



Elizabeth Bourbon
Sr. Managing Counsel

Submitted Via CARB Comment Submittal Form

December 21, 2022

Dr. Cheryl Laskowski
California Air Resources Board
1001 I Street
Sacramento, CA 95812

**Re: Valero Comments on Low Carbon Fuel Standard:
November 9, 2022 Public Workshop**

Dear Dr. Laskowski:

On behalf of Diamond Alternative Energy, Valero Renewable Fuels, and other entities that are part of the Valero family of companies (collectively, "Valero"), I appreciate the opportunity to provide these comments regarding proposed amendments to the California Low Carbon Fuel Standard ("LCFS").

As one of the largest producers, importers, and sellers of transportation fuel in California, Valero is committed to lowering the carbon intensity of our renewable fuels. Through its Diamond Green Diesel joint venture, Valero operates the largest renewable diesel plant in the United States, with an annual capacity of 690 million gallons in 2021 that will expand to 1.2 billion gallons annually, making it the predominant renewable diesel producer in the United States and the second largest in the world.

Valero is also North America's largest renewable fuels producer and is the world's second largest corn ethanol producer, with 12 ethanol plants in the U.S. and a total annual production capacity of 1.6 billion gallons per year. Valero is among the leading producers of ultra-low-carbon cellulosic ethanol and we are aggressively pursuing measures to reduce the carbon intensity of our ethanol production through carbon sequestration. Meanwhile, Valero continues to supply the California market with both traditional refined fuels and renewable fuels. With innovation in

feedstocks and production processes and carbon capture opportunities, Valero’s low-carbon liquid fuels have outperformed, and have the continuing potential to outperform, the mandated technology choices of the California Air Resources Board (CARB) in its Final 2022 Scoping Plan, on a full life-cycle carbon intensity basis as well as on a cost basis.

Valero welcomes the opportunity to provide feedback at this stage on CARB’s proposed changes to the LCFS program. Like CARB, Valero believes that the program should be robust and clear, as well as implementable for both reporting entities and CARB. Based on the varied roles Valero plays in manufacturing and supplying renewable and traditional fuels to the California market, Valero is uniquely situated to identify programmatic improvements aimed at ensuring LCFS carbon reduction targets are met. With the broad impact the California LCFS has on emerging programs in other states and internationally, it is important that the program is continually improved to better ensure carbon reductions are achieved and that the program functions efficiently and with transparency. With this in mind, Valero offers the following comments to improve the next iteration of the California LCFS program.

Comments on CARB’s Potential Changes to the LCFS

Valero is providing feedback, as requested by CARB, regarding the concepts below, as presented in the November 9, 2022 workshop.

I. Elimination or Addition of Certain Credit Generation Pathways

CARB should not eliminate LCFS credit generation for liquid fuels. Generally, the intent of the LCFS, and the Final 2022 Scoping Plan¹ more broadly, is to stimulate investment in low-carbon transportation fuel projects. However, the elimination of credit pathways that have no other economic incentive or regulatory driver sends a signal to potential investors in the program that the LCFS is unstable and not a long-term viable option for recouping capital investment costs. Furthermore, it is not aligned with the following statements in the Final 2022 Scoping Plan:

“The challenge before us requires us to keep all tools on the table.”²

“California structures our climate policies and regulations to create market signals and certainty that spur private sector investment.”³

“Total consumption of renewable diesel in the California LCFS market has skyrocketed from approximately 1.8 million gallons in 2011 to nearly 589 million gallons in 2020. The LCFS is a key driver of market development for renewable diesel and its coproducts. While the federal renewable fuel standard (RFS) and blenders tax credit also benefit producers, an analysis of their respective contributions to market development, and interviews with industry representatives

¹ Final 2022 Scoping Plan. <https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf>

² *Id.* at Page 11.

³ *Id.* at Page 36.

and independent experts, point to LCFS as a more important factor in market development, at least in recent years.”⁴

Additionally, since California LCFS has a both a national and world-wide impact on emerging programs, it is critical that the LCFS continue to provide a wide array of economic incentives to encourage development in other jurisdictions. As the Scoping Plan acknowledges, “Low carbon fuel mandates similar to California’s LCFS have been adopted by the U.S. EPA and by other jurisdictions, including Oregon, Washington, British Columbia, the European Union, and the United Kingdom. Many other jurisdictions from Japan to New Zealand, Australia, and the European Commission also continue to seek information and technical experience on [California’s] LCFS.”⁵

a. Electric Vehicle Crediting Should be Phased Out

During the November workshop, CARB staff explained various measures under consideration to provide pricing relief and to stabilize the credit market, such as capping credits for crop-based biofuels and eliminating credits for renewable natural gas. As detailed below, Valero has serious concerns with those measures. If CARB’s goal is to provide for pricing relief and to stabilize the credit market, it seems that it would be more appropriate for CARB to eliminate electric vehicle (EV) crediting under the LCFS. As noted in the Scoping Plan, “The Advanced Clean Cars II regulation fulfills the goal in the Executive Order and serves as the primary mechanism to help deploy ZEVs.”⁶ Since EVs are now mandated under the Advanced Clean Cars II (ACC II) regulation, it is unnecessary to use the LCFS to incentivize EV infrastructure development.

b. Potential Cap on Crop-Based Fuels

California has seen an influx of renewable diesel projects, which has prompted CARB to consider a cap on crop-based fuels. However, the maturity of the renewable diesel market in California is prompting this consideration, and CARB’s inclusion of such a cap would make the LCFS less “exportable” to other jurisdictions. Further, CARB should consider the long-term credibility impacts of creating a credit program specifically to send a market signal to incentivize significant investment and then arbitrarily changing that incentive structure once investments have been made. The lack of regulatory stability may be viewed as a risk factor that may discourage future projects requiring significant capital investment.

Valero also agrees with the commenter during the Workshop who questioned how CARB would manage the delay in credit generation from crop-based fuels. Given the

⁴ *Id.* at Page 38.

⁵ *Id.* at Page 39.

⁶ *Id.* at Page 185.

LCFS reporting scheme, data submittal to CARB and subsequent data generation is delayed by a time period between three and six months. Therefore, CARB's implementation of a cap would be infeasible and likely always to be exceeded due to this delay.

i. Indirect Land Use Change Factors Already Penalize Crop-Based Fuels

During the Workshop, numerous stakeholders expressed concerns about instituting arbitrary limits, questioned assumptions on use of virgin oil, and asked if a cap on crop-based fuels could delay California achieving its climate goals. Valero agrees that CARB should be leveraging the previous modeling research on factors for indirect land use change (ILUC), which is an existing framework within the LCFS for penalizing crop-based fuels. Additionally, using a model such as CARB's California Transportation Supply Model, rather than an arbitrary cap, would be preferred. Using the existing framework along with science-based modeling would continue to keep the LCFS as a feedstock- and technology-neutral program.

ii. Distillers' Corn Oil from Ethanol Plants

CARB should not consider distillers' corn oil (DCO) from ethanol plants as a "virgin oil feedstock", since it is inedible and not designed for human consumption.⁸ Its alternative uses from being a renewable diesel feedstock are as animal feed or common industrial products – which is different from both soy and canola oils. DCO is a byproduct of the ethanol production process; corn is not grown strictly to provide DCO, and a different milling process is used to make food-grade corn oil.

Given this fact, CARB must exclude DCO from any potential crop-based feedstock cap that it is considering, as the conversion of DCO to a renewable transportation fuel would not impact the food supply.

c. Book & Claim Eligibility

CARB is considering limiting the book and claim eligibility of renewable natural gas (RNG) to projects in the "Western Natural Gas Network"⁹ without an explanation of how this network will be defined. Although Valero understands the intent to align book and claim for RNG projects with that for renewable power (such as wind or solar), Valero disagrees with the LCFS not allowing renewable power book and claim. While regional natural gas and electricity networks largely operate independently from those in other regions, there are transfer points between other

⁸ "Animal, vegetable or mineral (oil)?" Page 7. <https://theicct.org/wp-content/uploads/2022/01/impact-renewable-diesel-us-jan22.pdf>

⁹ LCFS Workshop Presentation, 11/9/2022. Slide 32. <https://ww2.arb.ca.gov/sites/default/files/2022-11/LCFSPresentation.pdf>

regions. Therefore, book and claim should be allowed for both RNG and renewable electricity projects.

d. Potential Removal of Petroleum-Based Pathways

CARB should not eliminate any means for producers of petroleum products to generate LCFS credits. As noted in the Scoping Plan, fossil fuels will continue to be used for transportation for “some time”:

“Conventional ICE vehicles from legacy fleets will remain on the road for some time, even after all new vehicle sales have transitioned to [zero-emission vehicle (ZEV)] technology. In addition, some equipment types are only now in the initial stages of development of ZEV technology for propulsion, such as commercial aircraft or ocean-going vessels. In addition to building the production and distribution infrastructure for zero-carbon fuels, the state must continue to support low-carbon liquid fuels during this period of transition and for much harder sectors for ZEV technology such as aviation, locomotives, and marine applications.”¹⁰

Allowing fossil fuel producers to generate LCFS credits by any technologically feasible means will continue to foster innovation and investment in lower-carbon technologies.

II. Carbon Capture & Sequestration (CCS) and Direct Air Capture (DAC)

Valero strongly encourages CARB to maintain the ability within the LCFS to generate credits via CCS and DAC projects. Furthermore, more flexibility within these project types in the regulation would encourage additional innovation and investment in projects that could have the largest impact on California’s progress toward its climate goals. Facilities fitted with CCS or DAC may offer the best alternative to reach net-zero for hard to decarbonize industries. Carbon sequestration coupled with low-carbon fuels (and also low-carbon hydrogen) could also result in net negative GHG emissions. According to the International Energy Agency:

“[Carbon capture, utilization and storage] can facilitate the transition to net-zero CO₂ emissions by: tackling emissions from existing assets; providing a way to address emissions from some of the most challenging sectors; providing a cost-effective pathway to scale up low-carbon hydrogen production rapidly; and allowing for CO₂ removal from the atmosphere through [bioenergy with carbon capture and storage] and [direct air capture with carbon capture and storage].”¹¹

III. Self-Ratcheting Mechanism

¹⁰ Final 2022 Scoping Plan, Page 190. <https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf>.

¹¹ Net Zero by 2050: A Roadmap for the Global Energy Sector. Page 79/224. <https://www.iea.org/reports/net-zero-by-2050>.

A self-ratcheting mechanism was discussed briefly during the Workshop. If CARB introduces this concept into the LCFS, the mechanism must be clearly-defined, stable, transparent, predictable, and based on real data submitted to CARB.

IV. California Transportation Supply Model (CATS)

Given that the CATS model is Python-based, it is not fully transparent and is difficult for an average user to interpret. CARB should seek peer review for the model before relying on the information generated by the model to support policy development.

V. CATS Model Technical Documentation

Valero requests that each of the calculations for the CATS model inputs be transparent and shown in an equation format in the Technical Documentation. Valero provides the following specific comments on the CATS Model and Documentation that was made available publicly via the CARB website.

a. Feedstock Supply Curves – Electricity¹²

CARB’s assumption that electricity is available at an “infinite quantity for transportation at a price of \$80 per MWh” is grossly inaccurate. As seen during numerous weather events that have strained the California power grid, such as the heat wave last September that prompted Governor Newsom to call for conservation measures and narrowly avoided rolling outages even with recent measures to improve electrical supply and reliability,¹³ electricity is not available at an infinite quantity. The California Public Utility Commission’s (“CPUC”) recently adopted Integrated Resource Plan for 2018-2020 demonstrates that substantial new resource capacity will be required to support accelerated electrification.¹⁴ By 2026, when ACC II goes into effect, the CPUC must plan for a new resource buildout of 28,154 MW, climbing to 43,131 MW by 2032.¹⁵ It is therefore incorrect and misleading to assert that electricity is available at “an infinite quantity.”

Furthermore, CARB’s source for this cost estimate, a 2021 paper published by Next 10,¹⁶ noted that the residential electricity prices in the state are out of line with the rest of the country and that to electrify transportation and buildings will require reforming the electricity rate structure, or else the current inefficiencies and inequities

¹² California Transportation Supply (CATS) Model – Technical Documentation; November 2022. Page 8. <https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf>.

¹³ See, for example, <https://www.utilitydive.com/news/electric-reliability-power-outage-extreme-weather-california-texas-pacific-northwest-ercot-caiso/637065/>.

¹⁴ CPUC, Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes, Decision No. 22-02-004 (Feb. 10, 2022), <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M451/K412/451412947.PDF>.

¹⁵ *Id.* at 87.

¹⁶ <https://www.next10.org/sites/default/files/2021-02/Next10-electricity-rates-v2.pdf>.

present in California will be further exacerbated. Indeed, the solutions advanced by the paper include either raising tax revenue through sales or income taxes or an income-based fixed charge.¹⁷ Regardless of the option selected, the cost of electrification would be borne by higher-income households.¹⁸ This will likely not be a politically feasible solution to the exorbitant cost of electrifying transportation in California.

b. Fuel Production Costs, Conversion Efficiency, and Carbon Intensity

i. Biomass-Based Diesel¹⁹

CARB states that “[t]he carbon intensities for biomass-based diesel pathways were estimated by averaging together the carbon intensity scores for all LCFS-certified pathways.” Valero assumes that an energy-weighted average was calculated for the CATS input. Additionally, Valero assumes that only carbon intensities from the latest CA-GREET model were used in the average. If these assumptions are correct, then CARB should state this in the technical documentation and also provide this back-up calculation.

ii. Gasoline and Diesel²⁰

Valero questions CARB’s regression analysis that was used to calculate the conversion cost for gasoline and diesel. The conversion cost for gasoline and diesel can vary widely by refinery, crude slates, cost of energy (electricity and natural gas), and the mix of final products. Additionally, CARB must include the increased cost of electricity, as California’s grid mix moves toward 100% renewable – at a higher cost to the consumer.

iii. Ethanol²¹

Valero agrees with CARB’s carbon intensity calculation for the addition of CCS to an ethanol plant. However, CARB should not assume that all ethanol plants are able to sequester emissions; the ability to sequester is highly dependent on the geology in the plant’s region.

CARB should include sugarcane-based ethanol in the CATS model, as it is notably absent.

¹⁷ *Id.* at Page 5.

¹⁸ *Id.*

¹⁹ California Transportation Supply (CATS) Model – Technical Documentation; November 2022. Page 9. <https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf>.

²⁰ *Id.* at Page 11.

²¹ *Id.* at Page 12.

The assumptions outlined above for Biomass-Based Diesel should also be clarified for ethanol in the Technical Documentation, as well.

iv. Conventional Jet Fuel²²

The conversion cost for conventional jet fuel from crude oil should not be \$0/ton. Generally, conventional jet fuel costs less to produce than ULSD, but there is still a cost to the producer for the fuel. This cost should have been included with the analysis for gasoline and diesel conversion costs.

c. Exogenous Subsidies and Additional Costs

i. Biomass-based Diesel²³

CARB should correct the ethanol equivalence value for renewable diesel to 1.6. Although many renewable diesel plants are able to obtain an equivalence value of 1.7, the Renewable Fuel Standard only provides for this equivalence value if the renewable diesel has a lower heating value of at least 123,500 Btu/gal – and the producer must also apply to receive an equivalence value of 1.7. In fact, US EPA has approved many renewable diesel registrations as having an equivalence value of less than 1.7.²⁴

ii. Sustainable Aviation Fuel²⁵

This section of the Technical Documentation states that the Blender's Tax Credit was captured in the process economics for renewable diesel, but the section of the Technical Documentation for renewable diesel is silent as to the tax credit. CARB should update all sections to be fully transparent regarding calculations.

iii. Renewable Gasoline

The Technical Documentation provided by CARB is silent as to how the exogenous subsidy was calculated for renewable gasoline. Renewable gasoline has an ethanol equivalence value of 1.5 and generates D5 Renewable Identification Numbers (RINs), which traded at approximately \$0.04 higher than D4 RINs in 2022. Using CARB's stated value of a D4 RIN at \$1.45, one D5 RIN

²² California Transportation Supply (CATS) Model – Summary Inputs spreadsheet.

²³ California Transportation Supply (CATS) Model – Technical Documentation; November 2022. Page 20.
<https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf>

²⁴ <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/registered-companies-and-facilities-part-80-fuel>

²⁵ California Transportation Supply (CATS) Model – Technical Documentation; November 2022. Page 21.
<https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf>

would be valued at roughly \$1.49. Therefore, Valero provides a calculation for renewable gasoline below.

$$\begin{aligned} & \textit{Subsidy}_{\textit{Ren.Gasoline}} \\ &= 1 \textit{ gal ren. gasoline} \times \frac{1.5 \textit{ RINs}}{\textit{gal}} \times \frac{\$1.49}{\textit{RIN} - \textit{gal}} \times \frac{\textit{gal}}{119.53 \textit{ MJ}} \\ &= \$0.019/\textit{MJ} \end{aligned}$$

In the above calculation, Valero has used the published energy density for CARBOB available in the LCFS, as the regulation does not have a standard energy density for renewable gasoline. All such calculations should be transparent in the Technical Documentation and should easily translate to the values in the CATS Summary Input file.

VI. Additional Comments

a. ILUC Factors for Renewable Power Installations

CARB should include ILUC factors for renewable power installations, most notably large areas covered by solar panels. Valero understands that renewable power fed into the electric grid is a critical component of CARB's climate goals. However, Valero sees that these projects could be reducing the amount of natural and working lands available as carbon sinks. Given the critical role devoted to ensuring natural and working lands function as carbon sinks as soon as possible, as established in the Final Scoping Plan²⁶, the negative impact of renewable power installations to natural and working lands will be pivotal in driving the change CARB wishes to accomplish. Such considerations must be made to fully understand both positive and negative impacts on all projects.

b. Latest Model and Factors from Argonne

CARB should update its CA-GREET 3.0 model to reflect the most recent emission factors in Argonne's GREET model. Argonne's factors reflect the latest scientific research on farming practices and renewable fuels.

c. Emissions Leakage

Valero has strong concerns regarding CARB's failure to account for leakage potential in the CATS modeling inputs or in the Scenario Designs. CARB has a responsibility to minimize the "leakage" potential of any regulatory activities.²⁷ As part

²⁶ Final 2022 Scoping Plan, Pages 89-91. <https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf>

²⁷ HSC § 38562(b)(8).

of this responsibility, CARB must analyze the potential for emission reduction activities in the state to be offset by an equivalent or greater increase in emissions of GHGs outside the state. This analysis necessarily requires estimating emissions outside the state, which CARB has failed to do, in defining the CATS inputs and in outlining scenarios under consideration.

d. Administrative Language in the LCFS

Valero recommends that CARB add administrative procedure language for staff practices that are not currently documented in the LCFS regulation or guidance and to ensure transparency, fairness, and consistency. Specifically, guidance regarding CARB's interpretation of regulatory provisions should be provided to the regulated community as well as to third-party verification bodies. Officially outlining and cataloging the procedures behind implementation of the LCFS program will provide a level playing field for regulated parties and verification bodies; enhance CARB's administrative efficiency; and will also be helpful for other jurisdictions that are looking to California's LCFS program as a model.

* * * *

Valero appreciates the opportunity to provide feedback at this critical stage of the LCFS amendments development. Should you have any questions, please contact me at 210-345-4650 or via email at elizabeth.bourbon@valero.com.

Sincerely,



Elizabeth Bourbon
Senior Managing Counsel