April 25, 2022

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Lacey, WA 98503

RE: Washington Clean Fuels Program Rule

The Renewable Fuels Association (RFA) thanks you for the opportunity to provide comments for the Informal Public Comment Period for Chapter 173-424 WAC, Clean Fuels Program Rule**.**

The RFA is the leading national trade association representing U.S. fuel ethanol producers. Its mission is to advance the development, production, and use of low-carbon fuel ethanol by strengthening America's ethanol industry and raising awareness about the benefits of renewable fuels. Founded in 1981, RFA serves as the premier forum for industry leaders and supporters to discuss ethanol policy, regulation, and technical issues. RFA's 300-plus members are working daily to help America become cleaner, safer, more energy secure, and economically vibrant.

The RFA is an enthusiastic supporter of the Washington Clean Fuels program. We also are working around the country in collaboration with other stakeholders to implement similar programs in other states. The following comments offer RFA's perspective on the program design to date.

- **RFA supports a 20% reduction of carbon intensity targets by 2034**.

This goal is achievable and necessary given our climate crisis. This attainable target sends the appropriate longer term market signal for innovation and investment. The RFA membership is committed to producing ethanol at net zero full life cycle GHG emissions no later than 2050 and will be active participants in helping the State of Washington meet the Clean Fuel Program goals.

- **The integrity of the Clean Fuels Program depends on technology neutrality.**

The key to success of a Clean Fuels Program is its market-based technology neutral approach that is driven by the carbon intensity scores of all fuels whether generating credits or deficits. Consistent adherence to the principle of technology neutrality ensures broad support for the program going forward. Achieving the goals of the Clean Fuels Program will require a broad portfolio of low and zero carbon fuel solutions. Any new policies that are introduced to incentivize new innovations and technology development should be available to all low carbon fuels.

- **RFA supports using Argonne GREET as the basis for indirect and direct emissions**.

RFA has enthusiastically supported low-carbon fuel programs that use fair, consistent, and scientifically robust methods for evaluating the lifecycle carbon intensity (CI) of all transportation fuel options. The Argonne GREET model is widely accepted as the gold standard for full life cycle analysis of the GHG emissions from transportation fuels. Argonne updates its model regularly (typically on an annual basis) to incorporate the best science on all variables.

A critical aspect of a program's ability to meet these criteria is whether and how it incorporates theoretical greenhouse gas (GHG) emissions from indirect land use change (ILUC). Although estimates of ILUC-related emissions have been reduced significantly over the last decade, there remains substantial uncertainty inherent in the methods used to quantify them.

Although we believe that indirect effects should be excluded from low-carbon fuel programs until there is scientific agreement on methodology, considering all the research that has been conducted, the ILUC estimate incorporated into the GREET model is the best available. Given that the ILUC value used for Oregon's Clean Fuels Program is similar in magnitude to the GREET estimate and that the two states are adjoining, the recommendation by Life Cycle Associates that Washington adopt the same value of 7.6 g CO_2e/MJ is appropriate.

Attached to this letter is a more detailed review from RFA in support of the analysis by Life Cycle Associates prepared for the Department of Ecology recommending an ILUC value of 7.6 gCO_2e/MJ for corn ethanol.

- **The use of Book and Claim accounting should be expanded.**

Consistent with technology neutrality, book and claim accounting should be allowed in the production of all low carbon fuels utilizing the offsite production of renewable electricity and renewable natural gas for onsite process energy.

- **RFA strongly supports incorporating site specific agricultural inputs into fuel pathways**.

A significant portion (roughly half) of the full life cycle carbon intensity of ethanol is from the agricultural production of the feedstocks. With the increasing employment of no till, cover cropping, and other modern precision agricultural practices, farmers have quantified the ability to significantly lower the carbon intensity of feedstock production while also increasing soil carbon levels. Providing site specific input analysis will further incentivize these carbon efficient agricultural practices, resulting in lower carbon ethanol production and contributing to a more successful Clean Fuels Program.

The RFA looks forward to continued engagement with the Department of Ecology and other stakeholders in developing and implementing a successful Clean Fuels Program for the State of Washington.

Sincerely,

Kelly Davis
VP of Regulatory Affairs

RENEWABLE FUELS ASSOCIATION

April 25, 2022

RFA Review of iLUC Considerations in Development of Washington Clean Fuels Program

While indirect land use change (ILUC) remains a hypothetical concept, the most scientifically robust model-derived estimates of corn ethanol ILUC emissions are integrated into the Greenhouse gases, Regulated Emissions, and Energy use in Technologies (GREET) model developed by the Department of Energy's Argonne National Laboratory, which is considered the gold standard for estimating the greenhouse gas (GHG) emissions from transportation fuels. The Carbon Calculator for Land Use Change from Biofuels Production (CCLUB) is used to estimate ILUC emissions within the GREET/CCLUB/Global Trade Analysis Project (GTAP-BIO) modeling array. The use of CCLUB within this array has advantages over other approaches since CCLUB's LUC estimates are taken from the latest version of Purdue University's GTAP model and its emission factors are based on actual field measurements incorporated into the CENTURY/DAYCENT tools for measuring site-level carbon fluxes.

Based on these enhancements, the latest version of GREET/GTAP/CCLUB estimates that ILUC emissions from corn ethanol are approximately 5.4 grams of carbon dioxide equivalent per megajoule (g CO2e/MJ), while total emissions from LUC (including domestic LUC) are 7.4 g CO2e/MJ.

As researchers from Argonne explained in a 2021 study, "The LUC GHG emissions from large-scale corn production for corn ethanol have been simulated since 2008. Early studies showed extremely high LUC emissions (*e.g.*, Searchinger et al.), and recent studies show significantly lower LUC emissions. The downtrend in simulated LUC emissions is a result of better developed and calibrated economic models and better modeling of GHG emissions from LUC. Economic models such as [GTAP-BIO] are much improved in addressing land intensification (i.e., existing lands are managed to be more productive) versus land extensification (i.e., croplands extend into new areas of pasture and forest), crop yield increases over time, crop yield differentials in existing croplands and in newly cultivated croplands, double cropping in regions such as Asia, availability and restriction of certain land conversions (e.g., restriction of public forest land for conversion to croplands), price elasticities for crop yield responses, and food demand responses to price changes."[1]

In a report prepared for the Washington Department of Ecology, Life Cycle Associates recommended that an ILUC value of 7.6 g CO2e/MJ be adopted for corn ethanol under the

[1] Lee, U., Kwon, H., Wu, M. & Wang, M. (2021). Retrospective Analysis of the U.S. Corn Ethanol Industry for 2005 – 2019: Implications for Greenhouse Gas Emission Reductions. *Biofuels, Bioprod. Bioref.* https://doi.org/10.1002/bbb.2225

Clean Fuel Standard (CFS), which would be consistent with the Oregon Clean Fuels Program and is similar in magnitude to the GREET estimate.

The International Council on Clean Transportation (ICCT) conducted a "peer review" of materials developed by Life Cycle Associates, including the report on ILUC. The ILUC recommendation was singled out for particular scrutiny, and ICCT's criticisms of the GTAP-BIO and CCLUB models underlying the Oregon ILUC value largely track those in a 2020 paper by Malins *et al.* that is cited at least a half-dozen times.[2] Perhaps this is not surprising since Stephanie Searle of ICCT has coauthored several papers with Malins, including one that critiqued GTAP and CCLUB.[3]

A detailed response to the 2020 paper by Malins *et al.,* which also addressed references to the paper by Searle and Malins, was published by leading researchers involved in the development of GTAP-BIO and CCLUB.[4] Rather than repeating their rebuttal to the criticisms here, the RFA would refer the Department of Ecology to that response as it considers what ILUC value is appropriate for the CFS.

It is worth noting that the authors ended by saying, "The existing literature has reached the conclusion that early research in this area significantly overstated the land use implications of biofuels. Following early overstated projections for ILUC—which are in sharp conflict with actual observations and were estimated from improper modeling practices and/or hypothetical biased assumptions inconsistent with actual observations—will diminish our capability to effectively reduce GHG emissions using agricultural resources."

The ICCT recommended that Washington adopt the ILUC value used for the California Low Carbon Fuel Standard (LCFS) rather than the one for Oregon's program, However, the California estimate was developed in 2014 and does not reflect updates to models (including GTAP-BIO) and data that have occurred since then.

Additionally, California's ILUC factor was based on the predicted land use effects of expanding national corn ethanol production from 2004 levels to 15 billion gallons (i.e., current levels). In other words, the California Air Resources Board's (CARB) analysis penalizes current biofuels for hypothetical ILUC emissions that might or might not have actually occurred in the past as ethanol production expanded to this level. Thus, the CARB ILUC factor did not reflect the

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[2] Malins, C., Plevin, R. & Edwards, R. (2020). How Robust Are Reductions in Modeled Estimates from GTAP-BIO of the Indirect Land Use Change Induced by Conventional Biofuels? *J. Clean. Prod., 258,* 120716. https://doi.org/10.1016/j.jclepro.2020.120716

[3] Searle, S., & Malins, C. (2016). *A Critique of Soil Carbon Assumptions Used in ILUC Modeling* (Working Paper 2016-13). International Council on Clean Transportation. https://theicct.org/sites/default/files/publications/ICCT_soil-carbon-assumptions-ILUC_20160613.pdf

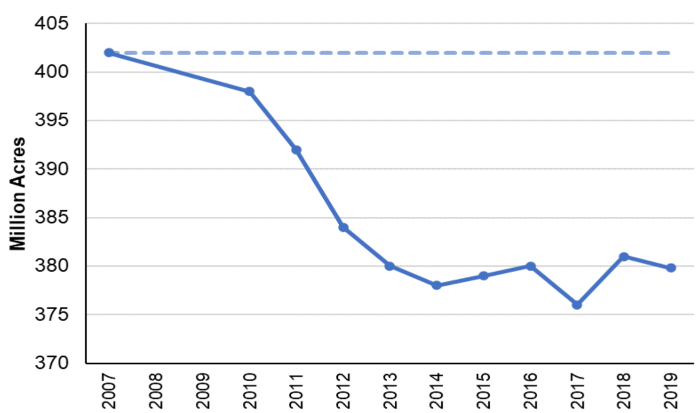
[4] Taheripour, F., Mueller, S., & Kwon, H. (2021). Response to "How Robust Are Reductions in Modeled Estimates from GTAP-BIO of the Indirect Land Use Change Induced by Conventional Biofuels?" *J. Clean. Prod.*, *310,* 127431. https://doi.org/10.1016/j.jclepro.2021.127431

expected land use emissions of specifically implementing the re-adopted California LCFS starting in 2016, and it certainly does not simulate the land use effects of implementing the Washington CFS in the future.

In reality, U.S. ethanol production peaked in 2018 and slumped in 2020 and 2021 as a result of the COVID-19 pandemic, and the U.S. Energy Information Administration forecasts that production will only be 1% above the 2018 level in 2030 and 4% higher in 2035.[5] The increase is actually due to the expectation that exports will increase, as domestic consumption in 2030 and 2035 is forecast to be less than occurred in 2018 and 2019, since overall gasoline consumption is projected to decline. Accordingly, it is illogical to suggest that implementation of the CFS would induce additional corn ethanol ILUC emissions. If the purpose of including ILUC in the CFS program is to account for any potential unintended environmental impacts of the policy, adopting the CARB ILUC factors is plainly the wrong approach.

The concept of land use change should also be considered in the context of empirical data. When the Environmental Protection Agency (EPA) initially implemented the Renewable Fuel Standard, as amended by the Energy Policy Act of 2007 (EISA), it estimated that 402 million acres of U.S. agricultural land were available for production of crops and crop residue in 2007 that would meet EISA's definition of renewable biomass. This encompassed total cropland, pastureland, and Conservation Reserve Program land. The agency conducts annual assessments to ensure this number of acres is not exceeded, which clearly show that U.S. agricultural land has receded since passage of EISA. In recent years, it has been 20-25 million acres (5-6%) lower than in 2007 (Exhibit 1).[6]

Exhibit 1: U.S. Agricultural Land Area



Source: EPA

[5] U.S. Energy Information Administration. (2022). *Annual Energy Outlook 2022.* https://www.eia.gov/outlooks/aeo/index.php

[6] Data for 2020 and 2021 have not yet been published by EPA.

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Finally, it is worth noting that a recent paper by Lark et al., "Environmental outcomes of the US Renewable Fuel Standard,"[7] which makes allegations about GHG emissions related to land use change, has been refuted thoroughly by the Renewable Fuels Association[8] and a separate group of experts from Argonne, Purdue University, and the University of Illinois system.[9] The latter group determined, "After a detailed technical review of the modeling practices and data used by Lark et al., we conclude that the results and conclusions provided by the authors are based on several questionable assumptions and a simple modeling approach that has resulted in overestimation of the GHG emissions of corn ethanol." Rather than detailing the rebuttals here, we would refer the Department of Ecology to those documents.

In summary, considering all of the research that has been conducted, the ILUC estimate incorporated into the GREET model is the best available. Given that the ILUC value used for Oregon's Clean Fuels Program is similar in magnitude to the GREET estimate and that the two states are adjoining, the recommendation by Life Cycle Associates that Washington adopt the same value of 7.6 g CO2e/MJ is appropriate.

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[7] Lark, T. J., Hendricks, N. P., Smith, A., Pates, N., Spawn-Lee, S. A., Bougie, M., Booth, E. G., Kucharik, C. J., & Gibbs, H. K. (2022). Environmental Outcomes of the US Renewable Fuel Standard. *Proceedings of the National Academy of Sciences*. https://doi.org/10.1073/pnas.2101084119

[8] Renewable Fuels Association. (2022). Rebuttal to the Lark et al. Report "Environmental Outcomes of the US Renewable Fuel Standard." https://ethanolrfa.org/file/2191/RFA%20Rebuttal%20to%20Lark%20et%20al%20PNAS%20Report%20FINAL.pdf

[9] Taheripour, F., Mueller, S., Kwon, H., Khanna, M., Emery, I., Copenhaver, K., & Wang, M. (2022). *Comments on "Environmental Outcomes of the US Renewable Fuel Standard."* https://greet.es.anl.gov/publication-comment_environ_outcomes_us_rfs