

May 10, 2024

Liane Randolph
Chair, California Air Resources Board

Steven Cliff
Executive Officer, California Air Resources Board
1001 I Street
Sacramento, CA 95814

Comment submitted electronically

RE: Authorizing Section 40B Book-and-Claim Accounting for Ethanol Will Enable Decarbonization of the Light-Duty Vehicle Fleet and Attract Federal Funding to California

Dear Chair Randolph and Executive Officer Cliff:

This comment letter is submitted on behalf of a group of low carbon solution providers, ethanol fuel producers and trade associations consisting of Eco-Energy, Growth Energy, POET and the Renewable Fuels Association. This comment is focused upon the opportunity to align California policy with federal policy pertaining to book-and-claim power sourcing for ethanol facilities. Multiple agencies of the federal government have been exploring these same issues to establish guidelines and requirements under Inflation Reduction Act (“IRA”) section 40B pertaining to sustainable aviation fuel (“SAF”).

This comment letter provides our recommendations regarding the optimal Low Carbon Fuel Standard (“LCFS”) policy structure to accelerate the decarbonization of ethanol. Based on our review, we are of the opinion that the LCFS book-and-claim system should be aligned with the federal 40B SAF guidance that the SAF Interagency Working Group developed for both ethanol and SAF. Indeed, the 40B structure relies heavily on CARB’s existing LCFS book-and-claim structure for electricity used as a transportation fuel and for the production of electrolytic hydrogen. This existing LCFS regulatory structure coupled with the additionality guardrail imposed by the 40B guidance presents an excellent opportunity for CARB to establish a similar and consistent policy structure available to ethanol and other low carbon liquid fuel producers.

The Ethanol Industry is Dedicated to Decarbonization

The ethanol industry has been the most consistent workhorse in the LCFS program and was the primary source of LCFS credits during the period from 2011-2016. During the entire twelve years that the LCFS has been existence, ethanol has been an extremely reliable credit generator. There has been dramatic growth in E85 usage during the time of the LCFS program with an E85 demand of approximately 3.5 million gallons in 2011 at the advent of the program rising

dramatically to 118 million gallons by 2023.¹ However, since there a limited number of flex fuel vehicles that can utilize E85 on the road, there is a limit to E85 market expansion. Ethanol has also been limited in its opportunity to displace gasoline gallons in that California is the only state in the country that has not yet approved E15. This is a top priority of the industry, and we emphasize that the approval of E15 will enable a rapid increase in ethanol in the marketplace and a corresponding drop in fossil-based gasoline and greenhouse gas (“GHG”) emissions.

Faced with these market-access barriers, the ethanol industry has focused heavily on the decarbonization of the ethanol molecule. The carbon intensity of ethanol is falling faster than any other low carbon fuel supplied to California. Looking forward, many of the nation’s ethanol producers have committed to zero carbon ethanol production before 2050. The current proposed amendments to the LCFS program fall short of maximizing technologically feasible and cost-effective greenhouse gas emission reductions that are possible when utilizing higher blends of ethanol and indirect accounting for renewable process energy incorporation in ethanol production. We focus this comment on the issue of indirect accounting and how its integration into the LCFS program for ethanol could benefit California in a time of heavy federal spending.

The Value of Indirect Accounting

The value of indirect accounting to ethanol is best illustrated by examining the potential carbon intensity reduction that would be available to an ethanol facility that could utilize zero-CI electricity to power a thermal battery. Such a decarbonization strategy would displace both the CI associated with the electricity use and the natural gas demand of the ethanol facility. While ethanol plants vary in their CI scores based on many factors, **Exhibit A** provides the CI breakdown of a fairly typical but higher CI than average ethanol facility that has been determined to have a CI score of 69.11. Two important components of this CI score are the facility’s natural gas usage which contributes 20.5 CI points and electricity usage which contributes 4.66 points.

The use of zero CI power to charge a thermal battery that would provide power and heat to the facility would zero out both the electricity and natural gas CI components and as a result drop the CI score of ethanol delivered from the facility to California to 43.95, a 36% drop in CI score. Again looking forward, the future use of carbon sequestration and storage coupled with the recognition of climate smart agricultural process to grow the facility’s feedstock would enable the same facility to deliver zero or near-zero CI ethanol to California. Given the massive deficits that persist on the gasoline side of the LCFS market, these additional CI reductions and corresponding GHG reductions delivered by ethanol would be highly valuable toward achieving California’s goal of achieving carbon neutrality by 2045.

To understand the power of book-and-claim accounting to unlock federal dollars, it is necessary to examine the LCFS credit value that is driven by a switch from fossil-based power to renewable energy. For the following calculations to determine the impact of zero-CI electricity on the value of LCFS credit generation, we will use the facility’s current CI score of 69 gCO₂/MJ and compare that with a 40B/zero-CI electricity CI score of 44 gCO₂/MJ. CARB’s

¹ CARB, “Alternative Fuels: Annual E85 Volumes,” at <https://ww2.arb.ca.gov/resources/documents/alternative-fuels-annual-e85-volumes>.

LCFS Dashboard provides a credit calculator that is an excellent tool for determining the value of LCFS credits based on user inputted values for compliance year, LCFS credit price, CI score, vehicle utilized, fuel displaced, and other factors.² The following chart showing values determined by the CARB credit calculator is based on: the compliance year of 2025, the reference fuel of conventional gasoline, a vehicle-fuel EER of 1, and fuel equivalency of: dollars per gallon of ethanol. The LCFS credit prices used are low (\$50/MT), medium (\$150/MT), and high (\$250/MT) credit market scenarios. Utilizing these parameters yields the following credit values per gallon fuel, supplemental revenue for lower CI fuel, and increased revenues per year and over 15-year return on investment period.³

CI Score	\$50/MT	\$150/MT	\$250/MT
69	\$.07	\$.21	\$.34
44	\$.17	\$.51	\$.85
Premium Value	\$.10/gallon	\$.30/gallon	\$.51/gallon
Annual Premium Value @ 100 MGY	\$10,000,000	\$30,000,000	\$51,000,000
Premium Over 15 Year Return on Investment Period	\$150,000,000	\$450,000,000	\$765,000,000

Harmonization of California and Federal Policy
Will Maximize Federal Funding to California and Speed Decarbonization

In this LCFS rulemaking, CARB can and should harmonize the life cycle analysis (“LCA”) methodology that underlies LCFS crediting for ethanol with the federal LCA methodology for SAF. By establishing an LCA methodology within the LCFS regulation for ethanol that is consistent the 40B LCA methodology, CARB will facilitate greater development of this vitally important fuel source for the gasoline sector that will ultimately serve as a feedstock for alcohol to jet that will supply the hard to abate aviation sector. Through this regulatory strategy, CARB will also achieve upstream emission reductions and stimulate expansion of Low-CI power generation capacity, storage and transmission during the peak spending period of IRA and Infrastructure Investment and Jobs Act (“IIJA”).

As demonstrated in the prior analysis, the LCFS regulatory structure pertaining to Low-CI power sourcing has a material impact on the financial performance of an ethanol facility by altering the revenue stream that the LCFS programs provides to low carbon fuel production facilities that supply qualifying transportation fuels to California. While the total amount of revenue varies across the low, medium and high market scenarios, all three scenarios are highly significant in a commodity fuel market that sells fuel on basis points rather than pennies. An additional revenue stream of \$0.07 to \$0.85 per gallon of fuel produced can swing a marginal project to profitability thereby attracting debt and equity investment that would otherwise not participate. A 100 MGY

² CARB, “LCFS Data Dashboard,” Credit Value Calculator available for download via Figure 7 link, at <https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard>

³ This calculation is not adjusted to reflect the compliance costs associated with sourcing Low-CI Power that is compliant with the LCFS book-and-claim program requirements as this information is not publicly available. Compliance does represent a significant cost that offsets a portion of the additional revenues.

ethanol facility is capital intensive requiring hundreds of millions of dollars to construct from start to finish. These facilities are long-term investments that typically will not provide a return on investment for at least a 15-year period. However, once the capital expenditure for the facility is recovered, the facility can become highly profitable thus justifying the initial investment. Over that 15-year period, the ability of an ethanol facility to source zero-CI power will deliver \$450 million in additional revenue in a medium LCFS market, \$150 million in a low LCFS market, and \$765 million dollars in a high LCFS market. It is for this reason that ethanol producers are keen to access the Low-CI power market.

Can an LCFS Regulatory Change Increase California's Access to Federal Funding?

As highlighted by a Brookings Institute Report, taken as a whole, the IIJA and IRA will deliver well over a trillion dollars to the U.S. economy over the period of a decade. It is a substantial undertaking for the federal government to establish the necessary programs, program structures, eligibility requirements, application process, and oversight for the programs.⁴ The IIJA was signed into law on November 15, 2021,⁵ and the IRA was signed into law on August 16, 2022.⁶ However, according to a comprehensive analysis released on May 8th by Politico, only a small slice of the funds have been spent. According to Politico:

- *Less than 17 percent of the \$1.1 trillion those laws provided for direct investments on climate, energy and infrastructure has been spent as of April, nearly two years after Biden signed the last of the statutes.*
- *Out of \$145 billion in direct spending on energy and climate programs in the Inflation Reduction Act, the biggest climate law in U.S. history, the administration has announced roughly \$60 billion in tentative funding decisions as of April 11. (...)*
- *And only \$125 billion has been spent from the \$884 billion provided by the infrastructure law and the pandemic law, both of which Biden signed in 2021. Roughly \$300 billion of that won't be legally available to spend until the next two fiscal years. (...)*
- *The IRA also unleashed a gusher of private company investments in clean energy and manufacturing by offering a series of tax breaks that, based on recent estimates, are worth at least \$525 billion.”⁷*

⁴ Adie Tomer, Caroline George and Joseph W. Kane for Brookings Research, “The start of America’s infrastructure decade: How macroeconomic factors may shape local strategies,” at <https://www.brookings.edu/articles/the-start-of-americas-infrastructure-decade-how-macroeconomic-factors-may-shape-local-strategies/>

⁵ U.S. Department of Transportation, “Bipartisan Infrastructure Law/Infrastructure Investment and Jobs Act,” at <https://www.phmsa.dot.gov/legislative-mandates/bipartisan-infrastructure-law-bil-infrastructure-investment-and-jobs-act-iiija>

⁶ U.S. Department of the Treasury, “Inflation Reduction Act, at <https://home.treasury.gov/policy-issues/inflation-reduction-act#:~:text=On%20August%2016%2C%202022%2C%20President,made%20in%20the%20nation's%20history>.

⁷ POLITICO, “Biden’s big bet hits reality,” by Jessie Blaeser, Benjamin Storrow, Kelsey Tamborrino, Zack Colman and David Ferris, at <https://www.politico.com/interactives/2024/biden-trillion-dollar-spending-tracker/> (emphasis in original).

**An LCFS Book-and-Claim System Consistent with the 40B SAF Tax Credit will
Drive Federal Dollars To California**

Based on the direct nexus between LCFS credit revenues and the economic viability of projects that low carbon fuel developers seek to finance and build, a group of low carbon fuel production companies have been funding a comprehensive analysis by Zero Emission Advisors and directed by NLC. This analysis has focused on the funding components contained in the IJIA and IRA that are most relevant to low carbon fuels and low carbon energy including funding designated for land restoration, feedstock development, wildfire risk management, energy generation, energy storage, large scale transmission, microgrids, waste and sanitation, advanced fuel technologies, hydrogen, SAF, hydrogen fuel cell and battery electric vehicles, alternative fuel and charging stations, and community assistance. Subsequent to the identification of all of the remaining funding opportunities that have a sufficient nexus with the low carbon fuel sector, the focus of the IRA/IJIA project has been to identify the highest value potential sources of funding for specific companies given that company's feedstock, fuel, technology, and its possible ancillary benefits. For ethanol facilities, the following were the highest value identified programs.

Site Development \$4.2B:

The first step is the strategic selection and development of the project site. The commitment to sustainable development supports targeting brownfield sites. By redeveloping these sites, the project revitalizes underutilized land and benefits from the Environmental Protection Agency's Brownfields Program, which provides essential funding for the cleanup and repurposing of these properties. Additionally, the Department of Energy's Smart Grid Investment Matching Grant Program will be instrumental in establishing the necessary infrastructure to support the facility's advanced technology and efficient energy management.

Enhanced Green Energy Integration \$500M:

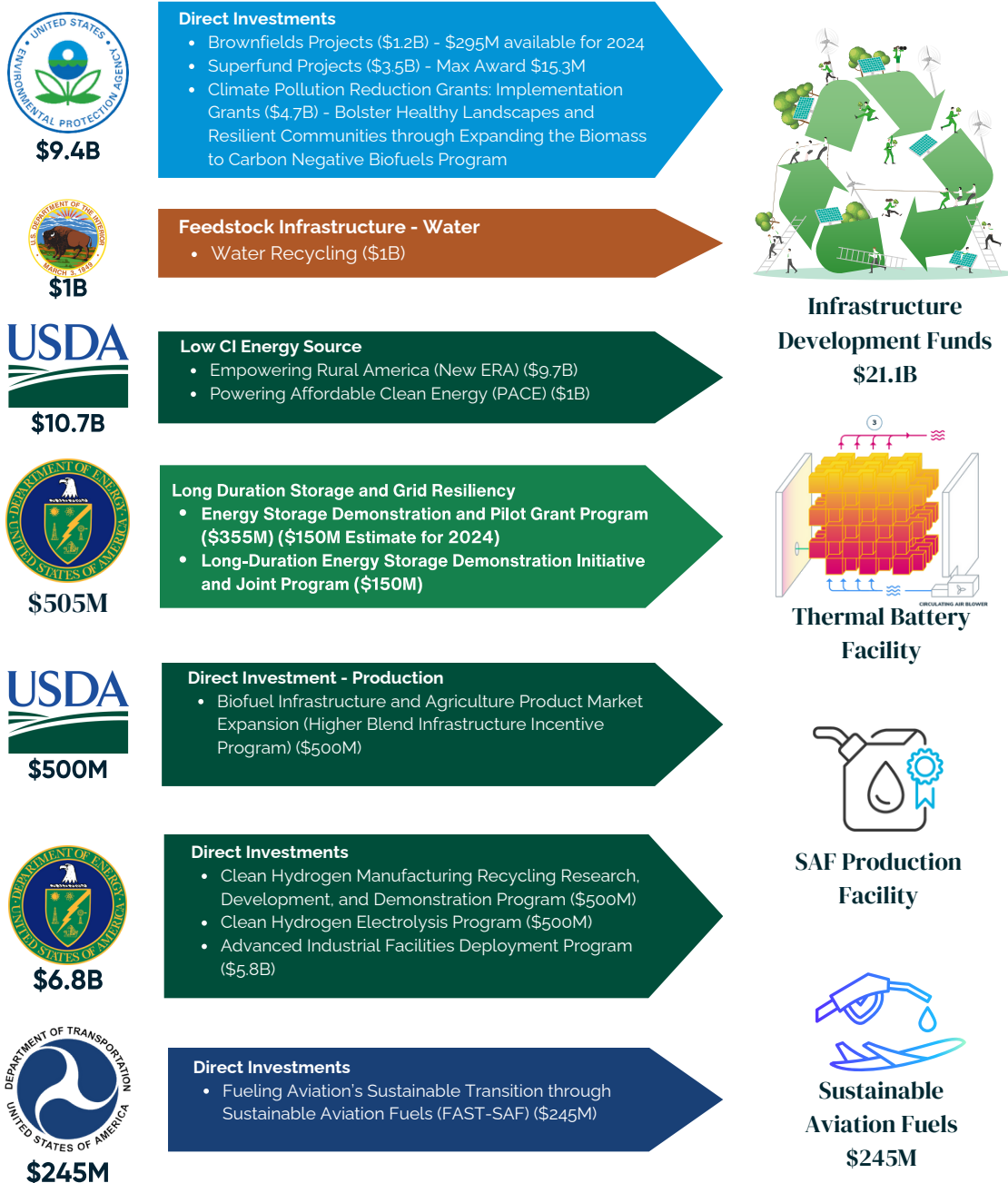
To further enhance the ethanol production facility's sustainability and resilience, the project will prioritize integrating curtailed renewable energy sources and advanced energy storage solutions, such as Thermal Batteries. The Department of Energy's Long-Duration Energy Storage Demonstration Initiative and Energy Storage Demonstration and Pilot Grant Program will provide the necessary funding to develop and deploy these cutting-edge storage technologies. By incorporating these solutions, the facility can efficiently manage intermittent renewable energy generation, ensuring a stable and reliable power supply while minimizing its carbon footprint.

CO2 Sequestration \$4.9B:

A vital aspect of the project's commitment to environmental sustainability is its focus on capturing and sequestering biogenic CO2 emissions from ethanol production. The Department of Energy's Carbon Utilization Program, Carbon Dioxide Transportation Infrastructure Finance and Innovation Program, and Carbon Storage Validation and Testing initiatives, contributing to the funding and development of advanced carbon capture, transportation, and storage technologies. By pioneering these solutions, the project will not only minimize its greenhouse gas emissions but also significantly contribute to the broader effort to combat climate change, aiming to reduce the region's CO2 emissions by 50% within the next decade.

For details of these highlighted federal funding programs and other programs with strong potential to provide funding with a nexus to an ethanol facility sited in California, please see **Exhibit B**. The following graphic depicts the various funding opportunities to the ethanol facility itself as well as to the larger system of feedstocks, transport, and carbon sequestration.

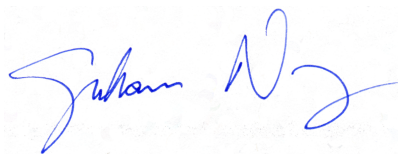
IMMEDIATE FEDERAL FUNDING AVAILABLE - ETHANOL PLANT



Conclusion

We appreciate the opportunity to provide this LCFS comment and to share the results of our analysis regarding federal funding opportunities that would be enhanced by the availability of book-and claim power sourcing for ethanol.

Sincerely,



Graham Noyes
Noyes Law Corporation

Exhibit A (Ethanol CI Table)

<u>Farming</u>	CARB Baseline	Changes to CI with Thermal Battery and Zero Emission Electricity
Farming Energy	2.96	2.96
Fertilizers + Pesticides	11.15	11.15
Field Emissions	13.83	13.83
Feedstock Transport	1.5	1.5
Total Farming	29.44	29.44
Co Product Credits	-10.88	-10.88
Ethanol Production/Transportation		
NG Boiler	20.5	0
Electric Power	4.66	0
Enzymes/Chemicals	2.02	2.02
Ethanol Transport	3.57	3.57
Total Ethanol	30.75	30.75
iLUC	19.8	19.8
Feedstock	38.36	38.36
Fuel	30.75	30.75
Total	69.11	25.16

Exhibit B

Agency	Program	Program Description	Funding Amount
Department of Agriculture	Biofuel Infrastructure and Agriculture Product Market Expansion (Higher Blend Infrastructure Incentive Program)	To provide grants through the Higher Blend Infrastructure Incentive Program, which has the goal of significantly increasing the sales and use of higher blends of ethanol and biodiesel by expanding the infrastructure for renewable fuels derived from U.S. agricultural products and by sharing the costs related to building out biofuel-related infrastructure.	\$500,000,000
Department of Agriculture	Powering Affordable Clean Energy (PACE)	To provide partially forgivable loans to renewable-energy developers and electric service providers, including municipals, cooperatives, and investor-owned and Tribal utilities, to help finance large-scale solar, wind, geothermal, biomass, hydropower projects and energy storage in support of renewable energy systems.	\$1,000,000,000
Department of Agriculture	Empowering Rural America (New ERA)	To fund the construction of electric distribution, transmission, and generation facilities for rural electric cooperatives, including system improvements.	\$9,700,000,000
Department of Energy	Advanced Industrial Facilities Deployment Program	To provide competitive financial support to owners and operators of facilities engaged in energy intensive industrial processes to complete demonstration and deployment projects that reduce a facility's greenhouse gas emissions.	\$5,812,000,000

Agency	Program	Program Description	Funding Amount
Department of Energy	Long-Duration Energy Storage Demonstration Initiative and Joint Program	To establish a demonstration initiative composed of demonstration projects focused on the development of long-duration energy storage technologies.	\$150,000,000
Department of Energy	Energy Storage Demonstration and Pilot Grant Program	To enter into agreements to carry out 3 energy storage system demonstration projects.	\$355,000,000
Department of Transportation	Fueling Aviation's Sustainable Transition through Sustainable Aviation Fuels (FAST-SAF)	To provide grant funding for eligible entities to carry out projects relating to the production, transportation, blending, or storage of sustainable aviation fuel (SAF), with the goal of accelerating the production and use of sustainable aviation fuel and reducing greenhouse gas emissions from the aviation sector.	\$244,530,000
Environmental Protection Agency	Climate Pollution Reduction Grants: Implementation Grants	To provide grants to Tribes, states, air pollution control agencies, and local governments to develop and implement plans for reducing greenhouse gas emissions.	\$4,750,000,000
Environmental Protection Agency	Superfund	The Environmental Protection Agency's Superfund program is responsible for cleaning up some of the nation's most contaminated land.	\$3,500,000,000
Environmental Protection Agency	Brownfields Projects	The Environmental Protection Agency's Brownfields Program provides funds to empower States, communities, Tribes, and nonprofit organizations to prevent, inventory, assess, clean up, and reuse brownfield sites.	\$1,200,000,000