February 10, 2023

U.S. Environmental Protection Agency
1301 Constitution Avenue NW
Washington, DC 20004

Submitted via the Federal eRulemaking Portal: Regulations.gov

Re: Clean Air Task Force's Comments in Response to EPA's Proposed Rule: Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes, Docket ID No. EPA–HQ–OAR–2021–0427, 87 Fed. Reg. 80582[1]

Clean Air Task Force ("CATF") is pleased to offer comments in response to the U.S. Environmental Protection Agency's ("the Agency" or "EPA") proposed rule, Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes (Docket ID No. EPA–HQ–OAR–2021–0427). CATF is a global nonprofit organization working to safeguard against the worst impacts of climate change by catalyzing the rapid development and deployment of low-carbon energy and other climate-protecting technologies. With over 25 years of internationally recognized expertise on climate policy, science, and law, and a commitment to exploring all potential solutions, CATF is a pragmatic, non-ideological advocacy group focused on climate change and the clean energy transition. CATF has offices in Boston, Washington D.C., and Brussels, with staff working remotely around the world.

I. Introduction

CATF recognizes biofuels will play a role in decarbonizing the transportation sector and supports climate beneficial biofuel technologies advanced through mechanisms other than the Renewable Fuel Standard ("RFS"). The RFS is an ineffective program for meaningfully decarbonizing the transportation sector and to date has negatively impacted the climate, particularly due to the dominance of corn ethanol in meeting volume obligations. Among other shortcomings, the production of cellulosic and advanced biofuels has not grown to reach the volumes that Congress anticipated at the program's outset. At the same time, conventional biofuels such as unabated corn ethanol have exceeded anticipated volumes, and the concomitant land use change due to the need for increased corn production for ethanol has resulted in higher estimated carbon-intensity outcomes, thus resulting in negative environmental impacts and lower climate benefits than intended by the program.

Rather than recognizing these deficiencies and exercising discretion to curb them, EPA in the proposed rule, expands the RFS program. As a result, if the final rule reflects the proposal will be inconsistent with the Administration's plan for decarbonizing the transportation sector. That plan highlights the need to allocate biofuels to hard-to-decarbonize sectors like aviation[2] as well as the

[1] Referenced sources that are not publicly available are listed in the Table of Attachments, below, and included in the docket with this submission.
[2] U.S. Dep't of Energy, U.S. Dep't of Transp., EPA & U.S. Dep't of Housing and Urban Dev., The U.S. National Blueprint for Transportation Decarbonization: A Joint Strategy to Transform Transportation (2023) [hereinafter U.S. Dep't of Energy et al., *Blueprint*], https://www.energy.gov/sites/default/files/2023-01/the-us-national-blueprint-for-transportation-decarbonization.pdf.

goal of electrifying the vehicle fleet using wind and solar energy.[3] Neither of these policies are reflected in the proposed RFS rule. Instead, the proposed rule undermines these objectives. EPA must finalize a rule that prioritizes decarbonization policies that will have a greater impact on the transportation sector, such as a low- or zero-carbon fuel standard.

Our comments address four main topics that EPA solicited comments on in its proposal, specifically: (1) the time period for setting renewable fuel volumes and the proposed total renewable fuel volumes; (2) the incorporation of carbon intensity ("CI") scores and carbon capture and storage ("CCS") deployment into the corn ethanol volumes; (3) the proposed increase in biomass-based diesel ("BBD"); and (4) the proposed regulations governing the generation of Renewable Identification Numbers ("RINs") for electricity ("eRINs") made from biogas.

Upon review of the proposed rule and the statutory language authorizing the RFS program, CATF concludes that EPA should continue to set volumes for one year at a time, rather than the proposed three years, to allow for periodic reassessment of the climate impacts associated with the program. In addition, we urge EPA to decrease certain renewable fuel volumes during this one-year period. We further argue that to be more consistent with the Administration's decarbonization goals, EPA must use published science on the CI of corn ethanol and the availability of CCS to revise the corn ethanol volumes, reduce the volume of biomass-based diesel, and retract the proposed eRINs biogas volumes.

II. Background

Congress established the RFS in 2005 and expanded it in 2007.[4] Codified in the Clean Air Act, the RFS was intended to help the United States move toward "greater reliance on clean energy,"[5] and "greater energy independence and security."[6] To this end, the RFS requires that transportation fuels sold or introduced into commerce in the U.S. contain "at least the applicable volume of renewable fuel, advanced biofuel, cellulosic biofuel, and biomass-based diesel."[7] Anyone who produces or imports gasoline or diesel fuel ("obligated parties") must comply with the RFS by participating in a credit system.[8] Obligated parties can earn or purchase credits from other parties. Obligated parties must then submit these credits—known as renewable identification numbers or RINs—to EPA to meet their renewable volume obligation ("RVO").[9]

Until 2022, the statute itself set the required annual volumes of renewable fuels.[10] Starting with the current rulemaking, EPA is now required to set annual RVOs based on "a review of the

[3] *Id.* at 49.
[4] *See* 42 U.S.C. § 7545(o).
[5] *Growth Energy v. EPA*, 5 F.4th 1, 7 (D.C. Cir. 2021).
[6] *Alon Ref. Krotz Springs, Inc. v. EPA*, 936 F.3d 628, 634–635 (D.C. Cir. 2019).
[7] 42 U.S.C § 7545(o)(2)(A)(i).
[8] *Id.* § 7545(o)(5).
[9] *See* 40 C.F.R. §§ 80.1407(a), 80.1425, and 80.1427.
[10] *Id.* § 7545(o)(2)(B). For biomass-based diesel, the statute only supplied the required annual volume through 2012. 42 U.S.C § 7545(o)(2)(B)(i)(IV). Since then, EPA has set annual volumes.

implementation of the program during calendar years specified in the tables," as well as on six statutory factors.[11] The six factors that EPA must consider in setting volumes are:

> (1) the impact of the production and use of renewable fuels on the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply;
> (2) the impact of renewable fuels on the energy security of the United States;
> (3) the expected annual rate of future commercial production of renewable fuels, including advanced biofuels in each category (cellulosic biofuel and biomass-based diesel);
> (4) the impact of renewable fuels on the infrastructure of the United States, including deliverability of materials, goods, and products other than renewable fuel, and the sufficiency of infrastructure to deliver and use renewable fuel;
> (5) the impact of the use of renewable fuels on the cost to consumers of transportation fuel and on the cost to transport goods; and
> (6) the impact of the use of renewable fuels on other factors, including job creation, the price and supply of agricultural commodities, rural economic development, and food prices.[12]

Because these six distinct factors are mandated for consideration, EPA must weigh each point; no factor may be ignored or discounted.[13]

These six factors must be read in the context of the broader purpose of the Clean Air Act:[14] to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population."[15] The factors must also be read in the context of EPA's obligation to consider the environmental justice impacts of its programs. Executive Order 14008, for example, provides that "[a]gencies shall make achieving environmental justice part of their missions by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts."[16] As a result, EPA must holistically examine the impacts of volume obligations on marginalized communities.

---

[11] *Id*. § 7545(o)(2)(B)(ii).
[12] *Id*.
[13] *See DOC v. New York*, 139 S. Ct. 2551, 2585 (2019) (citing *Motor Vehicles Mfrs. Assn. v. State Farm*, 463 U.S. 29, 43 (1983)) (stating that an agency fails to meet its obligation to articulate a satisfactory explanation for an action where the agency has failed to consider an important aspect of the problem.).
[14] *King v. Burwell*, 576 U.S. 473, 493 (2015) ("We cannot interpret federal statutes to negate their own stated purposes.") (internal citations omitted).
[15] 42 U.S.C. § 7401(b)(1).
[16] 86 Fed. Reg. 7619, 7629 (Feb. 1, 2021). *See also* Executive Order ("EO") 12898, 59 Fed. Reg. 7629, 7629 (Feb. 16, 1994) (each federal agency "shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.").

III. The Time Period and Size of Renewable Fuel Volumes

This section addresses the following questions from EPA:

> *"We are therefore requesting comment on various alternative approaches that we could take, both with respect to volumes as well as certain other policy parameters. Specifically, we request comment on whether we should establish volume requirements for one or two years instead of three years, whether the implied conventional renewable fuel volume requirement should be 15.00 billion gallons rather than 15.25 billion gallons in 2024 and 2025, or whether the implied conventional renewable fuel volume requirement should be reduced by some other amount, such as below the E10 blendwall, while keeping the total renewable fuel volume requirement unchanged."*[17]

A. Time Period for Volumes

EPA should establish volume requirements for one year instead of three years for all renewable fuel types. This proposal marks EPA's first instance of proposing volumes for all renewable fuel types. Identifying and proposing appropriate volumes for multiple renewable fuel types is a large undertaking that requires extensive data collection and analysis. Especially in this case, where EPA is proposing regulations for an entirely new pathway (the proposed biogas-to-electricity pathway), many uncertainties are in play, including but not limited to CI scores associated with fuel production, and environmental justice implications. EPA must address and resolve these uncertainties while also adequately taking into account the six factors mandated for consideration by Congress.[18] This proposed rule references multiple analyses that have yet to be completed or initiated and that would contribute meaningfully to EPA's knowledge relevant to setting volumes.[19] EPA must refrain from setting volumes where there are clear, identifiable, knowledge gaps that could be mitigated by simply allowing more time for data collection and analysis. By setting volumes at this time for one year only, EPA can satisfy its congressionally established duty to set volumes while creating an opportunity for subsequent years' volumes to reflect

---

[17] Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes, 87 Fed. Reg. 80582, 80628 (proposed Dec. 30, 2022) [hereinafter RFS Proposed Update].

[18] 42 U.S.C. § 7545(o)(2)(B).

[19] EPA, EPA-420-D-22-003, *Draft Regulatory Impact Analysis: RFS Standards for 2023-2025 and Other Changes* 115 (2022), https://www.epa.gov/system/files/documents/2022-12/420d22003.pdf [hereinafter EPA, *Draft RIA*] ("[W]e intend to conduct a model comparison exercise that will produce new estimates of crop-based biofuel GHG emissions from multiple models to expand upon what is already in the literature for the types of volume changes required."); EPA, *Biofuels and the Environment: Third Triennial Report to Congress: External Review Draft (ERD)* IS-4 (2023), https://cfpub.epa.gov/ncea/biofuels/recordisplay.cfm?deid=353055 [hereinafter EPA, *Third Triennial Report ERD*] ("If a portion of the observed cropland expansion was due to the RFS Program, it may have had some effect on critical habitat and T&E species; however, whether that effect would have constituted an adverse effect in the context of the Endangered Species Act (ESA) is unknown."); *Id*. at 2–17, Box 2.2 ("Importantly, and in recognition of the need to update EPA's analytical work in this area, the Agency has initiated work to develop a revised modeling framework that would be applied to analyze the GHG impacts associated with biofuels."); Nat'l Acads. of Sci., Engineering, and Medicine, *Current Methods for Life Cycle Analyses of Low-Carbon Transportation Fuels in the United States* 213 (2022), https://nap.nationalacademies.org/read/26402/chapter/16#213 ("Though the study of induced land use changes from biofuels has been the topic of intense study over the last decade, substantial uncertainties remain on many key components of economic models used to assess these impacts. Further work is warranted to update these estimates of market-mediated land use change and the models.").

updated science, data, and analytics. This would improve not only the environmental outcomes of the program but also the legal durability of volumes set for each year.

EPA has correctly identified the need to establish pathways that incorporate consideration of CI scores in RIN apportionment.[20] To do this, EPA may opt to initiate a separate rulemaking proposing new pathways for corn ethanol with the production processes described below.[21] Because a new rulemaking for a corn ethanol pathway is necessary and takes time, EPA should refrain from setting renewable fuel volumes for the three-year period of 2023-2025 and instead set volumes only for 2023. This will give EPA time to perform the analysis and regulatory process necessary to set subsequent volumes that consider the actual CI scores of different ethanol production processes.

Finally, CATF opposes the proposed biogas-to-electricity implementing regulations, but if EPA finalizes them, the volumes and eRIN apportionment should only be set for 2024. There is high uncertainty with respect to this pathway due to the lack of regulation of emissions from landfills and large farms under the Clean Air Act and the high potential for methane leakage. The biogas-to-electricity pathway could lead to negative consequences for methane emissions and create incentives for continued landfilling of organic matter – rather than diversion of organic waste for treatment – and proliferation of confined animal feeding operations ("CAFOs"). Therefore, if EPA decides to move forward with this pathway, volumes should be set only for 2024 to allow for extensive monitoring and subsequent adjustment or, alternatively, make a decision to discontinue this pathway.

B. Magnitude of Volumes

Regardless of how many years EPA sets volumes for, the volumes of total renewable fuel – which are met mostly by corn starch ethanol – should not increase, for reasons described below. Instead, EPA should lower the corn ethanol volumes to the E10 blend wall, maintain biomass-based diesel ("BBD") volumes at 2022 levels, and refrain from issuing eRINS for biogas.

Since ethanol production is expected to be driven by gasoline demand containing 10% ethanol and because there are still constraints to expanding E15 and E85 infrastructure,[22] CATF recommends EPA cap the volume of conventional fuels at the E10 blend wall. Additionally, EPA should set lower volumes than those proposed for corn ethanol given the uncertainty around greenhouse gas ("GHG") impacts associated with corn ethanol and EPA's intent to develop a revised modeling framework of the GHG impacts associated with biofuels (discussed below under 'corn ethanol CI and CCS opportunities under the RFS Program'). Finally, as pointed out by EPA in its Third Triennial Report, maintaining volumes will reduce new environmental impacts though legacy environmental impacts may continue.[23]

EPA is also proposing to increase BBD volumes. For multiple reasons, CATF recommends EPA not increase BBD volumes and instead maintain the volumes at 2022 levels. First, there is great

[20] *See infra* pp. 6–8.
[21] *See infra* p. 8.
[22] *See generally*, EPA, *Draft RIA*, *supra* note 19.
[23] *See generally*, EPA, *Third Triennial Report ERD*, *supra* note 19.

uncertainty associated with the CI range of biodiesel and renewable diesel – especially related to emissions from direct and indirect land use change. Depending on model assumptions, the CI may be as high as 30 to 53 grams of carbon dioxide-equivalent per megajoule (g CO_2e/MJ).[24] Second, increased BBD volumes are likely to lead to unfavorable substitution effects of palm oil for soybean oil in the food market with adverse impacts on land use and GHG emissions.[25] Third, increased BBD demand in the U.S. (driven by renewable fuel mandates) can contribute to rising prices of vegetable oil.[26] Finally, vehicles that burn biodiesel release harmful particulate matter emissions and have negative impact on public health outcomes as opposed to other low-carbon/zero-carbon transportation methods.[27] For those reasons EPA should maintain BBD volumes at 2022 levels.

Finally, CATF recommends that EPA not issue eRINs for biogas given the many uncertainties and potential unintended consequences described in section VI below.

IV. Corn ethanol CI and CCS opportunities under the RFS Program

This section addresses the following questions from EPA:

> *"If EPA were to incorporate some measure of the carbon intensity of each biofuel into the RFS program (e.g., providing a higher RIN value for fuels with a better carbon intensity score), what approach would best advance the program's environmental objectives, and at the same time be consistent with the statutory provisions of CAA section 211(o)?"*[28]
> *"Are there steps EPA should consider taking under the RFS program to integrate carbon capture and storage (CCS) opportunities related to the production of renewable fuels?"*[29]
> *"How can EPA best build upon the policy investments that the IRA established to further develop low carbon renewable fuels, including through incentives established through the RFS program?"*[30]

Total renewable fuel volumes are currently met mostly by corn starch ethanol, therefore EPA must prioritize incorporating updated CI scores and CCS opportunities into the RFS pathways and volumes for corn ethanol.

---

[24] Hui Xu et al., *Life Cycle Greenhouse Gas Emissions of Biodiesel and Renewable Diesel Production in the United States*, 56 Env't Science & Tech. 7512 (2022), https://pubs.acs.org/doi/pdf/10.1021/acs.est.2c00289.
[25] *See* The Int'l Council on Clean Transp. ("ICCT"), *How rapeseed and soy biodiesel drive oil palm expansion* (2017), https://theicct.org/sites/default/files/publications/Oil-palm-expansion_ICCT-Briefing_27072017_vF.pdf; Fabio Santeramo, *Cross-price elasticities for oils and fats in the US and the EU* (2017), https://theicct.org/wp-content/uploads/2021/06/Cross-price-elasticities-for-oils-fats-US-EU_ICCT_consultant-report_06032017.pdf.
[26] ICCT, *supra* note 26.
[27] Jane O'Malley & Stephanie Searle, ICCT, *Air Quality Impacts of Biodiesel in the United States* (2021) (included as Attachment A).
[28] RFS Proposed Update, 87 Fed. Reg. at 80587.
[29] *Id.*
[30] *Id*.

CI scores for corn ethanol are highly variable in the research literature—ranging from 38 g CO_2e/MJ (59 percent reduction compared to baseline petroleum)[31] to 116 g CO_2e/MJ (25 percent higher than baseline petroleum).[32] This range reflects that fact that CI depends on modeled estimates of direct and indirect land use change impacts when previously non-cultivated[33] land is used to grow corn and when the production of existing commodities is replaced as farmers allocate more cultivated or previously non-cultivated land to corn production.[34] For example, research shows that domestic land use change emissions can range from -2.3 g CO_2e/MJ[35] to 38.7 g CO_2e/MJ[36] when the full life-cycle emissions are accounted for and depending on agricultural management practices, the initial land use, and the model and assumptions used. The CI may be higher than this range when international or indirect land use change impacts are considered. Importantly, the current scientific research suggests that the CI score of corn ethanol production on previously non-cultivated land would exceed the threshold for conventional renewable fuels under the RFS which must have a CI 22% lower than gasoline.

Corn ethanol's CI score also depends on whether the ethanol production process captures the highly concentrated CO_2 stream produced during fermentation and sequesters it permanently underground. For example, adding CCS to a typical dry mill ethanol plant (more than 90 percent of U.S. corn ethanol plants are dry mill plants) could further reduce the CI of corn ethanol by 31.4 g CO_2e/MJ.[37] Therefore, integrating CCS could decrease the range of CI of corn ethanol assessed in EPA's review of the literature from 38 g CO_2e/MJ to 116 g CO_2e/MJ to 6.6 to 84.6 g CO_2e/MJ. With the advent of the 45Z and 45Q tax credits in the Inflation Reduction Act, there is greater economic incentive for lower CI fuels and the installation of CCS at ethanol plants. EPA has identified this opportunity and noted its promising potential.[38] Reducing the CI of corn

---

[31] Melissa Scully et al., *Reply to Comment on 'Carbon intensity of corn ethanol in the United States: state of the science'*, Env't Rsch. Letters, Nov. 2, 2021, at 1, https://doi.org/10.1088/1748-9326/ac2e36.
[32] Tyler Lark et al., *Environmental Outcomes of the US Renewable Fuel Standard*, PNAS, Feb. 14, 2022, at 1, 3, https://doi.org/10.1073/pnas.2101084119.
[33] Two categories of cropland are recognized, cultivated and non-cultivated, as defined by U.S. Dep't of Agric. ("USDA"), Natural Resources Conservation Service, *Croplands*, https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/land/cropland (last visited Feb. 8, 2023); and USDA, Nat'l Agric. Stat. Serv., *2020 Cultivated Layer*, https://www.nass.usda.gov/Research_and_Science/Cropland/metadata/2020_cultivated_layer_metadata.htm (last visited Feb. 8, 2023).
[34] RFS Proposed Update, 87 Fed. Reg. at 80610 ("Lower GHG emissions are generally characterized by improvements in technology over time and lower land use change emissions (e.g., estimates that include more intensive use of existing agricultural land through double-cropping and other practices that increase yield without bringing more land into production), widespread adoption of agricultural practices intended to maintain soil carbon (e.g., cover crops), and the trend toward more efficient biofuel production practices.").
[35] As cited in Lark et al.'s supplemental material, land use change emissions can range from -2.3 g CO_2e/MJ (the negative sign indicating net sequestration, using GREET's "CENTURY/COLE" emissions factors with the Corn Ethanol 2013 scenario) to 38.7 g CO_2e/MJ. Lark et al., *supra* note 33.
[36] *Id*.
[37] Hui Xu et al., *Life-cycle greenhouse gas emissions reduction potential for corn ethanol refining in the USA*, 16 Biofuels, Bioproducts & Biorefining 671, 676 (2022), https://onlinelibrary.wiley.com/doi/epdf/10.1002/bbb.2348.
[38] RFS Proposed Update, Fed. Reg. at 80610, note 99 ("We note that lifecycle GHG emissions are also influenced by the use of advanced technologies and improved production practices. For example, corn ethanol produced with the adoption of advanced technologies or climate smart agricultural practices can lower LCA emissions. Corn ethanol facilities produce a highly concentrated stream of CO2 that lends itself to carbon capture and sequestration (CCS). CCS is being deployed at ethanol plants and has the potential to reduce emissions for cornstarch ethanol,

ethanol also aligns with the Administration's transportation decarbonization goals.[39] Incorporating CCS could theoretically result in the capture of 95 million tons of fermentation-generated CO_2 under a 15-billion-gallon corn ethanol mandate assuming each gallon of ethanol produced results in approximately 6.3 pounds of fermentation CO_2.[40] Proposed CO_2 pipelines in the Midwest will have the capacity to carry up to 29 to 43 million tons of CO_2 per year,[41] equivalent to 30 to 45 percent of fermentation CO_2 currently produced, when they are operational (in 2024 or 2025). These pipelines are not dedicated to capturing ethanol fermentation emissions and will convey non-ethanol-fermentation-generated CO_2, including emissions from coal burned at ethanol plants and CO_2 from fertilizer plants, but are largely focused on ethanol.

Recent scientific research shows that the upper bound of the estimated CI score for corn ethanol produced from previously non-cultivated lands (38.7 g CO_2e/MJ[42]) exceeds the CI threshold for renewable fuel established by EPA regulation.[43] Therefore, such corn ethanol would not be eligible to qualify for RINs. Given the high level of uncertainty associated with quantifying the GHG impact of land use-land cover change, and the difference between the CI of corn ethanol with and without CCS, CATF recommends the following approach.

As EPA raised in its proposal, the Agency should prioritize developing a revised modeling framework for the GHG impacts associated with biofuels, including corn ethanol.[44] The framework should incorporate current research on CI scores and a robust representation of land use change into the approved pathways for corn starch ethanol.

EPA should account for the range in GHG emissions and CI scores associated with different land use change effects and pollution controls by commencing a new rulemaking to distinguish between corn ethanol pathways from cultivated land, previously non-cultivated land converted to cultivated land, and corn ethanol produced with and without CCS. EPA should establish separate volumes for each pathway based on their CI scores. More RINs should be apportioned to the CCS pathway consistent with the more favorable CI of the fuel produced with this technology and reflect a reasonable timeline for CCS deployment. The other corn ethanol pathway volumes (or conventional fuel volumes if EPA determines ethanol produced with CCS qualifies as a D5 RIN) should be reduced and earn lower value RINs based on their higher CI scores. Furthermore,

---

especially if mills with CCS use renewable sources of electricity and other advanced technologies to lower their need for thermal energy. Climate smart farming practices are being widely adopted at the feedstock production stage and can lower the GHG intensity of biofuels. For example, reducing tillage, planting cover crops between rotations, and improving nutrient use efficiency can build soil organic carbon stocks and reduce nitrous oxide emissions.").

[39] *See generally,* U.S. Dep't of Energy, U.S. Dep't of Transp., EPA & U.S. Dep't of Housing and Urban Dev., *Fact Sheet: The U.S. National Blueprint for Transportation Decarbonization: A Joint Strategy to Transform Transportation* (2023), https://www.energy.gov/sites/default/files/2023-01/EERE_TranspoDecarb_factsheet-508_0.pdf

[40] *See generally* W. Morgan Summers, Nat'l Energy Tech. Laboratory et al., *Cost of Capturing CO_2 from Industrial Sources* (2014), https://www.netl.doe.gov/projects/files/CostofCapturingCO2fromIndustrialSources_011014.pdf.

[41] *Billionaire oil driller invests in Ames-based Summit's carbon-capture pipeline*, Des Moines Register (Mar. 2, 2022) (included as Attachment B); Heartland Greenway, https://heartlandgreenway.com/ (last visited Feb. 7, 2023); Erin Jordan, *How far would Iowa pipeline projects go toward U.S. climate change goals?*, The Gazette (Jan. 19, 2022, 6:00 A.M.) (included as Attachment C).

[42] Lark et al., *supra* note 33, at 3.

[43] 40 CFR § 80.1401.

[44] RFS Proposed Update, 87 Fed. Reg. at 80587.

as noted above, corn ethanol produced from previously non-cultivated land would not meet the renewable fuel threshold and therefore would not qualify for RINS. The volumes should be set to create incentives for a transition to fuels produced at facilities controlled with CCS. As such, the current potential CCS volume be the volume allocated to the corn ethanol with CCS pathway.

V. Biomass-based diesel (BBD)

This section addresses the following questions from EPA:

> *"We seek comment on the proposed increase to the BBD standard and whether other options should be considered."*[45]

As discussed above, EPA must consider the six statutory factors when setting the BBD target volumes for the RFS in the final rule. In proposing the BBD volumes, EPA has not adequately considered two of the six factors and, as a result, it set volumes that are too high.[46] CATF recommends that EPA not increase BBD volumes (as mentioned previously) and instead maintain them at 2022 levels. EPA failed to adequately consider the following two factors in its proposal: (1) the impact of the production and use of renewable fuels on the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply; and (2) the impact of the use of renewable fuels on other factors, including job creation, the price and supply of agricultural commodities, rural economic development, and food prices.

In considering the impact of increased BBD production on the environment, climate change, and land conversion, EPA must consider the negative ecosystem and environmental justice effects associated with an increase in palm oil production that will ensue because of higher BBD volumes. In April of 2022, the White House acknowledged the detrimental environmental effects of commodity palm oil production when it issued an executive order mandating a whole-of-government approach to eliminating U.S. purchases of commodities, including palm oil, grown on recently deforested land.[47] Increased use of soy oil for BBD production may increase U.S. palm oil imports because of substitute effects of palm oil for soy and expanded palm oil production, particularly in developing countries, such as Indonesia and Malaysia, where the majority of the world's palm oil is produced.[48] The production of palm oil has been linked to deforestation, habitat destruction, and loss of biodiversity, as well as social and labor rights issues.[49] EPA has also argued in past rulemakings that BBD from soy and canola oil would result

---

[45] RFS Proposed Update, 87 Fed. Reg. at 80626.

[46] *See Motor Vehicle Manufacturers v. State Farm*, 463 U.S. 29, 43 (1983) (an agency decision that fails to "consider[]…the relevant factors" is "arbitrary and capricious.")

[47] EO 14072, Strengthening the Nation's Forests, Communities, and Local Economies, 87 Fed. Reg. 24851 (Apr. 22, 2022).

[48] Fabio Gaetano Santeramo & Stephanie Searle, *Linking Soy Oil Demand from the US Renewable Fuel Standard to Palm Oil Expansion through an Analysis on Vegetable Oil Price Elasticities*, 127 Energy Policy 19 (2019) (included as attachment D)

[49] *See*, *e.g.*, Julia Nnoko-Mewanu, Human Rights Watch,*"When we lost the Forest, we lost everything*"*: Oil Palm Plantations and Rights Violations in Indonesia* (2019), https://www.hrw.org/sites/default/files/report_pdf/indonesia0919_web.pdf.

in increased palm oil imports to replace these oils for other uses, namely food and oleochemicals, as they would likely be replaced with the lowest cost alternative, which is currently palm oil.[50]

In considering the impact of creating incentives for increased BBD production on air quality, EPA must give more weight to the negative effects that increased particulate matter from diesel vehicles will have on public health outcomes. Diesel engines emit air pollutants including diesel particulate matter, which is responsible for 70 percent of total known cancer risk related to air toxics in California.[51] Although diesel particulate is expected to decline as vehicles are replaced by newer, cleaner burning diesel engines, diesel particulate matter remains a pollutant of concern.[52]

In considering the impact of increased BBD production on the price of food, EPA must give greater weight to the cost increases the public could see because of cooking oil being displaced to BBD production. Rising prices of vegetable oil have been linked to increase in BBD demand in the U.S. driven by renewable fuel mandates.[53] Biofuel production and the RFS have been linked to negative economic impacts on households (domestically and internationally) and worsening food security in developing countries.[54]

EPA must properly consider the statutory factors and maintain BDD volumes at 2022 levels.

VI. eRIN Pathway

This section addresses the following questions from EPA:

> *We request comment on this proposed framework for linking renewable electricity produced from qualifying biogas to transportation use.*[55]
>
> *We request comment on the reporting of air emission and liquid and solid effluent information as a condition of program participation for renewable electricity generators, RNG producers, and biogas producers.*[56]

---

[50] Renewable Fuel Standard (RFS) Program: RFS Annual Rules 87 Fed. Reg. 39600, 39611 (Jul. 1, 2022); Renewable Fuel Standard (RFS) Program: RFS Annual Rules 86 Fed. Reg. 72436, 72448 (Dec. 21, 2021).
[51] California Air Resources Board, *Overview: Diesel Exhaust & Health*, https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health (last visited Feb. 7, 2023).
[52] *Id.*; U.S. Energy Information Administration, *Deisel Fuel Explained* (Nov. 7, 2022), https://www.eia.gov/energyexplained/diesel-fuel/diesel-and-the-environment.php .
[53] *See generally*, Aaron Smith, *High Vegetable Oil Prices: Putin or Biofuels?*, The American Enterprise Institute for Public Policy Research (Jul. 5, 2022), https://www.aei.org/research-products/report/high-vegetable-oil-prices-putin-or-biofuels/.
[54] Yogeeswari Subramaniam et al., *The impact of biofuels on Food Security*, 160 Int'l Econ. 72 (2019) (included as Attachment E). Jane O'Malley & Stephanie Searle, ICCT, *The impact of the U.S. Renewable Fuel Standard on food and feed prices* (2021), https://theicct.org/wp-content/uploads/2021/06/RFS-and-feed-prices-jan2021.pdf .
[55] RFS Proposed Update, 87 Fed. Reg. at 80649.
[56] *Id*. at 80657.

We request comment on how to account for the uncertainty in projecting the quantity of eRINs in the RFS program, and specifically, whether we should be considering lower (or different) cellulosic volume requirements for 2024 and 2025 in this rule.[57]

As a general matter, for the purpose of reducing emissions from the light-duty vehicle segment, converting waste biogas to electricity and using that electricity to power battery electric vehicles is better than processing the waste biogas into compressed natural gas (CNG) for use in CNG vehicles. This is because there is less potential for methane slip in the biogas-to-power pathway. CATF generally supports capturing methane for beneficial use through methods such as diverting organic waste from landfills and using anaerobic digesters on farms to reduce odors, GHG emissions (lifecycle GHG emissions reportedly range from -533 to 44 gCO_2e/MJ[58]), and improving nutrient management. Setting eRINs volumes for biogas, however, is not an effective way to achieve these outcomes and would be detrimental to the environmental factors defined in statute.

A. EPA should not finalize the proposed eRIN regulations because of unresolved uncertainties that implicate air quality, climate change, and lifecycle greenhouse gas emissions.

EPA should refrain from registering parties to generate eRINs. Several critical uncertainties exist around issuing eRINs, including the potential for methane leakage, environmental justice concerns, and the proliferation of purpose-grown crops. The potential adverse impact of these uncertainties will grow if EPA issues eRINs and thereby creates incentives for expansion of the feedstocks of manure and landfill waste production, as has been the trend for all other renewable fuel pathways in the RFS program.

The uncertainties linked to eRINs are linked to air quality and climate pollution, which EPA must consider in setting volumes under the RFS. In promulgating a rule, EPA must "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made."[59] An agency "ordinarily fails to meet this standard if it has failed to consider an important aspect of the problem."[60] In the context of setting applicable volumes for renewable fuels under the RFS (including for eRINs in the cellulosic fuel category), EPA must consider "the impact of the production and use of renewable fuels on the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply."[61] As it stands currently, EPA has not completed several analyses that are necessary to inform how approving this eRIN proposal would affect critical concerns such as air quality, climate change, and ecosystem conversion.[62]

---

[57] *Id.* at 80587.
[58] *Id*. at 80611.
[59] *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (cleaned up).
[60] *DOC v. New York*, 139 S. Ct. 2551, 2585 (2019).
[61] 42 U.S.C. § 7545(o)(2)(B)(ii).
[62] *See* sources cited *supra* note 19.

1. Methane Leakage

The biogas produced from the proposed eRIN regulations would come from two types of methane sources: municipal solid waste facilities and farms engaging in manure management. It is uncertain how the proposed regulation would affect methane generation and pollution from these sources. EPA must sufficiently account for the environmental impacts of setting volumes, including uncertainty about methane leaks, particularly due to the lack of regulation in this area. Indeed, EPA has previously denied registering parties to generate eRINs on the grounds that the facilities had not "address[ed] significant technical and regulatory issues prior to facility registration."[63]

Even a small percentage (2 to 3 percent) of methane leakage from a digester may negate the carbon benefits of biogas feedstocks that otherwise degrade aerobically.[64] Typical methane losses are reported in the range of 1 to 4 percent.[65] Elevated rates of methane leakage have the potential to significantly increase the CI of the end-stage fuel. The RFS requires strict lifecycle analyses for determining CI to ensure that renewable fuels meet the goals of the program. The RFS defines "lifecycle greenhouse gas emissions" broadly, as encompassing:

> the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.[66]

Uncertainties surrounding methane leakage implicate the lifecycle emissions associated with eRINs. EPA must resolve these uncertainties before issuing eRINs.

EPA estimates that 109 MMT CO_2e[67] of methane are emitted from existing landfills in the U.S. every year. Ideally, a strong federal regulatory framework would exist for reducing and capturing landfill methane emissions. Unfortunately, current federal standards do not provide this strong framework for effectively capturing and utilizing the methane generated, and the Agency has yet to initiate improvements to this framework. As a result, few safeguards are in place to ensure that landfills would improve collection efficiencies and identify and fix leaks in a timely manner. Issuing eRINs without these improvements could create incentives for landfills to produce more biogas and result in more fugitive methane emissions to the atmosphere. Landfills may use

---

[63] *Growth Energy v. EPA*, 5 F.4th 1, 14 (D.C. Cir. 2021).
[64] Emily Grubert, *At scale, renewable natural gas systems could be climate intensive: the influence of methane feedstock and leakage rates*, Env't Rsch. Letters Aug. 11, 2020, at 1, https://iopscience.iop.org/article/10.1088/1748-9326/ab9335/pdf; Steph Herbstritt et al., *Rye as an Energy Cover Crop: Management, Forage Quality, and Revenue Opportunities for Feed and Bioenergy*, 12 Agric. 1691 (2022), https://doi.org/10.3390/agriculture12101691.
[65] Jan Liebetrau et al., *Analysis of greenhouse gas emissions from 10 biogas plants within the agricultural sector*, 67 Water Sci. & Tech. 1370 (2013) (included as Attachment F); Grubert, *supra* note 65.
[66] 42 U.S.C. § 7545(o)(1)(H).
[67] *Greenhouse Gas Inventory Data Explorer*, EPA, https://cfpub.epa.gov/ghgdata/inventoryexplorer/ (last visited Feb. 9, 2023).

practices such as not diverting organic waste from the facility, or recirculating leachate through the waste mass to accelerate decomposition of organics in order to generate more biogas as a result of eRINS. Several states, including California, Washington, and Oregon have begun to pass stronger regulations that fill the gaps left by the existing federal standards.[68] Implementing increased monitoring, improved maintenance programs, and stricter engineering and regulatory programs will help identify and reduce fugitive methane emissions in the future and must be established prior to issuing eRINs.

2. Environmental Justice Concerns

Biogas from agricultural and landfill sources also present environmental justice concerns. Most agricultural biogas digesters are currently located on concentrated animal feeding operations ("CAFOs"), due to economies of scale which typically require manure from at least 500 cows or 2,000 hogs for biogas recovery to be financially viable.[69] CAFOs can emit air pollutants including volatile organic compounds ("VOCs"), hydrogen sulfide, ammonia, and particulate matter ("PM").[70] Multiple studies have established that CAFOs are disproportionately located in low-income communities and communities of color.[71] These communities experience a range of adverse health issues including eye, nose, and throat irritation and disproportionately high rates of chronic respiratory problems, mental health disorders, anemia, kidney disease, low birth weight, infant mortality, and all-cause mortality.[72] While anaerobic digestion systems may ameliorate some problems like GHG emissions, they can exacerbate others like ammonia emissions. Chronic exposure to ammonia emissions can adversely affect the human respiratory system, and lead to impaired lung function and obstructive airway disease.[73] One study found anaerobic digestion systems can increase ammonia emissions by 81% when managed without manure storage covers, solid liquid separation, or other beneficial management practices.[74] Further subsidizing biogas production from CAFOs – without regulatory guardrails to ensure

---

[68] *See*, *e.g.*, Cal. Code Regs. tit. 17, §§ 95460-95476 (2010); Act effective Jun. 9, 2022, 2022 Wash. Sess. Laws ch. 179 (regulating landfill methane emissions); and Or. Admin. R. 340-239-0010 to -0800 (2021).

[69] EPA, EPA-430-R-18-006, *Market Opportunities for Biogas Recovery Systems at U.S. Livestock Facilities* (2018), https://www.epa.gov/sites/default/files/2018-06/documents/epa430r18006agstarmarketreport2018.pdf.

[70] Ruthie Lazenby, Vermont Law and Graduate School Center for Agriculture and Food Systems, *Rethinking Manure Biogas: Policy Considerations to Promote Equity and Protect the Climate and Environment* (2022), https://www.vermontlaw.edu/sites/default/files/2022-08/Rethinking_Manure_Biogas.pdf; D. Lee Miller & Ryke Longest, *Reconciling Environmental Justice with Climate Change Mitigation: A Case Study of NC Swine CAFOs,* 51 Vt. J. Env't L. 523–543 (2020), https://irp-cdn.multiscreensite.com/ee52edf5/files/uploaded/Miller_Final.pdf.

[71] Miller & Longest, *supra* note 71; Sacoby Wilson et al., *Environmental justice and the Mississippi hog industry*, 110 Env't Healthy Perspectives 195–201 (2002), https://ehp.niehs.nih.gov/doi/epdf/10.1289/ehp.02110s2195; Steve Wing et al., *Environmental justice in North Carolina's hog industry*, 108 Env't Health Perspectives 225 (2000), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637958/pdf/envhper00304-0081.pdf.

[72] Julia Kravchencko et al., *Mortality and Health Outcomes in North Carolina Communities Located in Close Proximity to Hog Concentrated Animal Feeding Operations*, 79 N.C. Med. J. 278 (2018) https://ncmedicaljournal.com/article/54963.

[73] Rana Padappayil & Judith Borget, *Ammonia Toxicity* (2022), https://www.ncbi.nlm.nih.gov/books/NBK546677/; EPA, CASRN 7664-41-7, *Toxicological Review of Ammonia Noncancer Inhalation: Executive Summary* (2016), https://iris.epa.gov/static/pdfs/0422_summary.pdf.

[74] Michael Holly et al., *Greenhouse gas and ammonia emissions from digested and separated dairy manure during storage and after land application*, 239 Agric., Ecosystems & Env't 410, 410 (2017), https://www.researchgate.net/publication/313731233_Greenhouse_gas_and_ammonia_emissions_from_digested_and_separated_dairy_manure_during_storage_and_after_land_application.

best management practices – may cause CAFOs to further expand their operations and increase herd sizes, exacerbating local pollution and health risks.[75] We therefore have concerns about eRINs because of the potential environmental justice impacts. EPA has an obligation to consider these impacts when setting volumes for a biogas-to-electricity pathway.

Similar concerns and impacts are felt by communities living near municipal solid waste facilities. Most landfills are disproportionately located near communities of color and low-income communities, and such communities are often targeted in siting of new and expanded landfills. One study in North Carolina, for example, showed that communities in which the percentage of people of color is greater than 10 percent are more likely to have municipal solid waste landfills nearby.[76] Improperly managed landfills pose risks to water quality, such as ammonia and mercury contamination.[77] Additionally, communities near landfills have been associated with elevated cancer rates, low birth weights, and birth defects.[78] Sampling from gas collection systems at municipal solid waste landfills has detected over 30 chemicals including a number of human carcinogens such as benzene and vinyl chloride.[79] These health and environmental impacts, along with other issues, such as pests, are largely and disproportionally experienced by communities that are lacking the resources to address these issues. By creating incentives for the continued landfilling of organic waste to generate biogas, the eRIN pathway will increase these risks and undermine efforts to reduce the risks by diverting organic waste away from landfills.

3. Land Use Concerns

The extent to which issuing eRINs will create economic incentives for purpose grown crops to increase biogas production, and whether those purpose grown crops will reduce or increase CI scores of the eRIN pathway, is unknown. Utilizing purpose grown crops for biogas feedstock raises potential concerns under some scenarios about the climate impact of dedicating additional land to growing these crops, as well as food security issues arising from the diversion of crops to biogas generation.

---

[75] *See*, *e.g.*, Act of Jun. 8, 2021, 2021 Iowa Acts ch. 157 (codified at Iowa Code § 459.206 (2023)) (exempting anaerobic digester facilities from Iowa's generally applicable CAFO regulations). *See* Kari Lyderson, *Biogas expansion may compound worker risks*, Energy News Network (Nov. 16, 2022), https://energynews.us/2022/11/16/biogas-expansion-may-compound-worker-risks/.

[76] *See generally* Jennifer Norton et al., *Race, Wealth, and Solid Waste Facilities in North Carolina*, 155 Env't Health Perspectives 1344 (2007), https://ehp.niehs.nih.gov/doi/epdf/10.1289/ehp.10161.

[77] Kayla Vasarhelyi, *The Hidden Damage of Landfills*, U. Colo. Boulder, Env't Ctr. Div. of Student Aff. (Apr. 15, 2021), https://www.colorado.edu/ecenter/2021/04/15/hidden-damage-landfills.

[78] Joan Casey et al., *Climate Justice and California's Methane Superemitters: Environmental Equity Assessment of Community Proximity and Exposure Intensity*, 55 Env't Sci. Tech. 14746 (2021), https://pubs.acs.org/doi/10.1021/acs.est.1c04328.

[79] Agency for Toxic Substances & Disease Registry, *Landfill Gas Primer - An Overview for Environmental Health Professionals, Appendix C: Health Studies Related to Landfill Gas Exposures* C-2 (2001), https://www.atsdr.cdc.gov/HAC/landfill/PDFs/Landfill_2001_appc.pdf.

B. Bioenergy resources and innovation should be directed towards difficult-to-decarbonize sectors.

In setting applicable volumes, EPA must analyze the impact of renewable fuels on energy security and other factors.[80] Bioenergy will better promote energy security through its use in difficult-to-decarbonize sectors, such as aviation for which high energy density carbon fuels are necessary. The Administration has highlighted the role of biofuels in these hard to decarbonize sectors in its transportation decarbonization strategy.[81]As a result, EPA should not direct valuable bioenergy resources to light-duty vehicles, which are comparatively easier to decarbonize.

C. If EPA finalizes these proposed eRIN regulations, it should only set volumes for one year and should retire the RECs.

Given these issues, if EPA decides to issue eRINs in the final rule, EPA should limit eRIN volumes to one year (EPA's proposed 2024 volumes) so that it can monitor facilities for methane leaks, resolve latent uncertainties, and reevaluate whether an eRIN pathway actually satisfies the Agency's duties under the Act. To ensure that EPA fully considers the relevant statutory factors while setting volumes— including the impact of the production and use of renewable fuels on the environment— EPA should closely monitor methane leaks from facilities producing electricity from biogas and revisit the volumes in one year based on its findings. Too much uncertainty about environmental harm exists to create volumes for two or three years currently.

The proposal permits a renewable electricity generator located in a state with a renewable portfolio standard ("RPS") to continue to generate renewable electricity credits ("RECs") for producing biogas in addition to entering into eRIN generation agreements so long as the applicable state's RPS does not place prohibitions on this activity. RECs are tradable energy commodities representing 1 MWh of electricity generation from a qualified renewable energy resource. EPA requested "comment on this proposed approach for the interaction of the eRIN program with other environmental credit programs."[82] Biogas that is diverted from the grid to EV charging should then be replaced on the grid with the same amount of energy from a renewable energy source. Thus, if EPA issues eRINs, it should ensure that the renewable electricity generator does not receive eRINs for the same electricity it generates for RECs. Otherwise, biogas will simply be rerouted and leave a gap on the grid that could be filled by fossil fuels.

VII. Conclusion

CATF appreciates this opportunity to comment on EPA's proposed RFS program standards for 2023–2025 and other changes. Biofuels will play a role in decarbonizing the transportation industry, especially in hard to electrify sectors. The RFS, however, is not an effective program for decarbonizing the transportation sector, as the program has historically resulted in the increase in fuels with high CI scores, greater negative environmental impacts, and lower climate

[80] 42 U.S.C. § 7545(o)(2)(B)(ii)(II), (VI).
[81] U.S. Dep't of Energy et al., *Blueprint*, *supra* note 1.
[82] RFS Proposed Update, 87 Fed. Reg. at 80654

benefits than Congress intended. CATF recommends that to begin to rein in this problem in the final rule EPA must limit volume requirements to one year instead of three years for all renewable fuel types. This limit will allow more time for data collection and analysis and for the Agency to incorporate more accurate science and data into the volumes to ensure climate beneficial outcomes of the program. EPA correctly identified the need to establish new pathways that incorporate CI scores, and limiting volumes to one year will allow time to enter rulemaking proposing new pathways for corn ethanol with CCS. EPA should not raise BBD volumes and instead maintain the BBD volume at the 2022 level. Finally, EPA should continue to refrain from registering parties to generate RINs from the biogas-to-electricity pathway until it can resolve uncertainties surrounding methane leakage, environmental justice risks, and harms associated with land use change.

CATF urges EPA to finalize an RFS rule that lives up to its intended goals, achieves greater reliance on truly clean fuels, and supports the Administration's transportation decarbonization strategy. This includes dedicating bioenergy to difficult-to-electrify sources to maximize its energy security benefits rather than easy to electrify sectors like the light-duty vehicle fleet.

Thank you for the opportunity to provide comments on this proposal.

Respectfully Submitted,

Clean Air Task Force

contact
Kathy Fallon,
Director,
Land & Climate Program,
Clean Air Task Force,
114 State Street, 6th Floor,
Boston, MA 02109
kfallon@catf.us

Table of Attachments

A	Jane O'Malley & Stephanie Searle, ICCT, *Air Quality Impacts of Biodiesel in the United States* (2021).
B	*Billionaire oil driller invests in Ames-based Summit's carbon-capture pipeline*, Des Moines Register (Mar. 2, 2022).
C	Erin Jordan, *How far would Iowa pipeline projects go toward U.S. climate change goals?*, The Gazette (Jan. 19, 2022, 6:00 A.M.).
D	Fabio Gaetano Santeramo & Stephanie Searle, *Linking Soy Oil Demand from the US Renewable Fuel Standard to Palm Oil Expansion through an Analysis on Vegetable Oil Price Elasticities*, 127 Energy Policy 19 (2019).
E	Yogeeswari Subramaniam et al., *The impact of biofuels on Food Security*, 160 Int'l Econ. 72 (2019).
F	Jan Liebetrau et al., *Analysis of greenhouse gas emissions from 10 biogas plants within the agricultural sector*, 67 Water Sci. & Tech. 1370 (2013)