HEI) and California Air Resources Board (CARB).[52] This concern has been echoed by numerous other subject matter experts, including automotive engineers and elite medical universities. For example, a 2010 Honda SAE paper identified Aromatics Group compounds as the primary source of PN/PAH emissions, and warned that the necessary reductions cannot be achieved without combining fuel quality improvements with advanced engine technologies.[53]

Before it can control or prohibit a fuel or fuel additive under 211(c), EPA must publish a finding that "such prohibition will not cause the use of any other fuel or fuel additive which will produce emissions which will endanger the public health or welfare to

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[47] Alla Zelenyuk et al., *The effect of gas-phase polycyclic aromatic hydrocarbons on the formation and properties of biogenic secondary organic aerosol particles*, 200 FARADAY DISCUSSIONS 143-164 (2017).

[48] Stephen D. Page, Director U.S. Environmental Protection Agency, *Guidance for PM2.5 Permit Modeling* 30 (2014) ("In addition, there may be additional uncertainty associated with deposition modeling for PM2.5 due to the fact that deposition properties may vary depending on the constituent elements of PM2.5. Therefore, use of deposition algorithms to account for depletion in estimating ambient PM2.5 concentrations should be done with caution and only when clear documentation and justification of the deposition parameters is provided.")

[49] Clean Air Fine Particle Implementation Rule, *Policy for VOC*, 72 Fed. Reg. 79, 20592-93 (2007).

[50] Proposed Rule To Implement the Fine Particle National Ambient Air Quality Standards, 70 Fed. Reg. at 65996 ("The experimental work of Odum and others showed that the secondary organic aerosol formation potential of gasoline could be accounted for solely in terms of its aromatic fraction.")

[51] Brown et al., *Source apportionment of VOCs in the Los Angeles area using positive matrix factorization*, 41 ATMOSPHERIC ENVIRONMENT 227-237 (2007).

[52] California Air Resources Board, *Preliminary Discussion Paper-Amendments to California's Low-Emission Vehicle Regulations for Criteria Pollutants-Lev. III*, p. 10 (2010).

[53] K. Aikawa et al., *Development of a Predictive Model for Gasoline Vehicle Particulate Matter Emissions*, 3 SAE INT. J. FUELS LUBR. 610-622 (2010).

the same or greater degree than the use of the fuel or additive proposed to be prohibited."[54] The proposed rule, by prohibiting the use of higher ethanol blends as octane substitutes for highly toxic gasoline aromatics, flagrantly violates this requirement. Prohibiting the use of higher ethanol blends such as E30 will cause the continued or expanded use of aromatics which Congress has directed EPA to reduce to the greatest achievable degree in section 202(l). On this point, we commend the Agency to consider Ambassador C. Boyden Gray, former White House Counsel to President George H.W. Bush, comments to EPA's original GHG rule:

> *"If EPA is going to rely on the CAAA to reduce mobile CO_2, it cannot ignore the same statute's requirements to reduce mobile source air toxics, especially if that reduction also reduces CO_2. . . EPA cannot under the CAA cause an increase of one form of regulated pollution that causes serious health problems by reducing another that does not."*[55]

In sum, EPA's failure to address the significantly greater impacts from continued use of aromatics, as mandated by Congress, despite ample and undisputed evidence of the significant harm they cause, which fall disproportionately on vulnerable and disadvantaged populations, cannot be ignored and must inform EPA's interpretations.

6. Mid-level ethanol blends will result in greater reductions in harmful pollutants and improved engine performance.

No other additive or method for enhancing gasoline octane ratings can come close to providing the myriad societal and national policy benefits that E30 ethanol's superior octane properties bring to the nation.

EPA does not dispute that during the expansion of E10 blending between 2007 and 2012, "aromatics levels were observed to decline by a few volume percent while pump octane levels stayed constant."[56] While the move to year-round E15 may have modest impacts on aromatic levels, a much greater and more meaningful decline in aromatics and the harmful emissions they cause would be expected to occur with E30.

E30 would also increase gasoline octane levels from today's 87 AKI to 94 AKI (100 RON), with commensurate increases in vehicle performance, drivability and increased power.[57] EPA is well aware of the benefits of higher octane gasoline.[58] On

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[54] 42 USC Section 7545(c)(2)(C).

[55] Comments of Boyden Gray & Associates PLLC to the NHTSA-2010-0131 and EPA-HQ-OAR2010-0799 Proposed Rule, 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, at p. 7 (Feb. 2012).

[56] 84 Fed. Reg. at 10604.

[57] *See* Glacial Lakes Energy report, "Fuel Economy and Power Generation of 30% Ethanol (E30) Splash Blended Fuel in Fuel injected Non-FFV Gasoline Engines," (Jan. 19, 2017), attached as Addendum to Commenters' prior comments to REGS Rule, and incorporated herein by reference; *see also* Thom G. Leone et al., *The Effect of Compression Ratio, Fuel Octane Rating, and Ethanol Content on Spark-*

September 10, 2015, Department of Energy Assistant Secretary for Transportation Rueben Sarkar singled out E25 – E40 blends as top priorities for the Department in its 2015 Quadrennial Technology Review.

> *Currently, the only renewable high-octane fuel available at large scale is ethanol, which makes up 10% of gasoline sold by volume. Increasing this percentage of ethanol can dramatically increase the octane rating of the finished gasoline/ethanol fuel blend, with most of the benefit being around 25 – 40% ethanol by volume."* [59]

In May 2016, the Des Moines Register quoted DOE Secretary Moniz as saying that his Department's research showed that E30 blends were "optimal" for improving fuel efficiency and reducing carbon emissions.[60] The Secretary's comments complemented recent US Energy Information Administration's projections that by 2025, 83.3 percent of U.S. vehicles will be turbo-charged.[61] EIA noted that "As automakers produce more vehicles with turbocharged engines, it is likely they will recommend or require more LDVs to use higher-octane gasoline."[62]

Adopting a rule that does not restrict cleaner burning, performance-enhancing, cost-competitive mid-level ethanol blends like E30 would also complement the transition to hybrid electric vehicles and help meet EPA's petroleum efficiency and GHG

Ignition Engine Efficiency, 49 ENVIRON. SCI. TECH. 10785 (2015) (101-RON E30 fuel with downsizing yields a total efficiency gain of 7% and a reduction in tailpipe CO2 emissions of 7%, compared to 4.0% and 4.1% respectively for a 96 RON E20 fuel.); *see also* David S. Hirshfeld and Jeffrey A. Kolb, *Refining Economics of U.S. Gasoline: Octane Ratings and Ethanol Content*, 48 ENVTL. SCI. & TECH. 11064-11071 (2014).

[58] *See Safer Affordable Fuel-Efficient (SAFE) Vehicle Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*, Notice of Proposed Rulemaking, Department of Transportation and Environmental Protection Agency, at p. 129 ("In anticipation of this proposed rulemaking, organizations such as the High Octane Low Carbon Alliance (HOLC) . . . have shared their positions on the potential for making higher octane fuels available for the U.S. market. . . . In the meetings with HOLC . . . the groups advocated for the potential benefits high octane fuels could provide via the blending of non-petroleum feedstocks to increase octane levels available at the pump. The groups' positions on benefits took both a technical approach by suggesting an octane level of 100 RON is desired for the marketplace, as well as, the benefits from potential increased national energy security by reduced dependencies on foreign petroleum.")

[59] US DOE Quadrennial Technology Review - Chapter 8: Advancing Clean Transportation and Vehicle Systems and Technologies, at p. 285 (September 2015) Available at: https://www.energy.gov/quadrennial-technology-review-2015

[60] https://www.desmoinesregister.com/story/money/2016/05/06/energy-secretary-us-must-energy-independent/84022038/

[61] Available at: https://www.eia.gov/todayinenergy/detail.php?id=25692

[62] *Id.*

objectives. Oak Ridge and other experts have emphasized the compatibility of higher compression E30 with electric vehicle technologies as they gradually come to market.

> Thus, if engine efficiency can be increased through compression ratio enabled by fuel AKI increase, hybrid powertrains can leverage and compound engine efficiency increases to even further improve fuel economy. This ability illustrates that hybrid powertrains are complementary to high efficiency or advanced combustion concepts.[63]

E30's superior octane properties would also allow refineries to turn down or idle their energy intensive reformers, which would reduce refinery CO_2 emissions by 10%, and crude oil use by 8%. Splash blending an additional 20% of ethanol on top of E10 (to produce E30 100+ RON) would displace another 20%, for a total crude oil/gasoline displacement effect of 38%. Thus, consumers would save billions of dollars at the pump, and crude oil demand would be substantially reduced.

7. EPA relies on discredited models and studies

To the extent EPA relies on historical studies and models, including the MOVES2014 model and EPAct/V2/E-89 fuel effects study (EPAct Study), to support its assumptions and conclusions regarding the impacts of ethanol relative to other fuel components, such reliance is not reasonable or rational given the documented problems and deficiencies with that evidence.

Substantial evidence, including admissions from EPA's own officials, confirms that the MOVES Model is ineffective and incapable of accurately predicting the most dangerous urban emissions, namely SOA-bound PAHs. EPA has acknowledged that its models seriously understate, and in some cases ignore, the contributions gasoline/aromatics/BTEX makes to $PM_{2.5}$.[64] EPA also said it would account for secondary organic PM from "gaseous toluene emissions" in future models.[65] EPA also promised in its original 2011 CAFE-GHG rulemaking that it would correct its models, but has failed to do so.

The EPAct Study's misguided analysis of the emissions effects of five fuel parameters (ethanol content, aromatics content, Reid Vapor Pressure (RVP), T50, and T90), based on test fuels including straight gasoline (E0) and blends of gasoline with 10%, 15%, and 20% ethanol (E10, E15, and E20), was conducted with the assistance

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[63] *Id.* at p. 16.

[64] *See* U.S. Environmental Protection Agency/Office of Air and Radiation, *The Benefits and Costs of the Clean Air Act from 1990 to 2020, Final Report – Rev. A*, pp. 4-24-27, 5-13 (April 2011).

[65] 72 Fed. Reg. at 23978 (2007) ("EPA is currently developing a model of secondary organic PM from gaseous toluene emissions. We plan to incorporate this mechanism into the CMAQ model in 2007. The impact of other aromatic compounds will be added as further research clarifies their role in secondary organic PM formation.")

of Southwest Research Institute (SwRI) and the Coordinating Research Council (CRC), a non-profit organization supported by the American Petroleum Institute.

Instead of testing the emissions effects of mid-level ethanol blends by simply adding ethanol to commercial gasoline blendstocks ("splash blending"), the EPAct Study's designers created novel fuels through a "match blending" process in which they first adjusted the gasoline blendstock to hold constant selected parameters, including T50 and T90—the "distillation temperatures" at which 50% and 90% of the contents of the fuel are vaporized.[66] In order to match the T50 and T90 of fuels with varying ethanol concentrations, high distillate aromatic and saturated hydrocarbons were added to fuels with higher ethanol content to counteract ethanol's beneficial effect of lowering T50 and T90. The resulting test fuels deviated significantly from fuels available in the market—with some fuels exceeding legal limits on driveability and others containing unrealistically high octane ratings.

The EPAct Study's conclusion that "other factors being equal, increasing ethanol is associated with an increase in emissions," is misleading. In the real world, selected parameters are not held constant to create gasoline blendstocks.[67] Even when the other four fuel parameters (aromatics, T50, T90, and RVP) are accounted for, it is impossible to derive accurate results from the EPAct Study. Ethanol has a non-linear effect on gasoline distillation, so raising the T50 of higher ethanol blends to match the T50 of E0 and E10 blends results in elevated T60-80 distillation temperatures. High upper distillation temperatures impede complete combustion, producing pollution, and when more heat is required to vaporize fuel components, more emissions result. Moreover, the high-distillate hydrocarbons used to raise T50 and T90 have the greatest effect on emissions, but the EPAct study treats all aromatics equally.

In recognition of EPA's reliance on members of the oil industry to advise and assist with designing the EPAct Study, numerous peer-reviewed studies have been published in support of the benefits of increasing ethanol content in high octane fuel. These studies highlight the environmental benefits of midlevel octane blends, particularly with respect to life-cycle greenhouse gas emissions. This includes the 2017 report commissioned by the USDA, which found that "a large body of information has become available since 2010—including new data, scientific studies, industry trends, technical reports, and updated emission coefficients—that indicates that . . . actual emissions . . . differ significantly from those projected" by EPA's 2010 lifecycle

[66] *See* Request for Correction of Information submitted on behalf of The State of Kansas, The State of Nebraska, The Energy Future Coalition, and Urban Air Initiative Concerning the U.S. Environmental Protection Agency's EPAct/V2/E-89 Fuel Effects Study and Motor Vehicle Emissions Simulator Model (MOVES2014), Docket ID Nos. EPA-420-R-13-002, FRL-9917-26-OAR (Jan. 19, 2017).

[67] *See* Anderson et al., *Issues with T50 and T90 as Match Criteria for Ethanol-Gasoline Blends*, SAE 2014-01-9080, at 1034 (2014) ("[O]ther factors are not equal when ethanol is added to gasoline. Depending on the blendstock, the added ethanol reduces T50 due to near-azeotropic behavior and reduces T90 and aromatics content by dilution. Considered as a whole, these factors tend to reduce emissions with increasing ethanol.").

analysis.[68] The report specifically showed that whereas EPA's 2010 lifecycle analysis estimated that corn ethanol would only be 21 percent less carbon-intensive than gasoline in 2022, up-to-date analysis shows that corn ethanol is actually 43 percent cleaner today, and that corn ethanol's advantage will grow to 48 percent by 2022.

Current data utilizing updated methods simulating real-world conditions further dispels erroneous findings that emissions associated with corn ethanol production and combustion exceed the emissions associated with producing and combusting an energy-equivalent quantity of gasoline.[69]

The time has long since passed for EPA to stop relying on test models effectively developed by the oil industry without submission to the Science Advisory Board. EPA must correct its models to comply with the Agency's Information Quality Guidelines.

8. EPA ignores evidence that ethanol does not impair emission control devices

The Proposed Rule states that it "would not change the basis of our CAA sec. 211(c)(1)(A) and (B) finding in the MMR that prohibits E15 from use in MY2000 and older LDV," which is based on assessment that E15 "would significantly impair the emission control systems" used in such vehicles. FR at 10593 (citing 76 FR 44422 (July 25, 2011). This is another example of EPA continuing to promote and act on false narratives about ethanol, which it would not be able to prove under 211(c).

E30 does not impair emissions control systems. Additionally, to use or introduce E30 into a non-flex fuel vehicle does not require a retrofit, conversion, or alternative conversion system, such as those contemplated by the anti-tampering provision, Memorandum 1A, and the applicable addendums and revisions. Therefore, using or introducing E30 in a non-flex fuel vehicle does not constitute "the use of an incorrect fuel . . . that renders the emission control system inoperative."[70]

These understandings are supported by real world data and experience.

In the 2012 NREL/U.S. Department of Energy "Aging" Studies (cited previously), the National Renewable Energy Labs (NREL) tested legacy vehicles on blends of 15 to 20 percent ethanol in certification gasoline. The vehicles were subjected to conditions simulating 120,000 miles of operation. The study found that E20 blends were in most cases better than E0 blends with regard to emissions (including NOx emissions) and

[68] ICF, A Life-Cycle Analysis of the Greenhouse Gas Emissions of Corn-Based Ethanol, pp. 4, 166 (Jan. 12, 2017).

[69] Jan Lewandrowski et al., *The greenhouse gas benefits of corn ethanol – assessing recent evidence*, BIOFUELS (2019), *available at* https://doi.org/10.1080/17597269.2018.1546488.

[70] 40 C.F.R. § 1068.101(b)(1).

equipment deterioration, including the TWC.[71] For four of the six models tested, the vehicle aged on RE0 (gasoline containing no ethanol) fuel had higher exhaust emissions compared to the matched vehicles aged on RE15 or RE20 fuel. This finding contradicted the concern that higher ethanol content in gasoline may accelerate catalyst deterioration.

A second 2012 Oak Ridge/NREL E20 TWC/Emissions Control Study of mid-level ethanol blends, cited in the NREL "Aging" study, reported on DOE's multi-year catalyst durability study, which investigated effects of adding up to 20% ethanol on vehicle emissions control systems in 86 vehicles. The results were positive for the use of EXX blends in legacy vehicles. The 3-page Executive Summary identifies the E10 Blend Wall challenge, limitations on FFV availability, and the lack of market acceptance of E85 as the primary reasons that DOE chose to conduct the study. RE0 (E0 gasoline) was splash-blended with 10, 15, and 20 percent ethanol to produce the blends. The report confirms that the EXX blends performed well, and did ***not*** degrade the emissions control systems compared to E0 blends, even after extensive "aging."

Additionally, as noted in Commenters' previous comments to the REGS Rule, more than two years ago, Glacial Lakes Energy, LLC began an "E30 Challenge", which challenges individuals to try E30.[72] According to Glacial Lakes Energy, LLC, E30/94 AKI has many benefits, including that, "E30 reduces harmful cancer causing carcinogens contained in gasoline."[73] Glacial Lakes Energy claims that those who have taken the E30 challenge reported better performance in their vehicles, including in the use of non-flex fuel vehicles.[74]

As part of the E30 Challenge, Glacial Lakes Energy partnered with Dyno Tune Speed and Performance to conduct a study regarding the fuel economy and power generation of the use of E30/94 AKI in non-flex fuel gasoline vehicles.[75] The study was conducted in two parts – 1) dynamometer testing; and 2) collection of real world on-road

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[71] Specific NREL Study findings with respect to emissions included: (1) The vehicles aged on 15% and 20% ethanol-containing fuels did not produce higher exhaust emissions compared to control vehicles aged on ethanol-free fuel, for all six models tested in the study; (2) Blends of 15% to 20% ethanol into certification gasoline either produced no change or lowered NMHC and CO emissions for each vehicle tested, relative to the same vehicle tested on ethanol-free certification gasoline, and (2) NOx emissions were not statistically different for each vehicle tested on ethanol-containing certification fuels, compared to the same vehicle tested on ethanol-free certification gasoline.

[72] *See* http://www.glaciallakesenergy.com/events/2016_E30_Challenge_Brochure.pdf.

[73] *Id.*

[74] http://www.glaciallakesenergy.com/events_2016_E30.htm.

[75] Brad Brunner, Glacial Lakes Energy, and Andy Wicks, Dyno Tune Speed and Performance, *Fuel Economy and Power Generation of 30% Ethanol (E30) Splash Blended Fuel in Fuel Injected Non-FFV Gasoline Engines* (Jan. 19, 2017). Available at http://www.sdfu.org/assets/docs/uploads/gle-e30-challenge-white-paper-1-19-17final.pdf;

data of non-flex fuel vehicles use of E30/94 AKI.[76] After surveying local dealerships and independent automobile repair shops in the Watertown, South Dakota area, an area that has had ethanol blender pumps at retail locations for several years, it was determined that no known issues have been reported as associated with the use of higher blend ethanol, including E30/94 AKI, in non-flex fuel vehicles.[77] The test results demonstrated that the use of E30/94 AKI provided "better vehicle performance, drivability and increased power."[78]

The study tested three different non-flex fuel vehicles, each with varying mileage.[79] Test results confirmed that no malfunctions were reported in any of the vehicles after using E30 and demonstrated the benefits of utilizing E30 in non-flex fuel vehicles.[80] In sum, the study concluded,

- In all cases, non-FFVs tested on a dynamometer using splash blended E30 fuel provided greater horse power and torque based on data collected from idle to wide open throttle.

- Use of E30 in vehicles not labeled as FFVs reduced knock retard by 60% when compared directly to E10 in a six tank trial over 40 vehicles spanning in excess of 80,000 miles.

- Due to a reduction in knock retard, average mpg on the fleet of participants was not compromised. There was a gain in mpg on four cylinder vehicles using splash blended E30 vs E10. This is not consistent with responses previously reported in EPA certified lab testing using only certified fuels versus commercially available real world fuels.

- Service vehicles were found to gain .4 mpg or 5.5 percent increase in [miles per gallon] over 107,000 miles traveled on over 14,000 gallons of fuel.

- Retailers demonstrated a gain in market share and improved net revenue through an educational process that was industry driven and community supported.

- Significant potential exists for new vehicles to be designed to more effectively use 94 octane E30 creating combustion efficiencies by increasing piston compression ratios from present levels of 9.5:1 to levels approaching 14:1. This increase can be leveraged to

[76] *Id.*
[77] *Id.*
[78] *Id.*
[79] *Id.*
[80] *Id.*

manufacture smaller, lighter, more efficient engines that are capable of delivering more power with less fuel.[81]

Finally, EPA recently approved a program in Nebraska in which the State will run state-owned vehicles on a 30 percent ethanol blend to establish how the fuel performs in conventional engines and vehicles. The pilot program will monitor the effects of E-15 and E-30 blends on vehicle performance, fuel economy and emissions control systems in state vehicles, including Nebraska State Patrol cruisers.

9. EPA's claim of insufficient data is an abdication of its responsibility to regulate to maximum achievable standard

EPA exists to establish and enforce environmental protection standards and to conduct research on the effects of pollution. Many of the mandates enacted by Congress under the CAA recognize these dual and related roles. With respect to ethanol specifically, Section 211 of the CAA (42 U.S.C. §7545), required EPA, as a predicate to regulation, to study the effects on public health, air quality and water resources of the increased use of ethanol as a substitute for MTBE in gasoline.[82] The same section further authorizes EPA to enter into contracts with other governmental and nongovernmental entities, including the national energy laboratories and institutions of higher education, to carry out this mandate.

With a mandate to conduct research also comes the duty to stay informed of changes and advancements in areas it has been charged with studying. In the proposed rulemaking, EPA acknowledges its responsibility to consider the wisdom of its policy "on a continuing basis" and respond to "changed factual circumstances."[83] EPA officials recently affirmed their understanding that Section 202(l) requires EPA to continue looking for opportunities to further reduce air toxics from motor vehicle and motor vehicle fuels.[84]

Yet, when it comes to ethanol, EPA has shown, time and again, a preference for imposing and maintaining burdensome and restrictive regulations based on conservative and outdated assumptions, over advancing knowledge and understanding of the true effects of ethanol content on emissions and the environment.

We see this in the original justifications used by EPA to avoid giving effect to the CAA mandate to replace harmful aromatics with clean octane from ethanol, which

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[81] *Id.*

[82] One notable exception to this approach is the MSAT provisions of CAA section 202, which does not authorize studies of possible harm as a predicate to action, but includes a legislative finding of harm and command to eliminate air toxics to the extent technology permits with due consideration of cost factors.

[83] 84 Fed. Reg. at 10,591.

[84] *See* March 15, 2018 Letter from C. Grundler to D. Sombke, South Dakota Farmers Union.

centered on the alleged lack of knowledge regarding the availability of ethanol and misplaced concerns regarding cost. When that narrative lost traction – and EPA had to concede that ethanol is both sufficiently available and cost effective – EPA sought to restrict the availability of ethanol in other ways based on concerns or uncertainty regarding ethanol's alleged role in other impacts or harms.

We also see it in EPA's approach to mobile source air toxics. EPA last updated its analysis of maximum available technology in its 2007 Mobile Source Air Toxics (MSAT) final rule. Many believe that the information and assumptions behind this rule are outdated and no longer valid. Under Section 202(l), EPA is statutorily obligated to update its obsolete cost-benefit analysis – a responsibility EPA has acknowledged. Yet EPA refuses to so, and continues to use the studies.

We see it in EPA's Second Triennial Report to Congress on Biofuels and the Environment last year,[85] where EPA was content to report that "[t]here is no new evidence that contradicts the conclusions of the [2011 Triennial Report] concerning air quality," despite ample evidence to the contrary.[86] With respect to mid-level ethanol blends, the Triennial Report similarly obfuscates, stating "potential air quality improvements from broad adoption of [mid-level ethanol blend] technologies has not been seen or studied."[87] What this description leaves out is the fact that by limiting certification and testing of new vehicles to fuels that are commercially available throughout the country, EPA effectively prohibits such testing.

EPA's disparate treatment of ethanol compared to conventional fuels is evident in its interpretations of the substantially similar provision, where EPA's historical interpretations and allowances in regard to oxygen content have consistently lagged even its own recognition of what the accepted science shows regarding the lack of harmful effects or impacts from increased ethanol content in gasoline.[88]

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[85] USEPA, Office of Research and Development, Second Triennial Report to Congress on Biofuels and the Environment, at 64 (June 29, 2018).

[86] *See, e.g.*, ICF, *A Life-Cycle Analysis of the Greenhouse Gas Emissions of Corn-Based Ethanol*, pp. 4, 166 (Jan. 12, 2017) (USEPA's 2010 lifecycle analysis estimated that corn ethanol would only be 21 percent less carbon-intensive than gasoline in 2022; up-to-date analysis shows that corn ethanol is actually 43 percent cleaner today, and that corn ethanol's advantage will grow to 48 percent by 2022.)

[87] *Id*. at 61.

[88] For instance, in the proposed rulemaking, EPA acknowledges that in 1991 the allowance for oxygen content in its sub sim rule was changed to 2.7 weight percent for gasoline containing aliphatic alcohols – which equates to approximately 7.7 volume percent ethanol – "based on data and EPA's experience with 211(f)(4) waiver data," even though at the time EPA had already granted a waiver for E10. Even after it granted subsequent waivers for E15 in 2010 and 2011, EPA's sub sim oxygen content allowance remained at 2.7 weight percent for aliphatic alcohols (including ethanol). Meanwhile, the sub sim interpretation placed no allowances or limits on total aromatic compounds in gasoline, despite a clear legislative finding of harm with respect to such compounds.

The current proposed rule continues this practice of relying on dated information and prior findings, and falling back on the alleged need more information and study as the basis for avoiding further meaningful action to advance ethanol.

- The proposed rule includes repeated references to data and findings from the 2010 211(f)(4) partial waiver for E15, as the basis for its finding that E15 is sub sim to E10.[89] While the proposed rulemaking also cites to more recent studies – from 2017 and 2018, respectively – those studies basically confirm what was known to EPA in 2010 regarding the benefits of E15.

- The proposed rule similarly relies on findings from the 2011 Misfueling Mitigation Rule (MMR) to support for a continuing assessment that E15 "would significantly impair the emission control systems" used in MY 2001 or earlier vehicles,[90] despite more recent evidence to the contrary.

- We also see repeated references to a lack of information regarding emissions, materials compatibility and performance for ethanol blends beyond E15.[91] At one point, the rule even suggests that additional information is needed regarding "the potential effects on the exhaust emissions of E15 . . . in Tier 3 certified vehicles *given the limited data currently available*."

- Similarly, the proposed rulemaking makes repeated references to the technical data supporting the original 1-psi waiver for gasoline blended with 9-10 percent ethanol, but fails to mention additional data showing the consistent decline in RVP with each step up in ethanol content above E15.

Even as it proposes to remove certain obsolete regulatory limitations on E15, the Proposed Rule seeks comment on imposing new additional limitations, including limiting its sub sim interpretation for E15 to vehicles and engines certified using Tier 3 E10 certification fuel and the need for additional misfueling measures for E15, demonstrating

[89] 84 Fed. Reg. at 10,598 (relying on 2010 waiver data with respect to exhaust emissions); at 10600 (relying on 2010 waiver data with respect to materials compatibility); at 10601 ("We reviewed the data and information from the over 30 different test programs evaluated to grant the E15 partial waivers and we found ''no specific reports of driveability, operability or onboard diagnostics (OBD) issues across many different vehicles and duty cycles including lab testing and in-use operation.'')

[90] 84 Fed. Reg. at 10,593 (citing 76 FR 44422 (July 25, 2011)); *see also Id.* at 10,602 ("The record has not changed with respect to the inability of older vehicles, nonroad equipment, motorcycles, or heavy-duty trucks to use E15, which formed the basis of our denial of the E15 waiver request for such vehicles, engines, and equipment.")

[91] *Id*. at 10601, n.126 ("Our proposed interpretation is limited to gasoline that contains only ethanol content up to 15 percent as this is the only oxygenate that we have sufficient data and information to support at this time.")

EPA's unwillingness to afford ethanol the same treatment accorded other sub sim certification fuels.

The Proposed Rule is thus illustrative of the catch-22 embodied in the current regulatory regime, which identifies (in many cases incorrectly) areas where further testing and studies or changes to vehicle design are necessary while at the same time preventing or limiting the ability or incentive for manufacturers to perform such testing and development.

The above examples, while not exhaustive, demonstrate how EPA has failed in its mandate to review and update the information, research and models upon which its past decisions and regulations are based.[92] Through excessive consideration of cost, continued deferral of rulemaking, and a perpetual search for more information, EPA has failed to ensure that emissions be reduced through technological innovation as the CAA directs.[93]

10. Stopping at E15 will continue to undermine RFS program

The Energy Independence and Security Act (EISA) requires EPA to set yearly renewable fuel volume requirements by category. EPA updates the volume requirements each year based on fuel availability. Despite the wide availability and cost effectiveness of corn ethanol, EPA consistently requests and obtains waivers from the mandated total renewable fuel standards under EISA due to the failure of other renewable fuel types (cellulosic ethanol, in particular) to meet production and cost expectations.[94] This consistent failure to meet Congressional targets for renewable fuels in the face of excess ethanol capacity cannot continue.

Corn ethanol is the most viable and cost effective option for meeting RFS volume requirements. Opening the door to broader use of corn ethanol is the only currently available and achievable way to reverse this history of RFS mismanagement and underperformance. While the move to year-round E15 will have some modest impact, the final rule should not rule out the use of mid-level blends above E15 to close the renewable fuel volume gap.

[92] 42 U.S.C. § 7403.

[93] Stanfeld, S., *The Mobile Source Air Toxics Rule: How Does the Greatest Reduction Become No Reduction?* Ecology Law Quarterly, Vol. 31, Issue 3 (June 2004).

[94] Forbes, *Cellulosic Ethanol Falling Far Short Of The Hype* (Feb. 18, 2018).