



March 6, 2023

Attention: Docket ID No. EPA-HQ-ORD-2020-0682

The Honorable Michael Regan
Administrator
U.S. Environmental Protection Agency
EPA Docket Center
Office of Air and Radiation Docket
Mail Code 28221T
1200 Pennsylvania Ave NW
Washington, DC 20460

Via: www.regulations.gov

Re: Comments on *Biofuels and the Environment: Third Triennial Report to Congress (External Review Draft)* (88 Fed. Reg. 72; January 3, 2023).

Dear Administrator Regan,

The Renewable Fuels Association (RFA) appreciates the opportunity to submit these comments regarding the U.S. Environmental Protection Agency's (EPA) external review draft of *Biofuels and the Environment: Third Triennial Report to Congress* (88 Fed. Reg. 72; January 3, 2023).

RFA is the leading trade association for America's ethanol industry. Its mission is to drive expanded demand for American-made renewable fuels and bioproducts worldwide. Founded in 1981, RFA serves as the premier organization for industry leaders and supporters. With over 300 members, we work every day to help America become cleaner, safer, and more economically vibrant.

The RFS has been a tremendous success. It has bolstered energy security by reducing demand for petroleum imports; it has reduced greenhouse gas emissions by replacing petroleum with low-carbon, renewable alternatives; it has lowered fuel prices for American consumers; and it has created jobs and spurred economic development across the country. Of particular relevance for the triennial report, ethanol's environmental benefits beyond reducing GHG emissions have been highly positive on balance.

RFA appreciates the substantial amount of work that EPA staff and other contributors dedicated to developing the draft report. However, there are several issues that the Agency should address before finalizing it. These are discussed in the attached comments.

Thank you again for the opportunity to provide these comments, and please do not hesitate to contact me should you have questions.

Sincerely,

A handwritten signature in black ink that reads "Geoff Cooper". The signature is written in a cursive, flowing style.

Geoff Cooper
President & CEO

**COMMENTS OF THE
RENEWABLE FUELS ASSOCIATION (RFA)
IN RESPONSE TO
BIOFUELS AND THE ENVIRONMENT: THIRD TRIENNIAL REPORT TO CONGRESS
(EXTERNAL REVIEW DRAFT)
DOCKET ID No. EPA-HQ-ORD-2020-0682
88 FED. REG. 72 (JANUARY 3, 2023)**

The Renewable Fuels Association (RFA) submits these comments in response to the U.S. Environmental Protection Agency's (EPA) *Biofuels and the Environment: Third Triennial Report to Congress (External Review Draft)* (88 Fed. Reg. 72; January 3, 2023).

Overall, a considerable amount of research is reflected in the external review draft report, and RFA appreciates the substantial amount of work that EPA staff and other contributors dedicated to the publication. However, there are several issues that the Agency should address before finalizing the report.

I. The attribution analysis is incomplete.

RFA commends EPA for its efforts to separate the effects of the Renewable Fuel Standard (RFS) on environmental outcomes from the effects of the overall production and use of biofuels. Numerous studies that purport to assess the impacts of the RFS actually consider overall volumes, which as EPA notes have also been driven by other federal and state policies as well as a number of market factors. Additionally, in the case of ethanol, commercial-scale production existed and expanded for more than two decades before the legislation establishing the RFS was enacted.

However, it is unfortunate that EPA provided a quantitative estimate only for corn ethanol volumes attributable to the RFS. This results in uneven treatment of different biofuels and an incomplete picture of the effects of the RFS.

II. The temporal focus of the triennial report needs to be modified.

Section 204 of the Energy Independence and Security Act of 2007 (EISA) states that the EPA "shall assess and report to Congress on the impacts to date and likely future impacts of the requirements" of the RFS. (EISA, 2007) The Agency indicated in the draft of the Third Triennial Report to Congress on Biofuels (RtC3) that it interprets EISA "to include both the requirements of the Program from 2005 through 2008 under the EPAct [the Energy

Policy Act of 2005] (RFS1), as well as the requirements of the RFS Program as modified by EISA from 2009 to present day (RFS2).” (U.S. EPA, 2022) However, EISA did not specify how much emphasis to give to different portions of the time period since the RFS was implemented.

As EPA observes in RtC3, “The period of rapid growth in the ethanol industry was from 2002 to 2010, and nearly 40% of the increase in ethanol consumption had already occurred by 2006 (the first year of the RFS Program, RFS1), and over 90% of the increase had already occurred by 2010 (the first year of the RFS2).” (U.S. EPA, 2022) Yet, the “report concludes that the RFS Program itself likely played a relatively minor role (0-0.4 billion gallons per year) in the growth of corn ethanol in the U.S. from 2002-2012.”

Given EPA’s conclusion that the RFS played a “minor role” for ethanol through 2012 and the fact that EPA published its Second Triennial Report to Congress (RtC2) in 2018, which extensively addressed historical environmental impacts, the Agency’s continued focus in RtC3 on the early years of the program is disproportionate. With respect to corn ethanol, RtC3 should focus mostly on any environmental impacts that have occurred over the last five years (since RtC2) or that are likely to occur in the future. For the future, it would be reasonable for EPA to address the 2023-2025 period for which it recently proposed RFS renewable volume obligations.

III. EPA’s analysis of land cover and land management should be refined.

In discussing its approach to the historical assessment, EPA states, “With respect to ‘impacts to date,’ the period beginning in roughly 2000-2005 up to about 2020 is considered.” (U.S. EPA, 2022) However, the Agency does not conform to this timeframe in Chapter 5 Domestic Land Cover and Land Management:

- Most of the major national studies on land use change from RtC2 that were recapped in Table 5.1 start in 2007;
- EPA developed an estimate of the “increase in cultivated cropland post-2007” based on the National Resources Inventory (NRI), Census of Agriculture, Major Land Uses (MLU) data set, and Cropland Data Layer (CDL); and
- The research by Lark *et al.* that is cited numerous times starts in 2008.

Yet, as shown in Figures 5.2 and 5.3 of RtC3, total cropland declined from 2002 to 2017 according to both the NRI and Census, and cultivated cropland increased by only 1.0 million acres, or 0.3%. At the end of the chapter, EPA recommends, “Estimates of LCLM [land cover and land management] trends for policy decisions in the lower 48 states should preferentially be based on the NRI, complemented by continuous annual survey data such as [the U.S. Department of Agriculture’s National Agricultural Statistics Service].”

Additionally, the Agency conducted an analysis of LCLM, for which USDA separated the total cropland category in the NRI into four requested subcategories: corn, soybean, other cultivated cropland, and noncultivated cropland. EPA then combined corn and soybeans into a single category for purposes of evaluating transitions among categories.

However, this reaggregation decreases the level of detail that can be achieved through an analysis of the data, and it masks the divergent trajectories of corn and soybean acreage over the last decade.

The area planted to corn reached a recent peak in 2012—the highest acreage since the 1930s—after a period of increasing consumption and two years of severe regional droughts. Over the last five years (2018-2022), the area planted to corn has been 7.1 million acres below that level on average, while soybean area has been 7.5 million acres higher. It is notable that a key driver of the increase in soybean acreage has been massive import demand by China, which is unrelated to biofuels. Since EPA conducted a quantitative attribution analysis only for corn ethanol and concluded that the RFS likely played a “minor role” in the expansion of ethanol volumes through 2012, analyzing corn separately would be more appropriate.

Additionally, EPA also gave insufficient consideration to the role of urbanization in driving conversion of other land to cropland, even though it has been a major cause of the loss of cropland over time. One of the few references to urbanization or land development in RtC3 occurred in EPA’s discussion of its analysis of NRI data, when it indicated that “[o]n a net basis and amounting to roughly 5 million acres from 2002 to 2017,” corn and soybean area, land from the Conservation Reserve Program (CRP), other cultivated cropland, and noncultivated cropland were converted to an “all other” LCLM category that encompassed developed urban and rural land, forestland, and water area/federal land. By comparison, the Agency estimated “the RFS Program’s effect on corn ethanol production and consumption resulted in up to approximately 1.9 million acres of additional cropland between 2005 and 2016, and up to approximately 3.5 million acres of additional corn, with many years of no effect.” (U.S. EPA, 2022) The lack of sufficient consideration of urbanization is a notable omission in RtC3 and particularly the work by Lark *et al.* that is cited numerous times.

IV. The triennial report is over-reliant on research by Lark *et al.*

The draft report is exceedingly over-reliant on work by Tyler Lark and associated researchers. The term “Lark *et al.*” appears at least 65 times in the report, not including footnotes. Additionally, he was a coauthor on other papers that were cited numerous times. However, the methods used in the 2022 study by Lark *et al.* have been critiqued or refuted by the USDA; researchers from Argonne National Laboratory (Argonne), Purdue University and the University of Illinois system; and even the EPA itself.

In RtC3, EPA noted shortcomings in the study’s attribution of increases in corn ethanol production to the RFS, stating that the estimates are “above the range of estimates from the broader literature reviewed in Chapter 4 that account for the effect from oil price (0-5 billion gallons). They are also higher than other studies that include other relevant factors because of several assumptions in the underlying economic model (Carter et al., 2017) that increase the estimated effect of the RFS Program.”

In a technical memorandum submitted to the docket for EPA's proposed *Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes*, USDA identified "major methodological flaws." These included:

- "Failure to account for cropland-to-cropland conversions that would occur from the increase in corn ethanol demand. This could include, for instance, the transition of land that is moving in-and-out of other row crops into corn production.
- The (mis)classification of CRP land as native or longer-term grasslands."

USDA ended by saying, "[O]ur review concludes that the Lark et al. 2022 significantly overestimated soil carbon losses associated with biofuel production and did not clearly demonstrate a link to the RFS." (USDA, 2022)

The experts from Argonne, Purdue and the University of Illinois system cited numerous flaws, including but not limited to:

- Issues with land conversion estimates:
 - "To evaluate land use changes Lark et al. concentrated on land conversion between pasture and cropland and between CRP land and cropland. ... [A]lmost all of the estimated regional transitions between cropland and pasture land are statistically insignificant. Hence, they build their analyses on the statistically insignificant assessments of land transitions between cropland and pasture land."
 - "Lark et al. ignored a number of important transitions. ... Disregarding these transitions leads to an overestimation of [indirect land use change] for biofuels in general."
 - "The frequent rotations between cropland and managed pastureland should not be interpreted as conversion of natural land to cropland, as Lark et al. misstated and misused in their analysis." "Lark et al. incorrectly interpreted the land transition between these two land categories as transition between natural pasture to cropland with unjustifiable land use emissions."
- Specific methodological problems with the combined use of the NRI and CDL in an attempt by Lark *et al.* to identify areas of land that might have undergone change:
 - "[U]sing both CDL and NRI data is a questionable practice, as these two data sets follow different definitions, protocols, and approaches."
 - "[T]he CDL data set determines land types with a large margin of error."
 - "[T]he use of CDL data in determining the location of converted land and their characteristics at the grid cell level can lead to overestimation of GHG emissions of ethanol."
- Other modeling issues:
 - "Lark et al. significantly overestimated the land use implications of ethanol production because of ... miscalculated replacement of corn and soymeal by

[distillers grains], an assumed yield improvement close to zero, and overlooked reduction in demand due to higher crop prices.” “[I]ncorporating these effects ... leads to [estimates that are] a small fraction of the estimated land use changes by Lark et al.” (Taheripour, et al., 2022)

Additionally, in RtC3 EPA repeatedly cited and included graphics from a 2020 study by Lark *et al.* that, like most of his work, was based on the CDL. Lark *et al.* claim that “native” grassland with high carbon storage has been converted to corn production, but their use of satellite imagery to determine what types of land were converted has been shown to be fundamentally flawed. USDA has warned, “Unfortunately, the pasture and grass-related land cover categories have traditionally had very low classification accuracy in the CDL.” (USDA, 2021) In RtC3, EPA appears to acknowledge this, stating, “Improvements in the skill of satellite-derived data to successfully characterize grassy habitats remains an urgent need (e.g., grassland, pasture, CRP).” EPA goes on to say, “Estimates of LCLM trends for policy decisions in the lower 48 states should preferentially be based on the NRI, complemented by continuous annual survey data such as NASS.”

In light of this, EPA should make more selective use of research by Lark *et al.* and review critiques of their methods, in order to determine which findings withstand scrutiny.

V. For the assessment of future impacts, EPA’s assumptions regarding corn ethanol production need to be adjusted.

In looking at the future impacts of corn ethanol, EPA considered production volumes between 15.3 and 16.7 billion gallons in 2025. The high end of that range is unrealistic and is significantly above the Energy Information Administration (EIA) and USDA forecasts on which it was based.

Record production of 16.1 billion gallons occurred in 2018, and since then production has been 15.8 billion gallons or less, with 2022 output estimated by EIA at 15.4 billion gallons. Additionally, the focus of the analysis should be on domestic consumption—specifically the portion driven by the RFS—including continued growth in gasoline blends containing more than 10% ethanol (E10). Rather than using outdated forecasts by EIA and USDA, the assumed trajectories for ethanol and other biofuels in RtC3 should be consistent with volumes contained in the EPA’s proposed rule establishing the RFS renewable volume obligations for 2023-2025, also referred to as the “Set” rule proposal.

VI. Air quality impacts.

Starting in 2007, the U.S. Department of Energy (DOE) undertook a test program to evaluate the effects of mid-level ethanol blends on vehicle and fuel parameters. The research found that carbon monoxide emissions were lower for E15 than ethanol-free gasoline (E0), while nitrogen oxide (NOx) and non-methane hydrocarbon (NMHC) emissions were not significantly different. (West, Sluder, Knoll, Orban, & Feng, 2012)

In 2016, a literature review indicated that the use of ethanol reduces emissions of toxic compounds and is advantageous for both short- and long-term NO_x emissions, and it noted that “many studies have shown the beneficial effects of ethanol blending on fuel [particulate matter] emissions.” (Sobhani, 2016) The report concluded, “When blended into gasoline, ethanol increases the octane rating of the fuel enabling higher efficiency engines and is shown to decrease the emissions of several harmful pollutants.”

In addition, an emissions testing study by the University of California-Riverside released in 2022 showed that replacing E10 with E15 results in statistically significant reductions in the emissions of particulate matter, carbon monoxide, NMHC, total hydrocarbons, and other harmful emissions. (Karavalakis, Durbin, & Tang, 2022)

VII. The peer review meeting did not result in consensus or clarity on material changes to EPA’s final report.

The peer review meeting that was held February 24-28 was extremely wide-ranging and generally did not reflect a consensus on the specific topics addressed in RtC3. Comments from peer reviewers often reflected divergent perspectives, subjective statements, and disagreement on the need for further changes to EPA’s final report. At times, the meeting appeared to be more of an opportunity for participants to air personal opinions about biofuels than a peer review of the analysis contained in RtC3. Comments are merited on some specific statements that were made:

- Consistent with RFA’s comments above, some of the participants indicated that reviews and criticism about the work by Lark *et al.* should be explicitly included in RtC3. Stephen Kaffka of the University of California, Davis stated that EPA should conduct “an independent and thorough review” of the work if the Agency is going to rely on it in RtC3. RFA agrees with this comment.
- In a related manner, Bernard Engel of Purdue commented that researchers are “nowhere near” having sufficient data to do spatially explicit analysis around many of the environmental impacts addressed in the report, and EPA “needs to be cautious” about how such findings are used. RFA strongly agrees with this comment.
- Aaron Smith of the University of California, Davis stated that with regard to any land use change resulting from ethanol, “all of the action was in 2006-2007.” He was a co-author of the 2022 paper by Lark *et al.*, and in response to criticism of the attribution of ethanol volumes in that analysis, he suggested that their findings regarding environmental impacts could simply be converted to a per-gallon basis and multiplied by whatever volume EPA chose to attribute to the RFS. He also indicated this approach could be used to estimate future impacts of the RFS. However, this wouldn’t address fundamental flaws that undermine claims by Lark *et al.* about environmental impacts, and the future effects of corn ethanol will not likely be same as those in the past—especially those that are claimed to have occurred 15+ years ago.

- Certain reviewers indicated that in EPA’s attribution analysis, the Agency should try to go further in quantifying the impact of RFS on decisions to invest in biofuel production facilities and infrastructure. However, as was noted by Smith, such an analysis could be “technical and challenging.” It also risks being highly subjective rather than quantitative—particularly in the case of corn ethanol, for which the capacity build-out largely took place more than a decade ago, and was driven by a number of complex factors.

Finally, a peer review is supposed to be objective and focus on the science, but comments by certain participants raised questions about their objectivity. For example, in discussing the issue of biofuels growth being promoted by both the RFS and other policies, Jason Hill of the University of Minnesota quipped, “You can have two suspects who are each charged with murder.” This statement demonstrates the obvious personal bias and ideology of Dr. Hill, and it has no place in a science-based, objective peer review process. Further, at the conclusion of the meeting, Harry de Gorter of Cornell University made the blanket statement, “If the RFS has such little effect, why can’t we recommend they scrap it?” Such comments reflect contempt for biofuels and the RFS and go far afield from reviewing EPA’s analysis of the program’s environmental effects.

As the Agency considers revising RtC3, it is worth highlighting a comment made by Dr. Kaffka: the EPA has a responsibility to be cautious since the report is going to Congress.

VIII. Conclusion

RFA appreciates the opportunity to submit these comments in response to the external review draft of *Biofuels and the Environment: Third Triennial Report to Congress*. We urge EPA to take them into consideration as it finalizes the report.

VIII. References

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