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America's Ethanol Supporters

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November 4, 2022

The Honorable Janet Yellen
Secretary
U.S. Department of the Treasury
1500 Pennsylvania Avenue, NW
Washington, D.C. 20220

Re: Implementation of Sustainable Aviation Fuel and Clean Fuel Production Tax Credits

Dear Secretary Yellen,

I write on behalf of Growth Energy to support the adoption of the U.S. Department of Energy's Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies (GREET) model as a methodology for calculating 40B and 45Z tax credits for sustainable aviation fuel (SAF) produced using ethanol, as required by the Inflation Reduction Act of 2022 (IRA). Growth Energy is the leading association of ethanol producers in the country, with 90 bioprocessing plant producers and 106 innovative businesses that support biofuel production. We view U.S. leadership in the global SAF market to be vital to the decarbonization and future economic competitiveness of the U.S. aviation sector, and a number of our members have already made substantial investments in SAF production.

We applaud passage of the IRA as a significant step in supporting early growth of the U.S. SAF industry through the 40B Sustainable Aviation Fuel Credit and 45Z Clean Fuel Production Credit. We further applaud the Administration's SAF Grand Challenge, including its pledge to reach 3 billion gallons of American SAF production per year by 2030 and 35 billion gallons per year by 2050. Harnessing the U.S. ethanol industry—which at 17.4 billion gallons per year accounts for over 80% of biofuels production capacity in the U.S.[1]—will be necessary to achieve these goals because ethanol is one of the few readily available feedstocks for SAF production.

The Department of Treasury (Treasury) plays a critical role in implementing the IRA by ensuring the best available science is used to calculate greenhouse gas (GHG) emissions reductions associated with SAF. Specifically, the IRA ties both eligibility for and amount of the 40B and 45Z tax credits to a fuels' lifecycle GHG emissions, as determined through a lifecycle analysis (LCA). Accurate, complete, and consistent LCA measurement therefore is central to the effectiveness of the IRA.

[1] U.S. Energy Information Administration, *2022 Fuel Ethanol Production Capacity*.

The U.S. has the largest and most developed biofuels industry in the world.[2] As a result, government scientists and academics have been closely studying biofuels production for decades, and have developed the model that is widely recognized as the "gold standard" in LCA science: GREET.[3] As explained in detail below, Treasury must allow ethanol-to-jet (ETJ) producers to use GREET as a qualifying alternative methodology for determining the fuel's lifecycle GHG emissions. That is because the GREET model, which accounts for complete lifecycle emissions, meets the statutory criteria under the Clean Air Act's (CAA) definition of "lifecycle greenhouse gas emissions" referenced in the IRA and sole reliance on the model mentioned in the statute as an option (CORSIA) would not yield as credible results. 26 U.S.C. § 40B(e)(2); *id.* § 45Z(b)(1)(B)(iii)(II). In addition, Treasury must ensure that producers can receive enhanced 40B and 45Z credits based on all GHG reduction practices across their fuel's complete lifecycle, in order to incentivize lower-carbon practices and meet the IRA's carbon-reduction goals.

The Treasury Department's implementation of the 40B and 45Z tax credits must rely on accurate and complete GHG lifecycle emissions accounting to determine credit eligibility and amount.

Starting January 1, 2023, the IRA establishes a $1.25/gallon SAF credit for fuels that have a "lifecycle greenhouse gas emissions reduction percentage of at least 50 percent" as compared to petroleum-based jet fuel. 26 U.S.C. § 40B(d)(1)(D). The value of this credit can be increased by $.01/gallon for each additional percentage of GHG reduction beyond 50 percent. *Id.* § 40B(b). Then, once the 40B SAF credit expires at the end of 2024, producers of aviation fuels with an emissions rate of less than 50kg CO2e/mmBTU may qualify for the 45Z Clean Fuel Production Credit. 26 U.S.C. § 45Z(d)(5)(A)(2). Like the 40B credit, the value of the 45Z credit also increases as a fuel's emissions rate drops below the threshold value. 26 U.S.C. § 45Z(a)(1). Thus, the 40B and 45Z tax credits incentivize lower carbon intensity production of SAF and other transportation fuels. For these incentives to function properly, it is essential that a fuels' lifecycle GHG emissions be calculated accurately, completely, and in accordance with the best available science.

The 40B and 45Z tax credit provisions both prescribe two options for calculating a fuel's lifecycle emissions. First, a producer could use "the most recent Carbon Offsetting and Reduction Scheme for International Aviation [CORSIA] which has been adopted by the International Civil Aviation Organization [ICAO]." 26 U.S.C. § 40B(e)(1); *id.* § 45Z(b)(1)(B)(iii)(I). Alternatively, producers may use "any similar methodology" which "satisfies the criteria under section 211(o)(1)(H) of the Clean Air Act." 26 U.S.C. § 40B(e)(2); *Id.* § 45Z(b)(1)(B)(iii)(II). The GREET model developed by the U.S. Department of Energy's Argonne National Laboratory is undeniably a similar methodology that satisfies those criteria. For the reasons explained below, Treasury must allow ETJ producers to use GREET in determining the fuel's lifecycle GHG emissions.

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[2] *See, e.g.* U.S. Energy Information Administration, *International Biofuels Production*.

[3] *See, e.g. Upstream Energy Analysis*, Argonne National Laboratory (Sep. 27, 2022) https://www.anl.gov/esia/upstream-energy-analysis (noting that GREET is "the gold standard for evaluating energy emissions and impacts").

GREET is a "similar methodology" to CORSIA. Both models calculate fuels' well-to-wheel GHG emissions through an attributional lifecycle analysis of "core" process-based emissions (i.e., emissions from a biofuels production facility or feedstock production) combined with a consequential lifecycle analysis for indirect or induced emissions (i.e., land use change). *CORSIA Eligible Fuels – Life Cycle Assessment Methodology* (June 2019) at 10. CORSIA explicitly adopts GREET values for several of its inputs, including corn grain cultivation and harvest, transportation to the fuel production facility, and jet fuel transportation and distribution. *Id.* at 41. As a result, the CORSIA default value for ETJ core emissions varies from GREET by only 0.1 gCO2e/MJ. *Id.* at 41. The larger difference in total emissions between CORSIA and GREET comes nearly entirely from CORSIA's overestimation of a single input—induced land use change or "iLUC"—as discussed further below.

GREET satisfies the criteria for lifecycle analysis under Clean Air Act (CAA) § 211(o). "Lifecycle greenhouse gas emissions" under the CAA's Renewable Fuels Standard (RFS) must consider the "aggregate quantity of greenhouse gas emissions" including "direct emissions and significant indirect emissions" for the "full fuel lifecycle." 42 U.S. Code § 7545(o)(1)(h). GREET, which comprehensively addresses direct emissions as well as utilizes the Carbon Calculator for Land Use Change from Biofuels Production (CCLUB), amply satisfies these requirements. Indeed, several provisions of the IRA mandate use of GREET to calculate the LCA for other transportation fuels, such as hydrogen. *See e.g.* 26 U.S.C. § 45V(c)(1)(B). Notably, these provisions require the use of GREET for other transportation fuels and hydrogen reference the same definition of "lifecycle greenhouse gas emissions' under the Clean Air Act as the IRA's SAF provisions. In addition, EPA utilized GREET, along with other models, to implement the RFS program's major expansion in 2010. 74 Fed. Reg. 24,904, 24,916 (May 26, 2009). Multiple states that lead the nation on climate change regulation, including California and Oregon, also use GREET for evaluating lifecycle emissions of biofuels.

GREET and CORSIA have similar approaches to calculating ETJ lifecycle GHG emissions with one critical difference: CORSIA erroneously includes substantial induced land use change emissions.

As noted above, GREET and CORSIA are substantially similar, with multiple shared inputs, similar design and scope, and a core emissions value for U.S. ETJ within *one-tenth of one gram* CO2e/MJ of each other. Additionally, similar to CORSIA, GREET allows producers to select specific inputs that reflect a particular fuel's production processes and feedstock inputs to allow precise calculation of GHG lifecycle emissions (rather than use of inaccurate default values).[4]

However, for ETJ SAF, CORSIA substantially overestimates the impact of iLUC, which significantly skews that model's results. Recent analyses of iLUC converge on a central estimate much closer to GREET's value for this input than CORSIA's. For example, a recent paper by scientists from Harvard University on the current state of LCA modelling concluded that the

[4] At a *minimum*, Treasury must allow producers to use CORSIA's actual value methodology in lieu of CORSIA default values. The actual value methodology, like GREET, determines emissions on a facility-specific basis, resulting both in more accurate LCA values and incentives to use lower carbon production processes (i.e. carbon capture).

"credible range" of iLUC values for U.S. corn ethanol lies between -1.0 and 8.7 gCO2e/MJ.[5] The relevant GREET/CCLUB iLUC value is within this range at 7.4 gCO2e/MJ.[6]

CORSIA, in contrast, falls far outside of this credible range with an iLUC value of 25.1 gCO2e/MJ.[7] Rather than utilizing the current best available science, CORSIA's iLUC value hews closer to outdated estimates from over a decade ago.[8] Modeling techniques have improved considerably in recent years due both to improvements in the models and improvements in the accuracy of inputs.[9] For example, older LCA models failed to account for the ability of intensification (increasing crop yield) rather than extensification (increasing crop acreage) to meet increases in demand.[10] Further, empirical data now allows for additional refinement to improve the accuracy of model results.[11]

Exclusive reliance on CORSIA for calculation of ETJ emissions risks incorporating the methodology's flawed iLUC calculation – which is based on non-U.S. standards – into U.S. tax policy and substantially disadvantaging U.S. ETJ producers. Congress avoids overreliance on CORSIA by requiring the acceptance of alternative LCA methodologies which meet certain minimum standards. 26 U.S.C. § 40B(e)(2); *Id.* § 45Z(b)(1)(B)(iii)(II). Indeed, U.S. tax policy should not tie itself to international aviation safety organizations that are far less experienced and sophisticated in biofuels LCA modeling than the U.S. Department of Energy's National Laboratories.

We strongly encourage Treasury to implement the alternative methodology provisions of 40B and 45Z by allowing use of the state-of-the-art, highly credible, U.S. Government-backed GREET model to measure ETJ's lifecycle emissions. In fact, precluding ETJ producers from utilizing GREET would be arbitrary, capricious, and contrary to the statute. 5 U.S.C. § 706(2)(a); *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 468 U.S. 837 (1984); *Physicians for Social Resp'y v. Wheeler*, 956 F.3d 634 (D.C. Cir. 2020) (finding that multiple statutory mandates require agencies to consider the best available science when enacting environmental policy).

Finally, Treasury must ensure that producers can reduce their lifecycle GHG emission values, and accordingly enhance their 40B and 45Z tax credits, based on GHG reductions they

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[5] Scully, et. al. *Carbon intensity of corn ethanol in the United States: state of the science* 16 Environ. Res. Lett. 043001 (2021).
[6] *Id.*
[7] *CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels*, International Civil Aviation Organization, (March 2021). Some of the differences in ILUC values can also be attributed to ICAO's political decision to amortize ILUC values over 25 years, the average of the European Union's 20 years and the United States' 30 years. Consistent with EPA's decision in 2010 with longstanding precedent under GREET and other U.S. modeling approaches, Treasury should amortize indirect emissions over 30 years.
[8] For example, EPA's 2010 analysis produced an iLUC value of 26.1 gCO2e/MJ. EPA has admitted that its 2010 analysis pre-dates significant advancements in the study of LCA modeling and has initiated work to update its analysis. *See Renewable Fuel Standard (RFS) Program: RFS Annual Rules Regulatory Impact Analysis*, U.S. EPA (June 2022) at 67-71; *Announcing Upcoming Virtual Meeting on Biofuel Greenhouse Gas Modeling*, 86 Fed. Reg. 73,756 (Dec. 28, 2021).
[9] Scully, et al. at 3.1.
[10] Taheripour, et. al. *The impact of considering land intensification and updated data on biofuels land use change and emissions estimates*, 10 Biotechnology for Biofuels 191 (July 2017).
[11] Life Cycle Associates, *Review of GHG Emissions of Corn Ethanol under the EPA RFS2* (Feb. 4, 2022) at 13.

achieve across the entire lifecycle of their fuels. When fuel producers use GHG-reduction strategies, such as lower-carbon production practices and technologies, LCA methodologies account for those strategies and the resulting fuels have a lower lifecycle GHG emissions value. By incorporating that approach into the 40B and 45Z credits, Treasury will incentivize further GHG emissions reductions and further the IRA's goals. Any other approach, such as GHG emissions values that do not account for the array of potential GHG-reduction strategies, would fail to incentivize further reductions and accordingly frustrate the purpose of these tax credits.

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Growth Energy appreciates Treasury's consideration of this input as it implements the IRA's tax credit provisions in a manner that ensures the best available science is used to calculate eligibility for and amount of credits. We look forward to engaging further on this important work and would be happy to meet with your staff to present on these issues in more detail and answer any questions.

Sincerely,

Emily Skor
CEO
Growth Energy

CC: The Honorable Tom Vilsack, Secretary, U.S. Department of Agriculture
The Honorable Jennifer Granholm, Secretary, U.S. Department of Energy
The Honorable Pete Buttigieg, Secretary, U.S. Department of Transportation
The Honorable Michael Regan, Administrator, U.S. Environmental Protection Agency
The Honorable Brenda Mallory, Chair, White House Council on Environmental Quality