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September 27, 2021

Joseph Goffman
Acting Assistant Administrator, Office of Air and Radiation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460
Submitted via: www.regulations.gov
Docket ID No. EPA-HQ-OAR-2021-0208

RE: Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emission Standards

Dear Acting Assistant Administrator Goffman:

Growth Energy is the world's largest association of biofuel producers representing 92 biorefineries that produce nearly 9 billion gallons annually of low-carbon renewable fuel and 91 businesses associated with the biofuel production process. Together, we remain committed to helping our country diversify its energy portfolio to create more clean energy jobs, further decarbonize our nation's energy mix, sustain family farms, and drive down the costs of transportation fuel for consumers.

We appreciate EPA's work to reshape the nation's transportation mix to make it more sustainable – this is a central driver for our industry as well. Vehicles and fuels operate as a system and liquid fuels will continue to play a dominant role in the transportation sector for decades to come, even as alternative technologies flourish. As such, it is imperative to consider the vital role that environmentally sustainable fuel options such as ethanol will play in further reducing greenhouse gas emissions from the current and future vehicle fleet. It is also imperative to consider the full lifecycle emissions of all vehicle and fuel technologies to accurately evaluate the profiles and benefits of vehicles using different fuels and energy sources.

Ethanol is the most available and affordable means to immediately clean up our liquid fuel supply. Recent data from Environment Health and Engineering show today's corn ethanol reduces greenhouse gas emissions by an average of 46% compared to gasoline and can provide reductions of up to 70% with the use of readily available technologies.[1] Ethanol's other

[1] Scully et al, *Carbon intensity of corn ethanol in the United States: state of the Science* (2021, Environ. Res. Lett), finding corn ethanol reduces GHGs 46% versus gasoline, available at https://iopscience.iop.org/article/10.1088/1748-

environmental benefits are also noteworthy. As has been researched, the use of more ethanol and ethanol-blended fuel reduces air toxics such as carbon monoxide, benzene, and other harmful particulates.[2]

With a stable policy and access to drivers, our industry can deliver low-carbon, low-cost, high-performing, sustainable vehicle fuel solutions that reduce greenhouse gas emissions now and well into the future.

EPA must recognize the full lifecycle net greenhouse gas emission reduction benefits of vehicles that use ethanol and other low-carbon fuel alternatives to gasoline.

The proposal overlooks ethanol's benefits as a key means to reduce greenhouse gas emissions. Notably, the notice of proposed rulemaking (NPRM) doesn't contain any discussion of ethanol, other than passing reference (without discussion) such as to "Ethanol-E85" in a table. The NPRM's failure to fully evaluate the greenhouse gas emissions reduction benefits of ethanol use in vehicles is a critical error, and undermines the rule's analytical foundation, for two reasons. First, ethanol fuels the vast majority of vehicles addressed by the rule, which have internal combustion engines (ICE) that run on at least 10% ethanol.[3] In fact, more than 95% of vehicles on the road today can run on up to 15% ethanol.[4] Second, the entire purpose of this rulemaking is to reduce greenhouse gas emissions, yet this rulemaking overlooks the key role of ethanol in reducing vehicle greenhouse gas emissions. Ethanol can reduce vehicle greenhouse gas emissions on average 46% compared to gasoline with further reductions using readily available technologies.[5]

The proposal ignores ethanol as a key greenhouse gas emissions reduction strategy for the vast majority of the vehicle fleet. The NPRM concedes that over 92% of new light-duty vehicles will continue to use internal combustion engines through model year 2026. Specifically, EPA finds that electric vehicles (EV) and plug-in hybrid electric vehicles (PHEV) represent only 2% of the model year 2019 market, growing to 7.8% by model year 2026. (NPRM at 43,775). This means that the vast majority of vehicles addressed by the rulemaking will rely on varying blends of ethanol and gasoline. All gasoline light duty vehicles on the road today are approved for use with a 10% ethanol blend and 98% of the gasoline used in the US is

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9326/abde08. For other sources showing corn ethanol greenhouse gas reductions up to 70% versus gasoline, see e.g., Lewandrowski (USDA) et al., *infra*.

[2] University of California, Riverside (April 2018): https://fixourfuel.com/wp-content/uploads/2018/04/UC-Riverside-Study.pdf.

[3] The NPRM finds that electric vehicles will have limited market deployment (less than 8%) over the time period covered by this rulemaking. (NPRM at 43,775).

[4] See Growth Energy Retailer FAQ, noting "More than 95 percent of the vehicles on the road today are approved for using E15," available at https://growthenergy.org/resources/retailer-hub/retailer-faq/.

[5] See Scully et al, *Carbon intensity of corn ethanol in the United States: state of the Science* (2021, Environ. Res. Lett), finding corn ethanol reduces GHGs 46% versus gasoline, available at https://iopscience.iop.org/article/10.1088/1748-9326/abde08. This and other sources show readily feasible corn ethanol greenhouse gas reductions over 50% versus gasoline. See e.g., Lewandrowski (USDA) et al., *The greenhouse gas benefits of corn ethanol – assessing recent evidence* (March 2019), available at https://www.tandfonline.com/doi/full/10.1080/17597269.2018.1546488.

blended with at least 10% ethanol.[6] Furthermore, almost all gasoline light duty vehicles on the road today can run on up to 15% ethanol.[7] EPA also ignores the key greenhouse gas-reducing role of flex-fuel vehicles (FFVs), which can run on up to 85% ethanol and were 20% of all vehicles produced for the U.S. market as recently as 2014.[8] Moreover, various next generation engines, including downsized and turbo-charged engines, may be particularly well suited to run on mid-level ethanol blends, which provide a clean, renewable source of octane.[9]

EPA ignores the lifecycle *benefits* of ethanol, while not considering the full lifecycle emissions of other vehicle technologies including electric vehicles. The NPRM does not have any extended discussion regarding lifecycle analysis of vehicle greenhouse gas emissions, which includes tailpipe emissions, "upstream" greenhouse gas emissions associated with the fuel and vehicle production, and carbon uptake of biogenic materials whereby carbon is effectively "recycled" in biofuels.

In a veiled discussion, the NPRM does recognize – and then selectively ignores – upstream emissions. The NPRM say its analysis estimates the "GHG and non-GHG emission impacts (tailpipe and upstream)" of the proposal (NPRM at 43,734). Later, the NPRM emphasizes analysis of "upstream emissions associated with the fuels used to power those vehicles (both at the refinery and the electricity generating unit)." (NPRM at 43,777). However, the NPRM then says, "EPA is continuing to use tailpipe-only values to determine vehicle GHG emissions, without accounting for upstream emissions (EVs and PHEVs will continue to use 0 g/mile through MY 2026)." (NPRM at 43,746).

Thus, EPA selectively ignores lifecycle emissions associated with fuel use derived from electricity. The NPRM assumes-away the upstream emissions of EVs and PHEVs, assigning them a value of zero grams per mile, even though the NPRM assumes electric power plants – and thus EVs – will use fossil fuel electricity through 2050 (NPRM at 43,779-80).

The importance of fully considering lifecycle greenhouse gas emissions is widely recognized by EPA and other stakeholders. For instance, the credits generated under the California Low Carbon Fuel Standard (LCFS) are based on lifecycle greenhouse gas emissions.[10] The United States Department of Energy and national labs have extensively assessed lifecycle greenhouse gas emissions of light duty vehicle fuels, including in conjunction

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[6] See e.g., EIA, *Almost all U.S. gasoline is blended with 10% ethanol* (May 4, 2016), available at https://www.eia.gov/todayinenergy/detail.php?id=26092 also AFDC: Alternative Fuels Data Center: Ethanol Fuel Basics (energy.gov)

[7] See Growth Energy Retailer FAQ, *supra*, noting "More than 95 percent of the vehicles on the road today are approved for using E15."

[8] EPA, *Manufacturer Performance Report for the 2016 Model Year* (January 2018), p. 27, available at https://www.regulations.gov/document/EPA-HQ-OAR-2018-0283-0647.

[9] See e.g., Oak Ridge National Laboratory, *Summary of High-Octane, Mid-Level Ethanol Blends Study* (July 2016), pp. 1-2, available at https://info.ornl.gov/sites/publications/Files/Pub61169.pdf.

[10] See California Air Resources Board, *Low Carbon Fuel Standard – About* (noting the program is based on the principle that each fuel has "life cycle" greenhouse gas emissions and "This life cycle assessment examines the GHG emissions associated with the production, transportation, and use of a given fuel"), at https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about.

with the GREET model used by EPA.[11] The NPRM itself notes that "upstream emissions factors" used in its models are from the "DOE/Argonne GREET model." (NPRM at 43,779). Furthermore, materials in the interagency review materials for this docket note "The GREET model is widely recognized as a reliable tool for life cycle analysis (LCA) of transportation fuels and has been used by several regulatory agencies."[12] A National Academy of Sciences report in this docket's interagency review materials finds a "full fuel cycle assessment more fully captures the total light-duty vehicle system greenhouse gas emissions and energy consumption than an onboard, in-use consumption or emissions metric, and *more evenly compares vehicles using different fuels*."[13]

The National Academy of Sciences, in these docketed materials, further finds that "use of only tailpipe rather than full-fuel-cycle GHG emissions incentivizes the deployment of zero-emission vehicles, but it misrepresents the actual carbon emissions associated with energy use in a light-duty fleet," and "As alternative powertrain technologies continue to be adopted, considerations of life cycle environmental impacts and how vehicle policies may affect multiple sectors become especially important."[14] The National Academy of Sciences further finds:

> "Notably, if deep GHG emissions reduction is a goal, then there will need to be consideration of not only onboard vehicle emissions, but also the emissions from related sectors, like electricity (for vehicle charging), and manufacturing (of vehicles and their materials and components). This motivates the need for life cycle thinking.[15]"

Other stakeholders have recognized the importance of the EPA vehicle program fully considering lifecycle greenhouse gas emissions. For instance, in a statement on release of the NPRM, NGVAmerica stated "EPA is aware of the environmental benefits of renewable [fuel], but it has resisted including credits for fuels based on upstream emission reductions. The fact that EPA is unwilling to look at the well-to-wheel benefits of different fuels and technologies and reward them with regulatory credits puts … low-carbon fuels at a significant disadvantage to electric vehicles."[16]

This lifecycle greenhouse gas emissions issue is not new to EPA. In addition to the above-referenced citations to upstream emissions in the NPRM, EPA's 2012 final rule on vehicle greenhouse gas standards stated, "EPA is glad to see the advances in research on this important topic [of lifecycle greenhouse gas emissions] and *plans to monitor new work in this area,*" but "the agency continues to believe that, as of the time of this rulemaking, there is too much uncertainty about the life-cycle impacts of future advanced technologies to conduct the

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[11] See e.g., Argonne National Lab overview of the GREET model at https://greet.es.anl.gov/.
[12] See Executive Order 12866 materials, available in this docket at Docket ID No. EPA-HQ-OAR-2021-0208-0164, PDF p. 696, regarding ICF, *Health Benefits of Transition to Zero Emission Transportation Technologies* (September 2, 2020), p. 31.
[13] See *Id*. at PDF p. 1597, referencing National Academy of Sciences (NAS), *Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy—2025-2035* (2021 publication copy) (emphasis added), NAS p. 13-416.
[14] *Id* at PDF *pp. 1516 and 1558 (NAS report pp. 10-335 and 12-377].*
[15] *Id*. at PDF p. 1566 (NAS report p. 12-385).
[16] See NGVAmerica, *Biden Administration Moves to Accelerate Electric Vehicles* (August 11, 2021), available at https://ngvamerica.org/2021/08/11/biden-administration-moves-to-accelerate-electric-vehicles.

type of detailed, vehicle-specific assessments that would be needed in a regulatory context."[17] The state of lifecycle impacts knowledge has evolved considerably since 2012, including numerous analyses, and implementation of California's LCFS where ethanol has played a key role as one of the largest sources of greenhouse gas emission reductions under that program.[18]

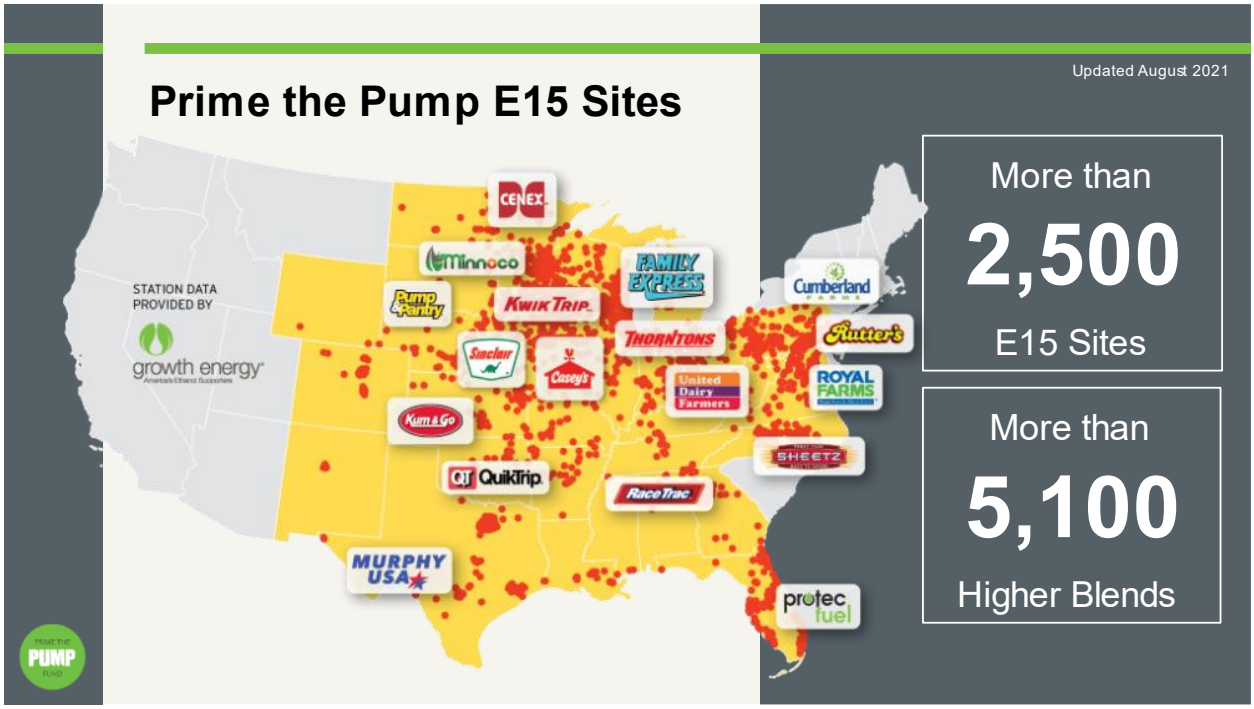
Regarding EPA's extensive knowledge of and experience with life cycle greenhouse gas emissions analysis, the Renewable Fuel Standard (RFS) program administered by EPA is predicated on biofuels reaching certain thresholds of lifecycle greenhouse gas reductions to qualify for programmatic benefits. In its past 2012 rulemaking on EPA vehicle GHG standards, EPA asserted the existence of the RFS as an excuse not to consider life cycle emissions in its vehicle greenhouse gas program.[19] However, the RFS only addresses *fuel* incentives, and alternative fuel *vehicle* incentives in this current 2021 NPRM are critical to ensure that both low carbon fuels and vehicles are available to work synergistically to reduce greenhouse gas emissions. Furthermore, the RFS just establishes a floor for biofuels use. Incentives for vehicles that can use high levels of biofuels (such as FFVs) are necessary to promote the higher use of biofuels and the corollary greenhouse gas emission reductions of doing so. Incentives for FFVs under EPA's vehicle greenhouse program can facilitate compliance with both the vehicle greenhouse gas program and the RFS, enabling far greater greenhouse gas emissions reductions than the floors established by those programs.

EPA should take action to encourage the use of higher biofuel blends such as E15 and E85 in today's vehicle fleet including providing year-round access with vapor pressure parity.

Today, E15 is approved for all 2001 and newer vehicles, more than 95% of today's vehicle fleet and more than 97% of the vehicle miles traveled. Two recent studies found that by moving to E15 nationwide, we can immediately reduce greenhouse gas emissions by more than 17 million tons, the equivalent of taking nearly 4 million cars off the road while also creating an additional 183,000 U.S. jobs.[20] [21] In order to facilitate the use of E15 nationwide and gain these important GHG and economic benefits, EPA must provide US consumers with greater access to the fuel. Given the oil refiners' recent court victory to deny American consumers year-round access to E15, it is imperative that EPA take all actions to restore RVP parity for E15. E15 remains available for year-round sale in reformulated gasoline markets as well as other low-vapor pressure areas that also give parity between E10 and E15. EPA should embark immediately under its existing authority to regulate vapor pressure to extend this parity in other

[17] See EPA final rule, *2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards*, 77 FR 62,624, 62,912 (October 15, 2012) ("EPA 2012 Final Rule") (emphasis added).
[18] See e.g., https://ww3.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm.
[19] EPA 2012 Final Rule, 77 FR 62,823.
[20] Darlington, "GHG Benefits of E15 Ethanol Use in the United States": National E15 Analysis Final (airimprovement.com)
[21] Urbanchuk: "Economic Impact of Nationwide E15 Use": Microsoft Word - Nationwide E15 Use Economic Impact Final.docx (growthenergy.org)

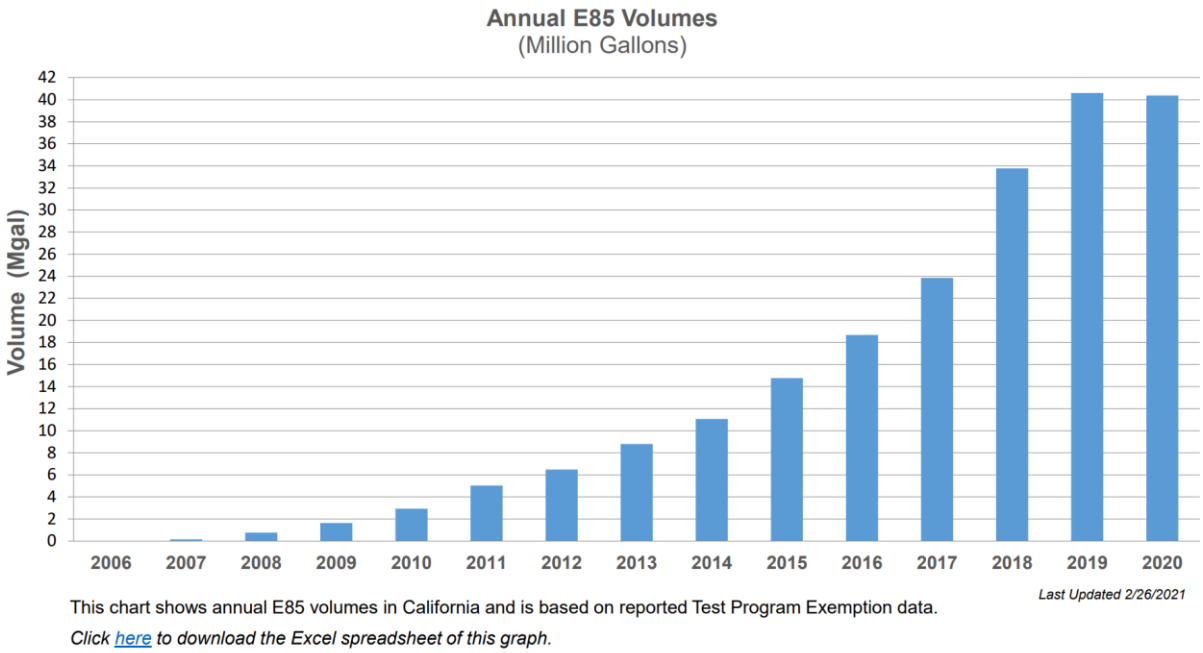
conventional fuel markets as well. Not only will the sale of E15 deliver greenhouse gas and economic benefits, providing parity by lowering the vapor pressure of fuel in the conventional markets will result in considerable emission benefits as has been noted and seen in RFG and other vapor control markets. Additionally, EPA should finalize the pending regulation that would broaden the use of existing fueling infrastructure for use with E15 as well as to simplify the label for American consumers.[22] By broadening availability and use of existing infrastructure, EPA will provide consumers access to these higher biofuel blends that deliver meaningful GHG and other emissions benefits.



Source: Prime the Pump

In addition to E15, it is also important to consider the use of E85 in the sizeable flex-fuel vehicle fleet. Today, there are more than 20 million FFVs on the road and more than 5,000 fueling locations across the country. In California alone, the use of E85 has more than tripled since 2014 (see table below, "Annual E85 Volumes").[23] Given the considerable GHG benefits, EPA should take additional actions to ensure the continued production of FFVs in conjunction with the growing use of E85. Further below, we will provide additional considerations to encourage and promote the continued production of flex-fuel vehicles.

[22] EPA, "E15 Fuel Dispenser Labelling and Compatibility with Underground Storage Tanks": 2021-00203.pdf (govinfo.gov)
[23] California Air Resources Board, "Annual E85 Volumes": Alternative Fuels: Annual E85 Volumes | California Air Resources Board



Source: California Air Resources Board

EPA should require a minimum octane standard and approve a high-octane, low-carbon mid-level ethanol blend.

It is imperative to consider the benefits of using high-octane, low carbon fuels to make engines more efficient. Growth Energy has been a leader on the need for higher octane, mid-level ethanol blends, first submitting a proposal for a 100 RON, E30 fuel nearly a decade ago. The science supporting the benefits of a high-octane, low carbon midlevel blend in conjunction with a high compression ratio engine is not new, and has been well-explored by the national labs, automobile manufacturers, and other scientific institutions.[24] Ethanol has a very high-octane number, has a lower carbon content than the gasoline components it replaces, and has myriad other benefits that assist in combustion to increase engine efficiency and reduce both greenhouse gas and tailpipe criteria pollutant emissions. We are attaching our previous submission and related comments for your review. We urge EPA to move quickly to require a minimum octane standard as well as to approve a high-octane, mid-level ethanol blend such as that first proposed by Growth Energy for vehicle certification as well as for consumer use. By moving towards higher octane, lower carbon mid-level blend, automakers can optimize engines to further improve efficiency and further reduce both greenhouse gas and tailpipe emissions.

[24] See e.g., Oak Ridge National Laboratory, *Summary of High-Octane, Mid-Level Ethanol Blends Study* (July 2016), available at https://info.ornl.gov/sites/publications/Files/Pub61169.pdf.

EPA should establish strong renewable volume obligations (RVO) for 2021, 2022, and well into the future to encourage the production and use of lower carbon biofuels.

The RFS has been one of our nation's most effective climate programs. In fact, Argonne National Laboratory recently found that with the advent of the RFS, the carbon intensity of corn ethanol has fallen by 23 percent.[25] Because of ethanol's use in fuel, EPA must continue to advance the goals of the RFS and provide access to and a foundation for these lower carbon biofuels. To that end, the agency must establish clear and strong RVOs for 2021, 2022, and set strong volumes under the RFS "Set" well into the future. EPA must also move expeditiously to approve pending pathways and pathway registrations including those for cellulosic biofuels from kernel fiber and other technologies that have languished at the agency for years. In many cases, these fuels are already certified to cellulosic carbon intensities under California's LCFS but have yet to receive approval as such by EPA for the RFS.[26] EPA must move quickly to approve these pathways and give certainty to the renewable fuel market by establishing strong volumes so that the vehicles of today and tomorrow can reduce their climate footprint through the increased use of lower carbon biofuels.

EPA must make technical adjustments to further incentivize production and use of flex-fuel vehicles (FFVs).

EPA must re-instate the volumetric conversion factor (VCF) for FFVs. Doing so provides incentives for all the main types of alternative fuel, low-carbon vehicles, not just a subset of preferred technologies.

By way of background, a statutorily derived volumetric conversion factor (VCF) of .15 is specified for calculating CAFE compliance for ethanol FFVs. The statutory provisions at 49 U.S.C. 32905(a) establishing the .15 VCF are incorporated into EPA regulations at 40 CFR 600.510-12(j)(2)(iv)(B) for FFV greenhouse gas calculations through model year 2015. FFV fuel ("E85") nominally contains up to 85% ethanol and only 15% gasoline, parallel to the .15 factor.[27] Under EPA regulations, the .15 VCF is still used to increase the fuel economy compliance value of FFVs, to reflect the CAFE program's goal to reduce petroleum consumption.[28]

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[25] Jandeska, ANL; "Corn Ethanol Reduces Carbon Footprint, Greenhouse Gases": Corn ethanol reduces carbon footprint, greenhouse gases | Argonne National Laboratory (anl.gov)

[26] California Air Resources Board, Certified Carbon Intensities and Pathways: LCFS Pathway Certified Carbon Intensities | California Air Resources Board

[27] See National Academy of Sciences, *Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles* (2015), p. 60 (stating that the .15 factor is "to reflect that E85 is considered to consist of only 15 percent petroleum-derived fuel), available at https://www.nap.edu/catalog/21744/cost-effectiveness-and-deployment-of-fuel-economy-technologies-for-light-duty-vehicles.

[28] See the .15 factor in 40 CFR 600.510-12(c)(2)(v), which continues to apply under CAFE regulations.

EPA must re-instate the VCF for FFVs based on the significant greenhouse gas emission reductions benefits of these FFVs.

EPA has emphasized the desire to move to "near-zero emissions" technology, and FFVs can be a "near-zero emission technology."[29] RFS calculations have generally found no tailpipe CO_2 emissions for ethanol when calculating lifecycle emissions.[30] This is because tailpipe CO_2 is regenerated by crops used as fuel feedstock. This biogenic carbon uptake and EPA approach merit use of the VCF for the ethanol component of E85. This "zero emissions" ethanol (as found by EPA) can be matched with renewable naphtha for a 100% renewable, "zero carbon" fuel. Additional innovations at biorefineries and on the farm, along with cellulosic biofuels can also get to zero greenhouse gas emissions on a lifecycle basis.

Cost considerations also dictate EPA fully considering incentivizing FFVs. The NPRM states standards under Clean Air Act section 202(a), which provides the statutory authority for this rulemaking take effect "after such period … necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." (NPRM at 43,728). Importantly, FFVs are a lower-cost compliance option compared to other more expensive technologies. It is imperative that EPA consider these lower-cost, highly effective solutions in its rulemaking analysis.

The VCF is also justified under EPA criteria in the NPRM to "to accelerate the introduction of zero and near-zero emissions vehicles and maintaining momentum for that market transition." (NPRM at 43,757). The NPRM references these criteria regarding the need for EV/PHEV/FCV incentives, but these criteria also apply to FFVs. Notably, the same needs of "maintaining momentum" apply to FFVs. Without reestablishing the VCF, automakers will stop making FFVs, eliminating a key compliance option for the vehicle greenhouse gas and CAFE programs. After EPA stopped allowing the VCF for vehicle greenhouse gas program compliance calculations, FFV production dropped from almost 20% of all 2014 light-duty vehicles to only about 8% of 2016 vehicles.[31] FFV production for 2019 was down by almost 75% relative to 2014.[32] Clearly, this is a loss in "momentum," and the VCF is needed to accelerate use of FFVs as a critical greenhouse gas reduction technology.[33]

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[29] See e.g., NPRM at 43,726, which is the first page of the NPRM, referencing EPA's desire to incentivize "near-zero" emission technology.

[30] See RFS final rule at 75 FR 14,670 (March 26, 2010) and accompanying regulatory impact analysis. As mentioned above, the RFS provides only a "floor" of demand for *fuels* that meet minimum lifecycle reduction thresholds; using a VCF in EPA's vehicle GHG program is essential to incentivizing FFV production to promote *vehicles* that can use those lower carbon fuels.

[31] EPA, *Manufacturer Performance Report for the 2016 Model Year* (January 2018), p. 27, available at https://www.regulations.gov/document?D=EPA-HQ-OAR-2018-0283-0647.

[32] EPA, *2020 EPA Automotive Trends Report* (January 2021), pp. 83-84, available at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1010U68.pdf.

[33] Potential EPA concerns regarding less-than-optimal E85 use by FFVs during this time period are misplaced, because EPA failed to enforce the Renewable Fuel Standards during this time frame, which undercut an important source of improved E85 pricing during this timeframe. Now, with increasing desires by EPA to reduce greenhouse gas emissions, and the use of a real-world F factor in EPA regulations reflecting E85 use, FFVs are primed to be an important compliance option based on real-world greenhouse gas emission reductions.

FFVs meet other EPA criteria for vehicle incentives under EPA's vehicle greenhouse gas program. For instance, EPA identifies the need for "significant" greenhouse gas emission reductions from incentivized technologies.[34] Still elsewhere, EPA emphasizes the need for low-emissions technologies that create "opportunities for achieving the more stringent later year standards."[35] FFVs can achieve "significant" greenhouse gas emission reductions and create "opportunities for achieving the more stringent later year standards." Under various aspects of the NPRM's stated logic, FFVs should receive the VCF incentives to fully reflect the greenhouse gas benefits of FFVs.

The VCF avoids the adverse programmatic consequences of multipliers.

Once FFVs are also appropriately incentivized, based on their significant lifecycle greenhouse gas emissions benefits, all the main kinds of alternative fuel vehicles (FFVs, EVs, PHEVs, and fuel cell vehicles) would be covered by at least some vehicle greenhouse gas program incentive. This would avoid EPA focusing on any one or subset of alternative fuel technologies. Technology-neutral, performance-based standards are broadly preferred. For instance, the NPRM interagency review raised questions about the "necessity of multiplier credits" which "are not technologically neutral" and could be "counterproductive."[36] EPA should follow this technology-neutral approach by providing appropriate incentives for all the major types of alternative fuel vehicles, based on their ability to reduce lifecycle greenhouse gas emissions.

The VCF avoids the adverse programmatic consequences of multipliers. EPA recognizes multipliers "reduce the effective stringency of the standards" by counting more than once (multiplying) benefits from a single vehicle. (See e.g., NPRM at 43,733). Also problematic regarding EPA's use of multipliers, EVs and PHEVs are not truly a near-zero emission technology because, regarding their fuel, EVs and PHEVs rely on electric generation which broadly is not "near zero" emissions. The NPRM finds the electric generating sector will rely on fossil fuels through 2050.[37] Because EVs and PHEVs rely on fossil fuel electricity well into the future, these EVs and PHEVs are not "near zero" greenhouse gas emissions vehicles. By contrast, a VCF for FFVs based on lifecycle greenhouse gas emission reductions does not have the detrimental effect of "reducing the effective stringency of the standards" because all these FFV emissions reductions are (a) "real-world" and (b) not counted more than once. It is arbitrary and capricious for EPA to fail to incentivize FFVs with a VCF that can meet the metrics that EPA uses for other vehicle incentive technologies without the detrimental impacts of the EV/PHEV multipliers.

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[34] See e.g., NPRM at 43,760, noting the NPRM's proposed elimination of multiplier incentives for natural gas vehicles because "EPA does not view NGVs as a pathway for *significant* vehicle GHG emissions reductions" (emphasis added).
[35] NPRM at 43,761, referencing incentives for full-sized pickups.
[36] Executive Order 12866 materials, PDF p. 2145, available in this docket at Docket ID No. EPA-HQ-OAR-2021-0208-0164 (July 23, 2021, email of Julia Burch to Matthew Oreska, EOP/OMB, providing "list of the overarching interagency comments").
[37] See NPRM at 43,779-80.

The VCF must be reinstated in the GHG program for FFVs in a manner similar to how it currently appears in the regulations for FFVs through model year 2015, which is a relatively straightforward regulatory fix.

The VCF must be reinstated for FFVs in EPA's vehicle greenhouse gas program (in a manner similar to how it currently appears in 40 CFR 600.510-12(j)(2)(iv)(B) for FFVs through model year 2015), to reflect the lifecycle greenhouse benefits of ethanol. Under these existing EPA regulations as currently stated in the CFR applicable through model year 2015, the tailpipe carbon emissions of FFVs are multiplied by the VCF to reflect the lifecycle greenhouse gas benefits of ethanol use. The desired, restored formula would be as follows, when assessing FFV carbon emissions (formally referred to as Carbon Related Exhaust Emissions or "CREE"):

$$CREE = (F \times CREE_{E85} \times \underline{\mathbf{VCF}}) + ((1 - F) \times CREE_{gas}).$$[38]

Through model year 2015, the VCF was established at .15. This is appropriate where, under certain EPA approaches to calculating greenhouse gas emissions, the ethanol portion of E85 (nominally 85% of the fuel) can be considered "zero carbon." As noted above, RFS calculations have generally found no tailpipe CO_2 emissions for ethanol when calculating lifecycle emissions.[39] EPA should use a VCF of .15 (based on the Congressional level set under the CAFE standards) or such other level as EPA considers reflects the lifecycle greenhouse gas benefits of ethanol. For EPA's greenhouse gas vehicle program, a VCF of at least is .5 (perhaps also multiplied by .85 to reflect the nominal ethanol content of E85) is appropriate based on ethanol averaging approximately 50% lower greenhouse gas emissions than gasoline on a full lifecycle basis.[40]

To put the VCF in the CREE formula into perspective, for a selected FFV based on a popular model type (a Ford F-150), E85 has had about a 10% lower CREE based on the FFV's tailpipe emissions alone. This improves that FFV's overall CREE around 1.4% without the VCF.[41] Applying the VCF to account for ethanol's lifecycle carbon benefits improves that FFV's CREE about 10% to 6% (if a VCF of .15 or .5, respectively, is used in the above CREE formula).

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[38] See 40 CFR 600.510-12(j)(2)(iv)(B) that has the 0.15 factor for model year 2012-2015 GHG calculations, and 40 CFR 600.510-12(j)(2)(vi) that dropped the 0.15 factor for Model Year 2016 and later and specifies the F factor. The "F" factor establishes the percent FFVs are assumed to use E85 versus gasoline and is set by EPA at 14%.

[39] See RFS final rule at 75 FR 14,788 (2010) and accompanying regulatory impact analysis, *supra*. As mentioned above, the RFS provides only a "floor" of demand for *fuels* that meet minimum lifecycle reduction thresholds; using a VCF in EPA's vehicle GHG program is essential to maintaining FFV production to promote *vehicles* that can use those lower carbon fuels and achieve higher levels of biofuel use.

[40] See Scully et al, *Carbon intensity of corn ethanol in the United States: state of the Science*, *supra*, finding corn ethanol reduces GHGs 46% versus gasoline, *supra*. This and other sources show readily feasible corn ethanol GHG reductions over 50% versus gasoline. See e.g., Lewandrowski (USDA) et al., *The greenhouse gas benefits of corn ethanol – assessing recent evidence*, discussed *supra*.

[41] These figures are based on a Ford 150 FFV that has CREE of 468 grams/mile using E85 and 522 grams/mile using gasoline. This calculation is based on using E85 instead of gasoline for 14% of fueling per the above "F" factor. The real-world greenhouse gas reductions of this and other FFVs would increase significantly as E85 fueling is used more often, including under strong Renewable Fuel Standards, which would increase the F factor.

In summary, for all the reasons stated above, EPA must provide the VCF for FFVs, established at a level of .15 or some other figure that accurately reflects the lifecycle greenhouse gas emissions reduction benefits of E85 used in FFVs. If the VCF is reinstated, the rule would be appropriately technology neutral with the EV/PHEV/FCV multipliers continuing on at the levels and limits proposed in the NPRM. EPA's best option is simply to restore the VCF for FFVs which should be re-instated under any circumstances. Reestablishing the VCF is appropriate under the EPA vehicle greenhouse gas program's statutory authority, as the VCF has previously been in place under the regulations through model year 2015.[42] The NPRM's own goals for reducing greenhouse gas emissions from light duty vehicles, for all the reasons stated above, dictate that EPA should reestablish the VCF for FFVs within the EPA vehicle GHG program.

The proposal appropriately allows performance based GHG incentives for full-size pickups, which should be adjusted slightly to incentivize FFV pickups.

The NPRM gives "performance-based credits" for full-size pickups with 15 to 20% better CO_2 performance than their footprint-based targets. (NPRM at 43,761). EPA offers this incentive because "introduction of low-emissions technologies in this market segment creates more opportunities for achieving the more stringent later year standards." (*Id*.). This approach is reasonable for full-sized pickups.

This technology neutral approach is appropriate whereby "These performance-based credits have no specific technology or design requirements; automakers can use any technology or set of technologies as long as the vehicle's CO_2 performance is at least 15 or 20 percent below the vehicle's footprint-based target." (NPRM at 43,761). Performance-based, technology-neutral approaches for EPA vehicle incentives are generally preferred, as stated above, and this approach should allow FFVs and other alternative fuel vehicles to compete on a level playing field.

While this performance-based approach is appropriate, full-size pickups should qualify based on 10% CO_2 reduction measured at the tailpipe. Thus, under 40 CFR §86.1870-12 ("CO_2 credits for qualifying full-size light pickup trucks"), the figure 0.8 should be changed to 0.9 to allow incentives for full size pickup trucks that achieve carbon-related exhaust emissions less than or equal to 10% below the applicable target value. (See NPRM at 43,810 citing proposed regulatory text at 40 CFR §86.1870-12(b)(2)).

In the alternative, a 15-20% CO_2 reduction below the vehicle's footprint-based target is appropriate to trigger incentives if the VCF is applied to full-size FFV pickups for purposes of calculating this CO_2 reduction threshold. Under this approach, text would be added to 40 CFR §86.1870-12 so that, for purposes of qualifying for the credit under §86.1870-12(b)(2), the CREE for the ethanol portion of FFV fuel use would be multiplied by the VCF. If the CREE

[42] As noted above, the GHG program is derived from general authority for regulating motor vehicles under CAA section 202(a).

incorporating the VCF would be less than 15-20% of the applicable target value, FFV full-sized pickups should qualify for the incentive.

EPA notes that "full-size pickup truck credits are appropriate to further incentivize advanced technologies penetrating this particularly challenging segment of the market." (NPRM at 43,761). FFV technology has been readily deployed for pickups, which provides yet another reason to align these pickup incentives for use with FFVs. Finally, these performance-based credits for full sized pickups, for which FFVs may qualify, should extend through the last year covered by this rulemaking (model year 2026), to allow for manufacturers to recoup the costs of upgrading these pickups as FFVs. The regulatory text states, "A pickup truck that qualifies for this credit in a model year may claim this credit for a maximum of four subsequent model years (a total of five consecutive model years)." (NPRM at 43,810). Given this timing, the credit should extend through model year 2026.

Thank you in advance for your consideration and please let us know if you have any questions.

Sincerely,

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