January 7, 2022

Cheryl Laskowski, Ph.D.
Chief, Transportation Fuels Branch
Industrial Strategies Division
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95814-2815

Re: NBB and CABA Comments on LCFS Concepts

Dear Dr. Laskowski:

The National Biodiesel Board (NBB) and the California Advanced Biofuels Alliance (CABA) thank you for the opportunity to provide comments on potential concepts[1] for the next iteration of the Low Carbon Fuel Standard (LCFS). NBB is the U.S. trade association representing the entire biodiesel and renewable diesel value chain, including producers, feedstock suppliers, and fuel distributors. Our members are also producing an increasing amount of sustainable aviation fuel to meet a growing demand. CABA is a not-for-profit trade association promoting the increased use and production of advanced biofuels in California. CABA has represented biomass-based diesel (BMBD) feedstock suppliers, producers, distributors, retailers, and fleets on state and federal legislative and regulatory issues since 2006.

Experience-based Amendments Needed Now vs. Those Informed by 2022 Scoping Plan Update

As an initial matter, we believe CARB does not need to wait -- nor should it wait -- for completion of the 2022 Scoping Plan Update in order to conduct a straightforward and targeted LCFS rulemaking that addresses various implementation issues that have remained unresolved since the 2018 and 2015 LCFS rulemakings.[2] CARB staff signaled the need and willingness to conduct such a "cleanup" rulemaking in early 2019, but that rulemaking was delayed multiple times, first by the COVID-19 pandemic, later for various

[1] Unless otherwise noted, references to CARB staff concepts and comments are to the Powerpoint presentation and staff notes ("December 7th Workshop") as shown at https://ww2.arb.ca.gov/sites/default/files/2021-12/LCFS%2012_7%20Workshop%20Presentation_notes.pdf, accessed Jan. 6, 2022.

[2] In this regard, NBB is aligned with similar comments made by other stakeholders. For example, see verbal comment by Eileen Tutt, Executive Director, California Electric Transportation Coalition, at the Dec. 6th workshop, calling for a LCFS rulemaking, prior to or at least concurrent with development of the 2022 Scoping Plan Update.

Missouri Headquarters
605 Clark Ave.
PO Box 104898
Jefferson City, MO 65110
(800) 841-5849

Washington, D.C. Office
1331 Pennsylvania Ave., NW
Suite 505
Washington, DC 20004
(888) 246-3437

California Office
1415 L Street
Suite 460
Sacramento, CA 95814
(916) 760-8870

Massachusetts Office
36 Jonspin Road
Suite 235
Wilmington, MA 01887
(978) 267-3020

www.nbb.org www.biodiesel.org

other reasons, and then finally to await completion of the Scoping Plan Update. However, it is not necessary to further delay such a targeted rulemaking since the focused rulemaking need only address implementation issues that have virtually nothing to do with the Scoping Plan Update. This is especially important in light of CARB staff's projection that the earliest any new LCFS rulemaking can take effect after completing the Scoping Plan Update is 2024.[3] For some issues that have remained unresolved since 2015, this would mean that those issues would not be addressed, if they are addressed at all, for at least nine years since they were first identified.

Our remaining comments respond to specific questions/items for which CARB staff solicited feedback.

Establishing More Aggressive Carbon Intensity (CI) Targets Pre- and Post-2030, Harmonizing with Long-Term Climate Goals

Harmonizing with Long-Term Targets. As CARB well knows, investors in low-carbon fuels require long-term certainty in order to secure the funding needed for high capital expense projects. These include new charging infrastructure for vehicle electrification; clean hydrogen production and refueling stations; organic waste digesters and biomethane upgrading facilities; and new and expanded biodiesel and renewable diesel feedstock pre-processing and fuel production facilities. While the current CI standards are set to remain in effect through 2030, it would provide even greater investor certainty for CARB to set standards through 2050, consistent with California's long-term 80% GHG reduction and carbon neutrality goals. Since the LCFS is one of California's marquee carbon reduction strategies that will remain important throughout the life of the state's climate program, the LCFS' market signal and investment certainty would be greatly enhanced by setting longer term targets through 2050 as it would reflect the state's long-term commitment to an aggressive, all-of-the-above decarbonization effort. This clear commitment would, in turn, help de-risk the near and long-term private sector investment decisions needed to accomplish the state's climate objectives.

Establishing Declining Pre- and Post-2030 Targets. We applaud California's efforts to establish aggressive CI reduction targets and strongly encourage CARB to think bigger. We have previously provided comments on the feasibility of pursuing a complete petroleum diesel replacement program through 2035 via a vastly expanded program facilitating the use of renewable drop in fuels like biodiesel and renewable diesel to complement the state's aggressive vehicle electrification efforts. To sum, NBB and CABA believe the LCFS CI targets can be revised to provide for a deeper decline in CI reductions both pre- and post-2030 consistent with a goal of complete petroleum diesel displacement by 2035. We incorporate by reference those prior comments and attach them to this letter for your convenience.[4]

It is important to emphasize that new carbon emissions must be eliminated or reduced to the maximum extent feasible and as quickly as possible in order to address climate change effectively. The Intergovernmental Panel on Climate Change (IPCC) recently released its latest report (AR6) amplifying the need for quick and effective actions to reduce GHG emissions to reduce the worst effects of climate

[3] December 7th Workshop, op cit., staff notes at slide 10.
[4] See joint NBB and CABA comments on the 2022 Scoping Plan Update, Scenario Concepts Technical Workshop, at https://www.arb.ca.gov/lists/com-attach/25-sp22-concepts-ws-VzkAZFIxUV0CZwJj.pdf, accessed Jan. 7, 2022.

change[5]. The use of petroleum fuels in transport continues to be the largest source of anthropogenic emissions in California and other states, so strategies to address climate change and achieve carbon neutrality as quickly as possible must have, at a minimum, the goal of eliminating, or reducing to the maximum extent feasible, the use of petroleum fuel[6].

While the current CI reduction target of 20% by 2030 is aggressive, we believe even more stringent CI reduction targets are feasible in the 2025-2035 timeframe. Indeed, Oregon has leapfrogged California and is now pursuing the most aggressive CI reduction target in the U.S. for transportation fuels, a 25% reduction by 2035. But even that standard can be further strengthened. By ratcheting down the CI targets even more, we believe states like California and Oregon can enhance the strong market signals already generated by their respective clean fuels programs, thereby further incentivizing innovations that can bring more alternative and sustainable fuels to these states. This is especially important given the time value of carbon and the urgency of reducing carbon emissions in the near term versus achieving the same reductions in the long term (e.g., the climate benefit of reducing X tons/year of carbon emissions today is much more impactful than reducing the same X tons/year in 2040, given how long that carbon remains in the air during those intervening years).

Setting the pre- and post-2030 targets too low would run a number of risks. For example, the state risks setting up an oversupply of credits due to its expanded and aggressive electrification efforts, new/expanded renewable diesel production coming online in the next several years, and new/expanded renewable natural gas production. The oversupply, in turn, would likely depress LCFS credit prices, reducing the program's market signal and further eroding investor interest in California's low carbon fuels market, making it more difficult for the state to reach its climate objectives in the long term.

Further, setting the targets too low misses the opportunity to achieve "low hanging fruit" GHG reductions as quickly as possible, such as expanding the use of drop-in petroleum replacements like biodiesel and renewable diesel. Because these are drop-in fuels that can completely replace a fleet's petroleum diesel consumption immediately and without any additional infrastructure or vehicular changes, targets that are too low would not be able to leverage the ability of these diesel replacements to reduce GHGs and harmful co-pollutants like particulate matter (PM) to the maximum extent feasible in the near term.[7]

From our perspective, there are few, if any, substantive downsides to setting the targets too high; previous experience shows the market responds to strong policy signals. When California doubled its CI reduction targets in 2018 to 20% by 2030, the low carbon fuels industry responded by innovating new technologies and expanding production of low carbon fuels to meet the increased demand. For example, the biomass-based diesel sector increased supplies of low carbon biodiesel and renewable diesel in California by 51%

[5] IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.

[6] The transition from petroleum fuel use in transportation and other sectors has been identified as a priority objective in Governor Newsom's Executive Order N-79-20 and other related executive orders.

[7] For example, a number of fleets are already using R80/B20 blends that are 100% sustainable and renewable.

from 2018 through 2020 (and that includes the economic dampening from the COVID-19 pandemic).[8] Indeed, the fact that California is now actively exploring whether to accelerate its pre-2030 CI targets or even deepen them further through 2030 and beyond[9] suggests there's headspace for additional CI reductions. The biomass-based diesel industry is already ramping up efforts to further increase supplies of biodiesel and renewable diesel to help California, Oregon, and Washington decarbonize one of the most difficult to decarbonize sectors, medium and heavy duty on- and off-road vehicles and equipment. A set of more aggressive targets would leverage the efforts to increase clean fuel supplies already underway by the biomass-based diesel industry, as well as those involved in providing electrification, renewable natural gas, and other low carbon fuels.

Expanding Use of Book-and-Claim Accounting

CARB staff is soliciting comments on the expanded use of book-and-claim accounting, specifically for new-or-expanded low-CI hydrogen injected into hydrogen pipelines. While we have no objection to that concept, we question why CARB is limiting this concept only to hydrogen pipeline injection. At its heart, the LCFS has always been about reducing the CI of a wide mix of fuels in the state's transportation fuel pool. To date, this has been accomplished through continued reductions in the CI of the individual fuel types, and a large portion of those reductions have occurred via innovations in the fuel production process. Book-and-claim can help continue those innovation trends by facilitating the procurement of lower CI renewable energy and feedstocks in the production of low carbon fuels like biodiesel and renewable diesel. Since drop-in fuels like biodiesel and renewable diesel currently comprise nearly half of the carbon reductions in the entire LCFS program[10], and may need to achieve even greater reductions in both GHGs and harmful co-pollutants in the coming years[11], it seems the logical approach would be to encourage further innovations in CI reductions in those fuels that are actively achieving the lion's share of carbon reductions in the program, rather than focusing just on niche fuels like hydrogen.

Reflect Changes in Technology and Data

We wholeheartedly agree on the need for the LCFS to be based on the best-available science and data, particularly data based on CARB's real world experience and observations obtained over ten years of implementing this program. Thus, it is perplexing why CARB staff is proposing to update underlying data, assumptions and emission factors only for electricity and hydrogen fuel pathways - and even the lifecycle

[8] CARB LCFS Quarterly Data Spreadsheet, https://ww2.arb.ca.gov/sites/default/files/2021-12/quarterlysummary_103121.xlsx, accessed Dec. 22, 2021. From 2018 through 2020, overall credit generation from all fuels increased by 34%. Ibid.

[9] See Dec. 7th Workshop, op cit., and 2022 GHG Scoping Plan Update process, https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/scoping-plan-meetings-workshops.

[10] CARB LCFS Quarterly Data Spreadsheet, op cit., showing biodiesel and renewable diesel have provided 44-45% of the LCFS carbon reductions and credits every year since 2017 and have provided 42% of the reductions overall since 2011.

[11] Bushnell, J., Mazzone, D., Smith, A., & Witcover, J. (2020). Uncertainty, Innovation, and Infrastructure Credits: Outlook for the Low Carbon Fuel Standard Through 2030. *UC Office of the President: University of California Institute of Transportation Studies*. Retrieved from https://escholarship.org/uc/item/7sk9628s, Executive Summary at v., showing that California's biomass-based diesel blend rate would need to increase to perhaps 60%-80% (from its current 24%) in order to meet California's aggressive 2030 target in the absence of large-scale transportation electrification.

assessment model for petroleum fuels[12] - when the vast majority of the carbon reductions are being generated by biofuels and other alternative fuels. A program predicated on sound science should incorporate the best available data and science for all the fuels covered by the program, not just a select few. There is no valid reason to delay implementing updates to underlying data sets and assumptions that are not borne out by real world data and the most recent scientific developments. Again, we point CARB staff to our prior September 3, 2021[13] and November 11, 2020 comments[14] (also attached) showing the specific updates that are needed for this program to reflect the best available science and data for a number of significant alternative fuels on which the LCFS is heavily dependent for its success.

Developing a Single CI Benchmark for Gasoline and Diesel

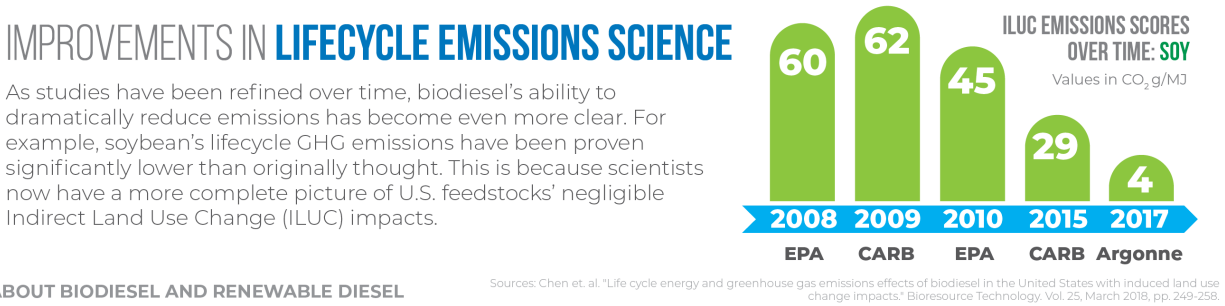
To our knowledge, this is the first time this concept has been broached publicly by CARB staff. We do not have sufficient information on which to base comments on and will therefore reserve such comments until more information on staff's thinking is available.

Stakeholder Comments

CARB staff noted two separate but related stakeholder comments provided by NBB and others: (a) the reevaluation of land use change (LUC) carbon intensity values, and (b) consideration of site-specific agricultural inputs in fuel pathway life cycle analyses.

Reevaluation of Indirect Land Use Change (ILUC) Values. Staff's initial reaction to this comment was to suggest that they have "not seen a consensus in the literature that warrants directional changes in existing land use change values." This response is perplexing and somewhat misses the point. First, the suggested reevaluation of ILUC values is not a "directional change," but merely a reflection of the decade-long ongoing downward trend in ILUC CI values, resulting in greater than a 50% reduction in ILUC values since ILUC was first introduced in 2009 as a theoretical construct (Fig. 1):

Fig. 1 Evolution of Indirect Land Use Change CI Scores



[12] See Dec. 7th Workshop, op cit. at slide 15

[13] See NBB and CABA comments to Richard Corey, Executive Officer, https://www.arb.ca.gov/lists/com-attach/25-sp22-concepts-ws-VzkAZFIxUV0CZwJj.pdf, at 8, accessed Jan. 7, 2022.

[14] See NBB comments to Acting Transportation Fuels Branch Chief, https://www.arb.ca.gov/lists/com-attach/120-lcfs-wkshp-oct20-ws-WjQCZgBjUV0FYFM8.pdf, at 2-8, accessed Jan. 7, 2020.

Second, further work by Argonne National Lab and others since CARB last visited the ILUC values in 2015 suggest the actual impact of indirect land use change, based on real world observational data, was substantially overestimated by CARB and needs to be updated to maintain the scientific integrity of the LCFS.

Consideration of Site-Specific Agricultural Inputs. We again reiterate the need for CARB to incorporate consideration of agricultural measures that help to reduce GHG emissions and enhance carbon sinks, particularly for natural and working lands. This is especially relevant given the 2022 Scoping Plan Update's emphasis on achieving greater carbon reductions through actions taken on natural and working lands. Such actions, which on farms are well established as positive steps contributing to GHG reductions and sequestration, include the use of cover crops, no-till farming, and other measures that can be effectively incentivized through appropriate policy mechanisms like the LCFS. We have commented previously on this topic in our joint comments with CABA on September 3, 2021 and reiterate those comments here.[15] In addition, we support the comments on this topic that were submitted by the Low Carbon Fuels Coalition.

Improving Local Community Health Through Expanded Use of Biofuels While Pursuing Electrification

Besides achieving greater GHG reductions, a more aggressive set of CI targets would facilitate greater co-benefits in the near and long term, particularly in reducing health impactful pollutants like diesel particulate matter (diesel PM). As the LCFS Dashboard has already shown, volumes of cleaner drop-in fuels like biodiesel and renewable diesel have provided the single largest source of carbon reductions in the LCFS for a number of years now[16]. Those carbon reductions have been accompanied by significant reductions in diesel PM, which is of particular concern to disadvantaged and environmental justice (EJ) communities that tend to be co-located with high-diesel use facilities like ports, logistics, and other sites. And as noted in the referenced UC Davis-ITS work[17], the current blend rate for biomass-based diesel would need to increase threefold or more for California to achieve its 2030 targets in the absence of deep and widespread vehicle electrification. As noted, these drop-in diesel replacements reduce GHGs substantially, upwards of 86% or more (74% on average) as compared to petroleum diesel. But just as important, these diesel replacements significantly reduce diesel PM emissions, upwards of 50-70% or more in older, legacy vehicles (i.e., those without diesel particulate filters).

While states like California and Oregon are rightfully pushing to electrify all emission sources as quickly as possible, it is well understood that, in difficult to decarbonize sectors like medium and heavy duty on- and off-road vehicles, such a transition will likely take many years and very large investments in both new vehicles, charging infrastructure, and clean power generation. This begs the question of what the state can do - while it is pursuing deep electrification in these challenging sectors - to continue to reduce both GHGs and air pollution that adversely affects its residents, especially those in disadvantaged and EJ communities.

While biodiesel's ability to reduce diesel PM emissions is well-established, there is little, if any, work in the literature to quantify those benefits at the neighborhood or census tract level in metrics that are relevant to ordinary citizens (e.g., cancer burden reduced, premature deaths avoided, asthma cases mitigated, etc.). Thus, over the past two years, NBB has commissioned Trinity Consultants to quantify the public health

[15] See NBB and CABA joint comments, op cit. at 8.
[16] CARB LCFS Quarterly Data Summary, op cit.
[17] Bushnell et al., op cit.

benefits of replacing petroleum diesel with biodiesel in such legacy vehicles. Using the same air dispersion and health risk assessment modeling tools used by U.S. EPA and CARB, the resulting Trinity Study quantified the expected benefits from such a switch in terms of premature deaths avoided, asthma cases reduced, work loss days avoided, and minor restricted activity days reduced, and translated those results into avoided health costs for 28 different high diesel activity sites in various states across the country, including the Port of Los Angeles/Long Beach and San Bernardino (see Figs. 2 and 3).

Fig. 2. Projected Cancer Risk Reduction and Other Health Benefits by Switching to Biodiesel in Legacy HD Vehicles (POLA/POLB)

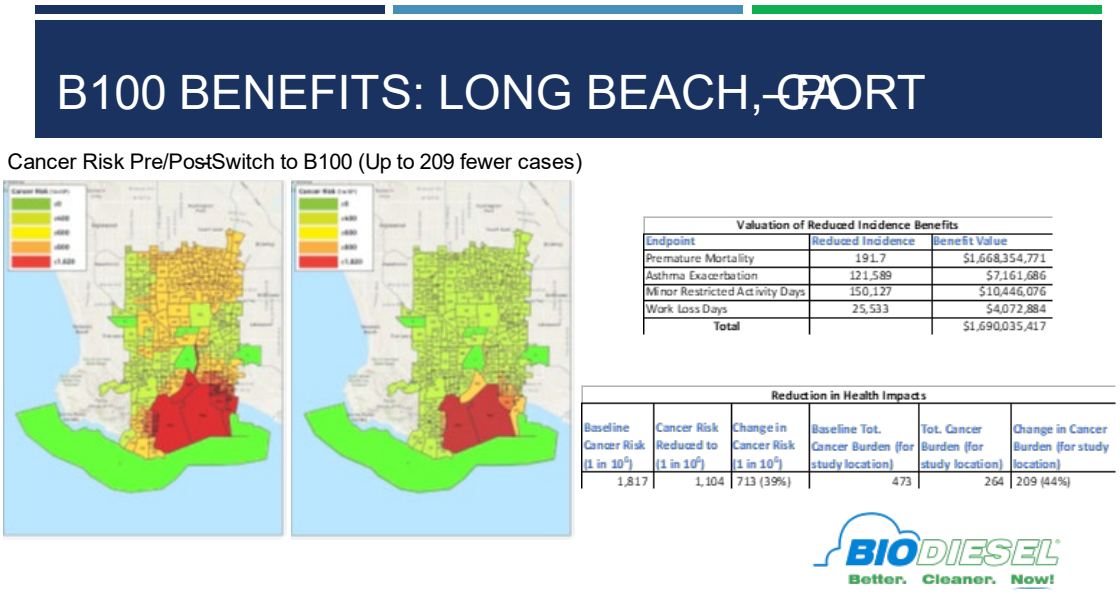
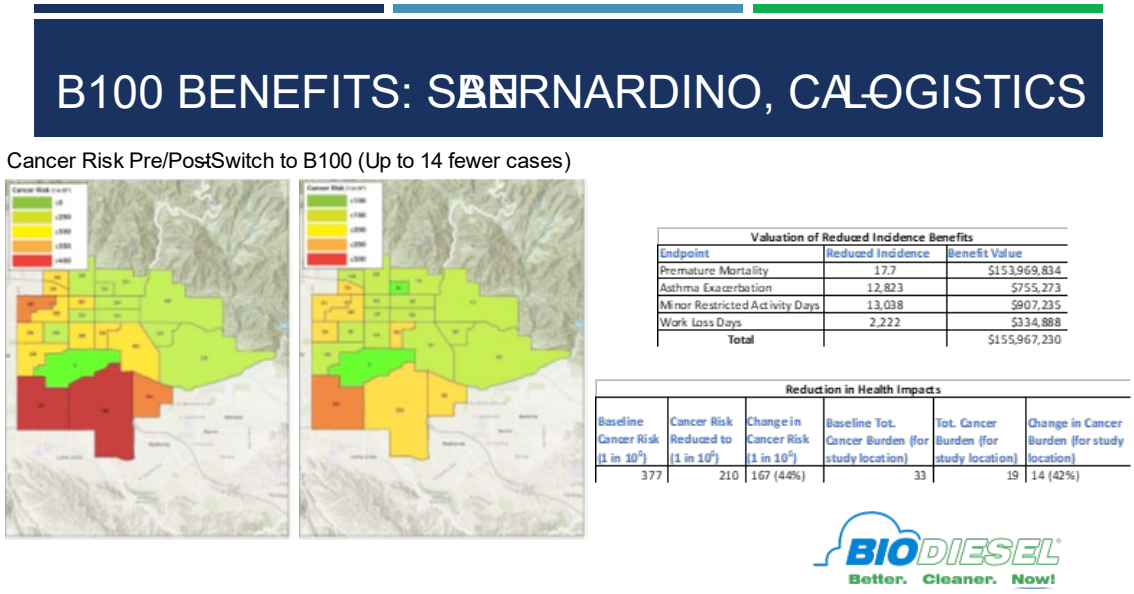


Fig. 3 Projected Cancer Risk Reduction and Other Health Benefits by Switching to Biodiesel in Legacy HD Vehicles (San Bernardino logistics site)



Source: https://www.biodiesel.org/docs/default-source/trinity-study/trinity-nbb-tranportation-health-risks-review-v1-03.pdf?sfvrsn=ec0f774a_2.

As shown in Figures 2 and 3, switching from petroleum diesel to B100 in legacy vehicles operating in the Port of L.A./Long Beach and San Bernardino would reduce cancer burden from exposure to diesel PM by about 44% (a reduction of over 220 cancer cases over a 70-yr timeframe), along with annual reductions in premature deaths (209), asthma attacks (over 134,000), and work loss days (nearly 28,000), cumulatively worth over $1.8 billion per year in avoided health costs. And that is just for these two sites; substantial health improvements can be achieved in other areas around California exposed to high diesel emissions.

These benefits are especially important for disadvantaged and EJ communities, many of which are located at or near sites that still use high levels of petroleum diesel. At these sites, there are significant numbers of legacy vehicles that can benefit from the reduced DPM emissions which biomass-based diesel provides. And these sustainable diesel replacements would benefit even the more modern, 2007 and newer engines by reducing their GHG emissions and particle loading of the diesel particulate filters, thereby improving their longevity and maintenance.

Conclusion

The biomass-based diesel industry, and more recently the growing sustainable aviation fuel sector, have been strong champions of the West Coast's efforts to address climate change. We applaud California's leadership and efforts to reduce GHGs further from the transportation sector through an expansion of the Low Carbon Fuels Standard program. NBB and CABA believe the state should continue strengthening the LCFS, both through a near-term, targeted rulemaking to address ongoing implementation issues along with a longer-term rulemaking to establish post-2030 targets, to achieve greater carbon and air pollution reductions. We strongly encourage CARB to consider deeper and more aggressive CI reduction targets, as well as implementing the updates and improvements noted in this letter to reflect the best available science and real-world experience. We appreciate the good working relationship we have developed with CARB over many years and look forward to working cooperatively and productively as you proceed with the expansion rulemaking.

Adoption of these recommendations will help ensure that biomass-based diesel fuels will continue to play the strong role they have played historically and must continue to play -- especially in the difficult to decarbonize sectors like medium and heavy-duty on-road and off-road vehicles -- while California works toward a much lower carbon future.

Sincerely,

Floyd Vergara, Esq., P.E.
Director of State Governmental Affairs
National Biodiesel Board

Rebecca Baskins
Executive Director
California Advanced Biofuels Alliance

Main Office
605 Clark Ave.
PO Box 104898
Jefferson City, MO 65110
(800) 841-5849

DC Office
1331 Pennsylvania Ave., NW
Suite 505
Washington, DC 20004
(888) 246-3437

CA Office
1415 L Street
Suite 480
Sacramento, CA 95814
(916) 760-8870

November 3, 2020

Acting Chief
Transportation Fuels Branch
California Air Resources Board
P.O. Box 2815
1101 I Street
Sacramento, CA 95814

Re: NBB Comments on Potential LCFS Regulation Revisions

To Whom It May Concern:

Thank you for the opportunity to provide comments on potential Low Carbon Fuel Standard (LCFS) regulation revisions, which were discussed at a workshop held by California Air Resources Board (CARB) staff October 14-15, 2020. As the U.S. trade association representing the entire biodiesel and renewable diesel value chain, including producers, feedstock suppliers, and fuel distributors, the National Biodiesel Board (NBB) is pleased to offer the following comments for your consideration.

NBB has been fully supportive of efforts to address climate change and has been a strong partner in California, Oregon, and many other jurisdictions that have developed or are developing programs to reduce climate impacts from the use of petroleum fuels. We applaud CARB's efforts to update the LCFS program to correct errors, address concerns, and reflect learnings gained since the regulation was last amended in the 2018 rulemaking. We continue to appreciate CARB's commitment to using the most robust and up-to-date science in the LCFS program. Further, we understand and support CARB's intent to develop post-2030 carbon intensity (CI) reduction targets, either in this rulemaking or the next, pursuant to Governor Newsom's Executive Order N-79-20 and California's climate goals of a 40% reduction in greenhouse gas (GHG) emissions by 2030 and 80% by 2050 (both relative to a 1990 baseline).

As discussed at the October 14th workshop, CARB staff is seeking to update the Oil Production Greenhouse Gas Emissions Estimator (OPGEE), create additional simplified tier 1 calculators, and update existing ones.[1][2] Given the complexity of those proposed updates, we believe it is

[1] https://ww2.arb.ca.gov/sites/default/files/2020-10/101420presentation_stanford_opgee.pdf.
[2] https://ww2.arb.ca.gov/sites/default/files/2020-10/101420presentation_carb.pdf (slide 14)

appropriate to incorporate less complex updates for biofuels, specifically updates to the datasets for modeling indirect land use change (ILUC) and calculations for direct CI emissions pertaining to biodiesel and renewable diesel production (biomass-based diesel or BMBD). We are requesting that CARB staff update, as part of this rulemaking, the datasets underpinning the GTAP-BIO and AEZ-EF models, as well as make other updates to direct CI calculations for biomass-based diesel, as discussed in more detail below.

Updates to Underlying Datasets for GTAP-BIO and AEZ-EF

As noted, we are requesting CARB staff to update the underlying datasets for GTAP-BIO and AEZ-EF for soy, canola, and other crop-based fuels. CARB last updated these datasets in its 2015 rulemaking, using data that was already four or more years old at that time, much of which was not based on scientific observation. Since 2015 significant advances have been made in the literature to update the underlying datasets. Many of these advances allowed GTAP-BIO to reflect scientific observation, rather than solely modeled projections. Updating the databases associated with these models would demonstrate CARB's commitment to using the most up-to-date and robust scientific data. To be clear, we are asking for an update of those datasets, not the modeling tools themselves, to ensure the LCFS continues to reflect the latest scientific developments and data generated over recent years.

The research communities' GTAP-BIO and AEZ-EF modeling runs, using the updated datasets, indicate the potential for significant corrections to the ILUC scores that would more accurately reflect real-world observations made since 2015 (see Attachment 1).

Updates to Various Inputs for Direct CI Calculations for BMBD Fuels

Over the past several years, our members have worked closely with CARB staff in implementing the LCFS program. During that time, a number of corrections, errors, and other needed adjustments have been identified by our members; most of those adjustments have been noted for CARB staff. Accordingly, we request that the direct CI corrections identified in Attachment 1 be considered for formal incorporation into CA-GREET 3.0 to ensure the LCFS continues to reflect the latest science. These changes are consistent with CARB's proposed workplan outlined in the October 14th presentation[3].

Important Role BMBD Serves in the LCFS Program

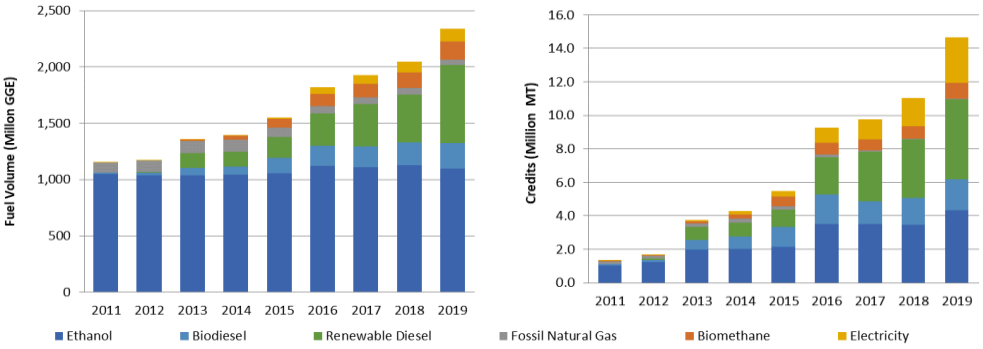
Biomass-based diesel reduces GHGs by upwards of 86%[4] or more and has reduced emissions by over 27 million metric tons in California since 2011 and by 6.6 million metric tons in 2019 alone,

[3] Ibid

[4] Depending on the feedstocks used, BMBD have been scored in California with carbon intensity as low as 8-16, CA LCFS certified "Current Fuel Pathways,"

equivalent to removing more than 1.4 million cars off the road last year. These substantial GHG reductions have helped California reach its 2020 GHG targets four years ahead of schedule[5]. Biomass-based diesel has also helped diversify California's fuel pool and made the diesel fuel pool significantly more sustainable (Fig. 1).

Fig. 1 Growing Diversification of California's Fuel Pool Under the LCFS[6]



Biomass-based diesel has played a key role in the LCFS, providing nearly half (45%) of the LCFS carbon reductions over the last two years and 41% overall since 2011[7] (Fig. 2). These sustainable diesel replacements have grown from a mere 14 million gallons in 2011 to 830 million gallons in 2019[8] (nearly 6000% growth), so that nearly a quarter (22%) of the diesel fuel pool now comprises biomass-based diesel. And that growth is expected to continue as California progresses toward its 20% carbon intensity reduction target in 2030. Indeed, the University of California at Davis has identified the need for up to 60-80% of the diesel fuel pool in California to be replaced by biomass-based diesel if California is to achieve its 2030 target[9].

https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/current-pathways_all.xlsx, accessed Oct. 31, 2020.

[5] California Air Resources Board press release, https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time, accessed Oct. 31, 2020.

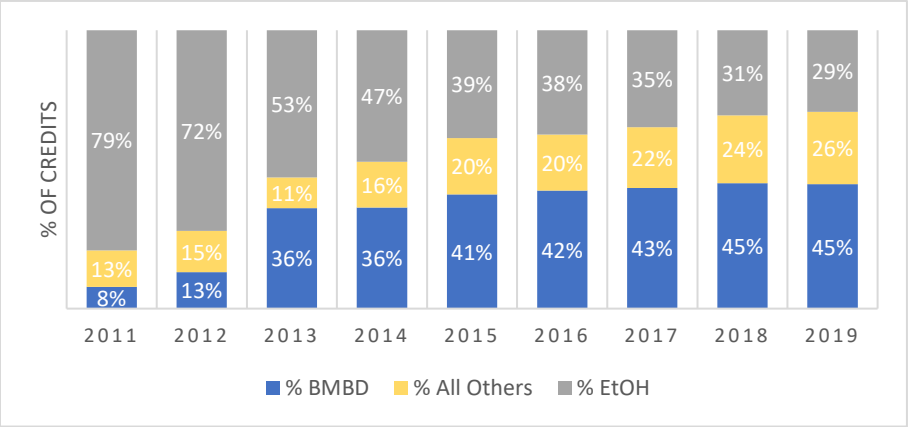
[6] California LCFS Dashboard, July 2020, https://ww3.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm.

[7] Ibid.

[8] Ibid.

[9] Bushnell et al. (Feb. 2020), "Uncertainty, Innovation, and Infrastructure Credits: Outlook for the Low Carbon Fuel Standard Through 2030," University of California Institute of Transportation Studies, at v.

Fig. 2 Biomass-based Diesel's Share of LCFS Carbon Reductions



The growth in California of biomass-based diesel translates to displacement of over 3.3 billion gallons of petroleum diesel since 2011. This represents a reduction in the state's carbon emissions of over 27 million metric tons since the LCFS began, or equivalent to removing about 5.5 million cars off the road since 2011.

Requested Updates Yield Significant GHG Benefits

Significant advancements have been made in expanding and updating the database which supports GTAP-BIO as well as to the direct emission calculations. Nearly all the updates we are suggesting in our written comments and in the attachment were peer-reviewed and published as part of Argonne National Lab's 2018 review of several biodiesel pathways[10]. Adopting the most modern database would be consistent with CARB's stated approach of using the most up to date science and literature.

The 2015 rulemaking was the last to cover indirect land use change, since then researchers have included additional, critical functionality to the database, including agricultural intensification[11] [12]. Additional functionality was also included to recognize the environmental contribution of feed-land substitution[13]. Most critically, the 2015 CARB modeling relied on 2004 economic data. GTAP's database is now updated to reflect economic data from 2011 and shortly will reflect 2014. It is also important that CARB runs GTAP-BIO as it is intended to be run. As noted in a 2016 report to the Coordinating Research Council, CARB adjusted the default

[10] Chen, R., Qin, Z., Han, J., Wang, M., Taheripour, F., Tyner, W., . . . Duffield, J. (2018). Life cycle energy and greenhouse gas emission effects of biodiesel in the United States with induced land use change impacts. Bioresource Technology, 251, 249-258.

[11] Taheripour, F., Cui, H. and Tyner, W.E., 2017. An Exploration of agricultural land use change at the intensive and extensive margins: implications for biofuels induced land use change. Bioenergy and Land Use Change, pp.19-37.

[12] Taheripour, F., Zhao, X. and Tyner, W.E., 2017. The impact of considering land intensification and updated data on biofuels land use change and emissions estimates. Biotechnology for biofuels, 10(1), p.191.

[13] Taheripour, F. and Tyner, W.E., 2020. US biofuel production and policy: implications for land use changes in Malaysia and Indonesia. Biotechnology for Biofuels, 13(1), p.11.

GTAP yield price elasticities (YDEL) to be based on short-term elasticities which was inconsistent with the medium-term time horizon of GTAP. In addition, the total cropland addition results were interrupted incorrectly, CARB calculated the average result of five YDEL cases, rather than running the model once, how its intended to be run, with a average YDEL scenario.[14]

Running updated ILUC scenarios with the additional data and functionality will allow the model to more accurately reflect the world that is unfolding, rather than the world that was predicted by Searchinger. NBB has modeled that if GTAP-BIO and AEZ-EF were updated to reflect the current literature (2011 economic data), soy oil- and canola oil-based biofuel's ILUC penalty would be reduced to 17.5 and 11.7 g CO2e/MJ respectively[15].

Incremental Credit Generation from 1,000,000 Gallons with Revised ILUC (MT CO2e)		
Feedstock	**Biodiesel**	**Renewable Diesel**
Soy Oil	1,463	1,504
Canola Oil	353	363

In addition to updating GTAP-BIO and AEZ-EF, NBB is also requesting that CARB update the tier 1 BD-RD calculator and GREET 3.0 model to both reflect the current state of the literature and to correct a few minor mistakes. We ask that CARB update the tallow (animal fat) pathway to reflect the current literature, which corrected an 96.2% overestimation of energy consumption currently reflected in CARB models[16]. NBB is also requesting that CARB correct the double counting of corn oil extraction emission which is reflected in the biodiesel corn oil pathway. The current pathway within the tier 1 BD-RD calculator charges corn oil with a 2.81 g CO_2e/MJ debit associated with extraction energy at the ethanol plant. These emissions are improperly double counted as the ethanol plant is already charged for the energy consumption associated with corn oil extraction.

Incremental Credit Generation from 1,000,000 Gallons with Revised CI (MT CO2e)		
Feedstock	**Biodiesel**	**Renewable Diesel**
Tallow (Animal Fats)	1,009	1,037
Distillers Corn Oil	355	364

If CARB were to adopt the changes proposed in our written comments and attachment 1, we calculate the LCFS program could generate an additional 17,000,000 incremental credits between 2021 and 2030 if the California fuel pool were to become 100% biomass-based over that timeframe. In 2030 assuming the entire diesel pool is biomass-based, the outlined changes

[14] http://crcsite.wpengine.com/wp-content/uploads/2019/05/E-88-3b-Final-Report-2016-08-23_v2.pdf
[15] Current iLUCs are 29.1 and 14.5 for soy oil and canola oil respectively.
[16] https://greet.es.anl.gov/publication-beef_tallow_update_2017

are adopted, and the feedstock mix remains relatively constant, biodiesel and renewable diesel would generate approximately 27,000,000 credits annual, nearly enough to cover the entire gasoline obligation if the current gasoline pool remains unchanged. Even if biodiesel and renewable diesel do not replace all fossil diesel, it is clear that absent dramatic increases in light duty electrification, biodiesel and renewable diesel will continue to be foundational in fulfilling the overall GHG reduction target of the program.

Additional updates to the GREET model are included in attachment 1. We hope that CARB will consider including these updates in addition to those outlined above as soon as possible so that the LCFS program can continue to have a solid foundation based on the best available science.

Support for Bifurcating Clean-Up and Post-2030 Target Setting Rulemakings

At the workshop, CARB staff requested stakeholder input on whether to incorporate the post-2030 target setting effort into this current rulemaking, which was originally intended to address relatively minor cleanup and corrections such as the updates and adjustments discussed in this letter. The effect of including the post-2030 target setting in this rulemaking would likely be to extend a 1 year rulemaking to 1.5-2 or more years, with an implementation date even further down the road. This would significantly delay the updates we are requesting, thereby adversely harming the biofuels industry. Accordingly, we request that CARB staff pursue a two-rulemaking process, with the current rulemaking effort focused on implementing program updates and corrections, including the ones we have requested in this letter, while tackling the post-2030 target in a separate rulemaking after the current one.

Support for True Up Credits

NBB supports staff's consideration of a true-up provision[17]. This provision will help provide certainty to biofuel producers who are on the verge of having their currently approved CIs retired at the end of 2020 due in a large part to a delay in validation and verification under the new 3rd party audit scheme. Absent adoption of this provision, biofuel producers and the LCFS program stand to lose significant credit generation opportunities for an unknown period. If producers are required to transition to conservative, temporary carbon intensities they lose the ability to capture large portions of their credit value for an unknown amount of time. This could put producers in financially precarious position as their revenue may sharply decline while their input costs would likely remain constant.

Expansion of Book-and-Claim Accounting

We encourage CARB staff to expand the current book-and-claim accounting provisions. Specifically to allow for low-carbon intensity electricity and biomethane to be indirectly

[17] https://ww2.arb.ca.gov/sites/default/files/2020-10/101420presentation_carb.pdf (slide 15)

accounted for when used to reduce the emissions associated with the production of transportation fuels that are supplied to California. This expands on the existing language[18] which allows for book-and-claim accounting of electricity and biomethane when supplied as vehicle fuel or to produce hydrogen. We hope revised and expanded language would create more opportunities for low carbon fuels to participate and would also alleviate challenges with the existing rules.

The current language is restrictive, holding back the deployment of ultra-low carbon intensive fuels. While the current regulation allows biofuel producers to produce renewable electricity onsite and recognize an environmental benefit, this option is often impractical due to several factors including city ordinances, proximity to airports, and local availability of land. Allowing producers additional flexibility to procure offsite renewables, while also maintaining additionality, would be the desired outcome. NBB believes this is possible by requiring the use of a virtual power purchase agreements or similar agreements to ensure the emissions reductions are not double counted and additionality is achieved. In addition to allowing for new end uses, we ask that CARB clarify in the regulation the term 'local balancing authority'[19]. We encourage CARB to consider a more commonly understood system boundary such as local RTO or ISO when designating where qualifying low-carbon electricity can be *booked* relative to the entity wishing to *claim* the low-carbon electricity.

Second, we ask that staff expand the book-and-claim provisions for biomethane, allowing biomethane to offset emission associated with the production of transportation fuels, such as running a steam boiler. The current biomethane provision faces similar challenges to the electricity book-and-claim provision, requiring liquid biofuel producers to build biomethane production facilities behind the fence. This too is often infeasible for similar regulatory and economic reasons. Expansion of this provision will allow additional, critical market opportunities for biomethane production is it is quickly outstripping the current California transportation market. Additionally, expanding qualifying end uses would have the benefit of significantly simplifying the existing biomethane book-and-claim provision for hydrogen production which requires reactor feed methane and boiler feed fuel to be calculated and metered separately when biomethane is used.

EER

We appreciate staff's desire to simplify and clarify the regulation where possible. We are under the impression that simplification and clarification is the intent of the proposed changes to the EERs in the regulation[20]. While simplicity is appreciated, our members have expressed concern

[18] 85488.(i)
[19] 85488.8(i)(1)(A)
[20] https://ww2.arb.ca.gov/sites/default/files/2020-10/101420presentation_carb.pdf (slide 19)

that removal of the default EER of 1 would lead to a requirement that biodiesel and renewable diesel go through an EER certification for each mode of transit they serve. Imposing this new requirement would be impractical now that biodiesel and renewable diesel are approximately 24% of California's diesel fuel pool and there has been no research or anecdotal evidence to show that fuel economy has been affected. We ask that CARB clarify their intent with the removal of the default EER of 1, specifying how it will impact commercially available biofuels who rely on that EER.

Conclusions

We applaud California's efforts to address climate change and strongly encourage CARB to continue updating the LCFS so it reflects the best available science, including direct observational data such as updates we requested. We appreciate the good working relationship we have developed with CARB over many years and look forward to working cooperatively and productively to address the concerns we raised above. Adoption of these recommendations will help ensure that biomass-diesel fuels will continue to play the strong role they have played historically and must continue to play while California works toward a much lower carbon future.

Sincerely,

Matt Herman

Matt Herman
Director of Environmental Science

Attachment 1
(Summary of LCA Updates)

POST-2015 UPDATES TO DIRECT AND INDIRECT CARBON INTENSITY VALUES AND PARAMETERS

DIRECT/ INDIRECT EMISSIONS	MODEL	FEEDSTOCK	UPDATE NEEDED	CURRENT VALUE/CI	UPDATED VALUE/CI	REFERENCE/COMMENTS
DIRECT	CA-GREET	Tallow	Rendering Energy	3944 BTU/lb. This is about **18 g/MJ**	2211 BTU/lb. This is about **10 g/MJ** (GREET 2019)	Chen, R., Qin, Z., Han, J., Wang, M., Taheripour, F., Tyner, W., O'Connor, D. and Duffield, J., 2018. Life cycle energy and greenhouse gas emission effects of biodiesel in the United States with induced land use change impacts. Bioresource Technology, 251, pp.249-258. https://www.sciencedirect.com/science/article/pii/S0960852417321648/pdfft?md5=768c9ac49614fbb7252d0ff821fa3ea9&pid=1-s2.0-S0960852417321648-main.pdf Updates on the Energy Consumption of the Beef Tallow Rendering Process and the Ratio of Synthetic Fertilizer Nitrogen Supplementing Removed Crop Residue Nitrogen in GREET. https://greet.es.anl.gov/files/beef_tallow_update_2017
DIRECT	CA-GREET	Uncooked UCO	Rendering Energy	1073 BTU/lb This is about **5.3 g/MJ**	300 BTU/lb This is about **2 g/MJ**	A new pathway with a default values is recommended for this feedstock. Several renderers have supplied ARB with data on energy use for uncooked UCO rendering operations and these are conservative values. This would restore one of the default pathways that was present in the original regulations.
DIRECT	CA-GREET	Hydrogen	Energy Density	290 BTU/lb	274 BTU/lb	The current value is temperature corrected at 32F whereas the standard for measurement is 60F. CARB has accepted this change but only in approved Tier 2 applications.
DIRECT	CA-GREET	Hydrogen	Carbon Intensity	106,907 g/mm BTU	105,612 g/mm BTU	Existing value includes 150 miles of hydrogen pipeline transportation, which is not applicable in most cases. CARB has also accepted this change on a petition specific basis.
DIRECT	CA-GREET	Corn Oil	Extraction CI	**13.27 g/MJ**	**10.46 g/MJ**	2.81 g/MJ for corn oil extraction is improperly double counted as both an ethanol debit and a biodiesel feedstock debit.

POST-2015 UPDATES TO DIRECT AND INDIRECT CARBON INTENSITY VALUES AND PARAMETERS

DIRECT/ INDIRECT EMISSIONS	MODEL	FEEDSTOCK	UPDATE NEEDED	CURRENT VALUE/CI	UPDATED VALUE/CI	REFERENCE/COMMENTS
INDIRECT	GTAP-BIO	Soy	Various, as shown below	**29.1 g/MJ**	**17.5 g/MJ**	
			Using model parameters recommended by GTAP developers	**29.1** →	22.4	Follow-On Study of Transportation Fuel Life Cycle Analysis: Review of Current CARB & EPA Estimates of Land Use Change Impacts http://crcsite.wpengine.com/wp-content/uploads/2019/05/E-88-3b-Final-Report-2016-08-23_v2.pdf
			Updating to 2017 GTAP model (includes intensification changes) and 2011 data base.	22.4 →	18.3	Taheripour, F., Cui, H. and Tyner, W.E., 2017. An Exploration of agricultural land use change at the intensive and extensive margins: implications for biofuels induced land use change. Bioenergy and Land Use Change, pp.19-37. https://doi.org/10.1002/9781119297376.ch2 Taheripour, F., Zhao, X. and Tyner, W.E., 2017. The impact of considering land intensification and updated data on biofuels land use change and emissions estimates. Biotechnology for biofuels, 10(1), p.191. https://biotechnologyforbiofuels.biomedcentral.com/track/pdf/10.1186/s13068-017-0877-y
			Including feed-land substitution in GTAP	18.3 →	**17.5**	Taheripour, F. and Tyner, W.E., 2020. US biofuel production and policy: implications for land use changes in Malaysia and Indonesia. Biotechnology for Biofuels, 13(1), p.11. https://link.springer.com/content/pdf/10.1186/s13068-020-1650-1.pdf

POST-2015 UPDATES TO DIRECT AND INDIRECT CARBON INTENSITY VALUES AND PARAMETERS

DIRECT/ INDIRECT EMISSIONS	MODEL	FEEDSTOCK	UPDATE NEEDED	CURRENT VALUE/CI	UPDATED VALUE/CI	REFERENCE/COMMENTS
INDIRECT	GTAP-BIO	Canola	Various, as shown below	**14.5 g/MJ**	**11.7 g/MJ**	
			Using model parameters recommended by GTAP developers	**14.5**		Follow-On Study of Transportation Fuel Life Cycle Analysis: Review of Current CARB & EPA Estimates of Land Use Change Impacts http://crcsite.wpengine.com/wp-content/uploads/2019/05/E-88-3b-Final-Report-2016-08-23_v2.pdf
			Updating to 2017 GTAP model (includes intensification changes) and 2011 data base.			Taheripour, F., Cui, H. and Tyner, W.E., 2017. An Exploration of agricultural land use change at the intensive and extensive margins: implications for biofuels induced land use change. Bioenergy and Land Use Change, pp.19-37. https://doi.org/10.1002/9781119297376.ch2 Taheripour, F., Zhao, X. and Tyner, W.E., 2017. The impact of considering land intensification and updated data on biofuels land use change and emissions estimates. Biotechnology for biofuels, 10(1), p.191. https://biotechnologyforbiofuels.biomedcentral.com/track/pdf/10.1186/s13068-017-0877-y
			Including feed-land substitution in GTAP		**11.7**	Results have not been published for US canola biodiesel shock but similar percentage reductions can be expected for canola as were found for soy oil

September 3, 2021

Richard Corey, Executive Officer
California Air Resources Board
P.O. Box 2815
1101 I Street
Sacramento, CA 95814

Re: NBB Comments on 2022 GHG Scoping Plan Scenario Concepts

Dear Mr. Corey:

Thank you for the opportunity to provide comments on the 2022 GHG Scoping Plan Scenario Concepts (held August 17, 2021), which will be used to inform modeling on various strategies to achieve carbon neutrality by 2035 or 2045. The National Biodiesel Board (NBB) is the U.S. trade association representing the entire biodiesel and renewable diesel value chain, including producers, feedstock suppliers, and fuel distributors. The California Advanced Biofuels Alliance (CABA) is a not-for-profit trade association promoting the increased use and production of advanced biofuels in California. CABA has represented biomass-based diesel (BMBD) feedstock suppliers, producers, distributors, retailers, and fleets on state and federal legislative and regulatory issues since 2006. The NBB and CABA offer the following comments for your consideration. Our comments build on the previous NBB comments submitted in July 2021.

We understand CARB has requested comments by September 3, 2021; we are working on modeling to derive specific, pre-2030 carbon intensity targets but anticipate that work will take additional time. Once completed, we will submit for CARB's consideration the results of that work to supplement our comments in this letter.

Essentially, the August 17th workshop poses the question of whether CARB's climate programs, including the state's Low Carbon Fuel Standard (LCFS), should be revised to incorporate accelerated carbon intensity (CI) reduction targets pre- and post-2030. NBB and CABA believe seeking more aggressive CI targets is appropriate to help the state achieve its GHG and carbon neutrality goals and offers the following comments in support of that position.

Missouri Headquarters
605 Clark Ave.
PO Box 104898
Jefferson City, MO 65110
(800) 841-5849

Washington, D.C. Office
1331 Pennsylvania Ave., NW
Suite 505
Washington, DC 20004
(888) 246-3437

California Office
1415 L Street
Suite 460
Sacramento, CA 95814
(916) 760-8870

Massachusetts Office
36 Jonspin Road
Suite 235
Wilmington, MA 01887
(978) 267-3020

www.nbb.org www.biodiesel.org

Avoiding and Reducing New Anthropogenic Carbon Emissions Is Key to Achieving Carbon Neutrality

It is a truism that bears repeating: To achieve carbon neutrality, new carbon emissions must be eliminated or reduced to the maximum extent feasible. The use of petroleum fuels in transport continues to be the largest source of anthropogenic emissions in California, so strategies to address climate change and achieve carbon neutrality as quickly as possible must have, at a minimum, the goal of eliminating, or reducing to the maximum extent feasible, the use of petroleum fuel[1]. While the current LCFS carbon intensity (CI) reduction targets of 10% by 2022 and 20% by 2030 are aggressive, we believe even more stringent CI reduction targets are feasible in the 2025-2035 timeframe.

CABA's 2030 Roadmap Outlines a Pathway Toward Elimination of Petrodiesel by 2030

Released in February 2019, the CABA 2030 Roadmap[2] provides a good starting point[3] for exploring pathways that can lead to a substantial reduction or even elimination of petroleum diesel use in California's transportation sector by 2030. The Roadmap assumes the current trend of companies switching vehicles from liquid petroleum diesel fuel into renewable natural gas, electricity and hydrogen will accelerate in the years ahead.[4] With the increasing use of these alternative fuels and continuing vehicle efficiency gains, the Roadmap projects that demand for liquid diesel fuels will decrease from today's current 3.6 billion gallons to approximately 3.4 billion gallons by 2030 (Fig. 1). Thus, approximately 3.4 billion gallons of sustainable biodiesel and renewable diesel[5] (collectively known as biomass-based diesel) would be needed in California to completely displace the remaining demand for liquid fuel in the California diesel market (i.e., the medium and heavy duty transportation sector). The Roadmap yields a liquid diesel fuel pool composition of 80 percent renewable diesel and 20 percent biodiesel at the 2030 endpoint.

---

[1] Transition from petroleum fuel use in transportation and other sectors has also been identified as an objective in Governor Newsom's EO N-79-20 and other executive orders.

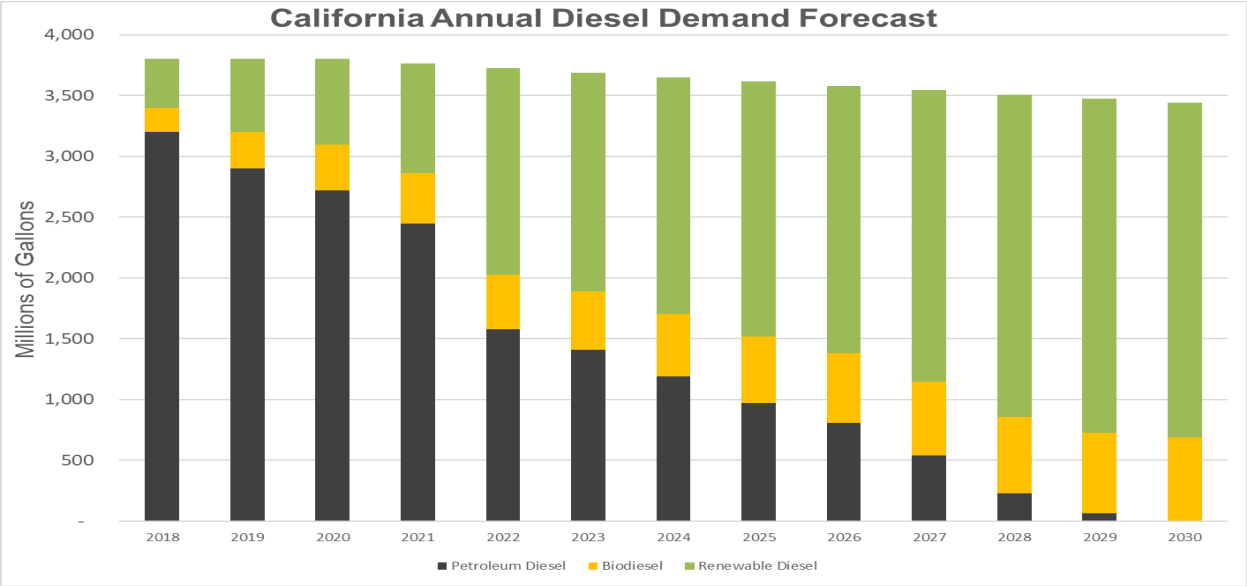
[2] CABA 2030 Roadmap, https://a28e0892-6205-4975-9273-0eef57303b07.filesusr.com/ugd/8efc2e_0dce73a10967444895bfa0128fcd1ef4.pdf, accessed 9/1/2021.

[3] Application of the CABA 2030 Roadmap to CARB's proposed 2022 Scoping Plan modeling would likely require some updates to the Roadmap inputs and assumptions to reflect industry and market developments that have occurred since publication of the Roadmap. Nonetheless, the Roadmap remains useful as a starting point for the intended modeling.

[4] CABA 2030 Roadmap at 3.

[5] Biodiesel and renewable diesel are among the most sustainable transportation fuels available, made from a wide variety of waste and by-product feedstocks such as used cooking oil, distillers corn oil, rendered animal tallow, and lipid byproducts of soy and canola protein production. Biodiesel is produced from such feedstocks through a chemical process called transesterification. By contrast, renewable diesel is made from the same types of sustainable feedstocks but through essentially the same processes as those used in current petroleum refineries.

Fig. 1 Biomass-based Diesel Provides the Bulk of Transportation Fuel Carbon Reductions



CABA 2030 Roadmap at 2.

Feasibility of 3.4 Billion Gallons of Renewable Diesel and Biodiesel in California by 2030

Much of the recent news involving renewable diesel (RD) has focused on numerous announcements of new or expanded RD production. Based on those announced and developing projects, the Energy Information Agency (EIA) forecasts that the U.S. could have 5.1 billion gallons of renewable diesel production capacity by 2024[6], up from the current 0.91 billion gallons of production capacity[7]. Even if only half (about 2.7 billion gallons) of that announced capacity comes online by 2030, the 3.4 billion gallons of biomass-based diesel needed to displace petroleum diesel would be achievable through the use of that 2.7 billion gallons of renewable diesel coupled with approximately 700 million gallons of biodiesel[8,9]. This is well within the current U.S. biodiesel production capacity of 2.4 billion gallons of biodiesel[10].

[6] U.S. Energy Information Administration, https://www.eia.gov/todayinenergy/detail.php?id=48916, accessed Sept. 1, 2021.
[7] U.S. Energy Information Administration, https://www.eia.gov/biofuels/update/table1.pdf, accessed Sept. 3, 2021.
[8] Note that Bob Nelson, Senior Analyst, Jacobsen Fastmarkets, projected 3.16 billion gallons of renewable diesel production capacity from plants under construction or otherwise with an estimated 50% or greater probability of coming online within the next few years. The Jacobsen Fuel & Feedstock Conference 2021, Denver, Colorado, Aug. 25-26, 2021.
[9] 2.7 billion gallons of renewable diesel (assuming virtually all of it goes to California as it currently does) and 700 million gallons of biodiesel would yield an overall fuel pool composition of 80% renewable diesel and 20% biodiesel (R80/B20).
[10] U.S. Energy Information Administration, https://www.eia.gov/biofuels/biodiesel/capacity/. It should be noted that the National Biodiesel Board's feedstock analysis provided the basis for its 2020 Vision, which projects the use

Deep Electrification is Appropriate but Not Enough

The state's aggressive effort to electrify as many sectors as quickly as possible is laudable and an appropriate element in any well-designed strategy to address climate change. However, as other Scoping Plan workshop attendees have observed, that "silver bullet," single technology focus on electrification glosses over the fact that deep electrification, especially in the heavy duty transportation sector, is many years if not decades away[11]. From a climate impact standpoint, waiting for the carbon reductions to be achieved through long-term measures like deep electrification ignores a critically important consideration -- the time value of carbon. Put simply, substantial reductions in carbon emissions now are vastly superior from a climate impact standpoint than the same reductions occurring many years in the future. Preventing an anthropogenic CO_2 emission today ensures we avoid the induced radiative forcing for the critical years to come. The need to reduce carbon emissions deeply and immediately to avoid the worst effects of climate change was recently underscored by the August 2021 release of the Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report[12].

Further, a number of workshop attendees, including members of the Environmental Justice Advisory Committee (EJAC), also questioned the Scoping Plan Update's focus on reaching carbon neutrality in 2045 when the state has not yet shown how it would reach the earlier 2030 target while reducing important criteria and toxic emissions affecting the residents of disadvantaged and EJ communities. A more comprehensive approach is needed, one that not only looks down the road to 2045 and beyond, but also fills in the years between now and then with meaningful measures and policies that achieve both carbon reductions and improvements in public health in the years while the state waits for an electrified future.

---

of 6 billion gallons or more of biodiesel, renewable diesel, and sustainable aviation fuel by 2030. See NBB Vision 2020, visited 9/1/2021.

[11] The rulemaking record for CARB's recently adopted Advanced Clean Trucks regulation, touted to be significantly more aggressive than the original staff proposal, suggests around a 10% penetration of electric Class 7-8 heavy duty trucks by VMT by 2040, a class which represents the largest share of HDV emissions from the heavy duty sector and is also among the most difficult to electrify. See Appendix D of the ACT Initial Statement of Reasons. Current EMFAC 2021 modeling suggests up to about 20% penetration in Class 7-8 of electric heavy duty trucks. See https://arb.ca.gov/emfac/emissions-inventory/e3bf31fc713b4b13169733c0edd3a62e45d97d3c. This inherent difficulty in electrifying the heavy duty sector is also recognized in the Governor's Executive Order N-79-20, which includes the caveat "where feasible" in a number of directives to state agencies when pursuing actions to achieve zero emissions in medium and heavy duty vehicle operations by 2045.

[12] IPCC AR6, available at https://www.ipcc.ch/assessment-report/ar6/.

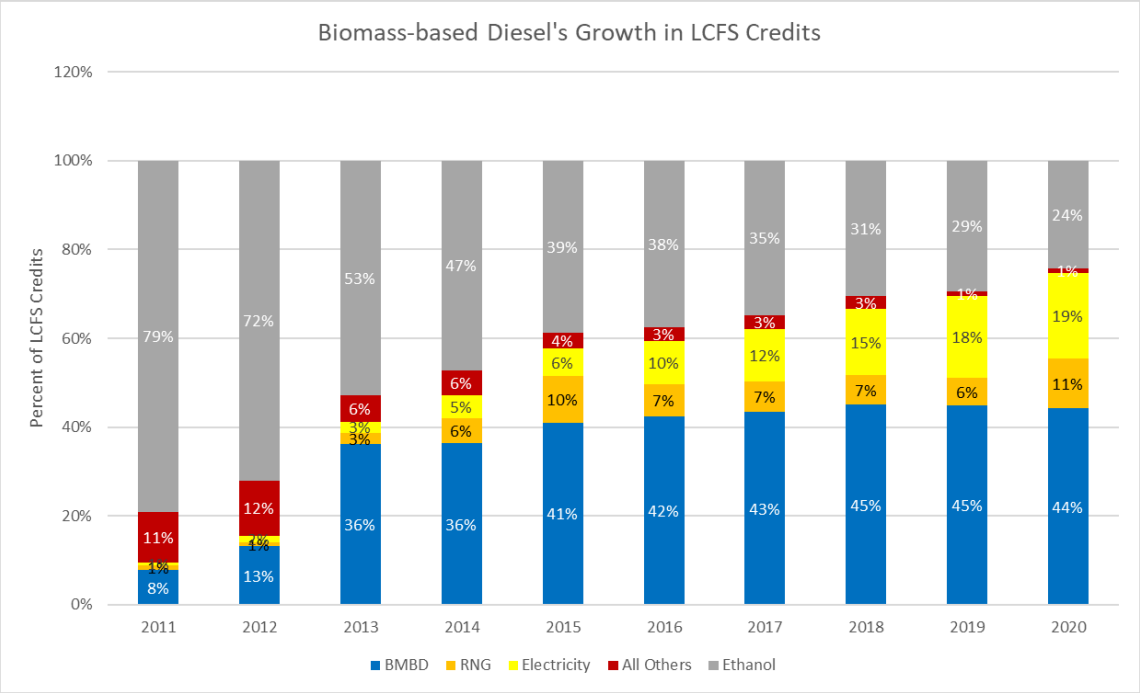
Immediate Carbon Reductions are Available through Use of Drop-In Biofuels Now While the State Pursues Deep Electrification

The state can and should do better. Biomass-based diesel is a drop-in solution available right now, which can provide immediate and continuing reductions in carbon emissions (upwards of 86%[13] or more, on par with electricity). These sustainable diesel replacements are already providing the bulk of the state's carbon reductions under its LCFS program. This success has been partly enabled by the fuel's compatibility with existing infrastructure. Biomass-based diesel has reduced carbon emissions by more than 32.3 million metric tons in California since 2011, 6.8 million metric tons in 2020 alone, equivalent to removing more than 1.4 million cars off the road last year. These substantial GHG reductions have helped California reach its 2020 GHG targets four years ahead of schedule[14] and continue reducing emissions below the 2020 target[15], and they can play a similar role in meeting the 2030 and 2045 targets and beyond.

Biomass-based diesel has played a key role in the LCFS, providing nearly half (45%) of the LCFS carbon reductions over the last three years and 42% overall since 2011[16] (Fig. 2), more than renewable natural gas and electricity combined. These sustainable diesel replacements have grown from a mere 14 million gallons in 2011 to nearly 900 million gallons in 2020[17] (a 6100% growth), so that nearly a quarter (24%) of the diesel fuel pool now comprises biomass-based diesel. And that growth is expected to continue as California progresses toward its 20% carbon intensity reduction target in 2030. Indeed, the University of California at Davis has identified the need for up to 60-80% of the diesel fuel pool in California to be replaced by biomass-based diesel if California is to achieve its 2030 target[18] in the absence of deep electrification.

[13] Depending on the feedstocks used, BMBD have been scored in California with carbon intensity as low as 8-16. See CA LCFS certified "Current Fuel Pathways", accessed Oct. 31, 2020.
[14] California Air Resources Board press releases, https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time, accessed Oct. 31, 2020.
[15] California Air Resources Board press release, https://ww2.arb.ca.gov/news/latest-state-greenhouse-gas-inventory-shows-emissions-continue-drop-below-2020-target,, accessed Sept. 1, 2021.
[16] CARB LCFS Dashboard, opt cit.
[17] Ibid.
[18] Bushnell et al. (Feb. 2020), "Uncertainty, Innovation, and Infrastructure Credits: Outlook for the Low Carbon Fuel Standard Through 2030," University of California Institute of Transportation Studies, at v.

Fig. 2 Biomass-based Diesel Provides the Bulk of Transportation Fuel Carbon Reductions



Source: LCFS Dashboard, 4/30/21, https://ww3.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm.

The growth in California of biomass-based diesel translates to displacement of more than 3.9 billion gallons of petroleum diesel since 2011. In other words, the use of biomass-based diesel has avoided adding to the atmosphere the anthropogenic carbon emissions resulting from nearly 4 billion gallons of displaced petroleum diesel since the LCFS started. The state can and should do more to incentivize even more displacement of petroleum diesel through the use of biomass-based diesel.

Immediate Reductions in Emissions Harmful to Public Health are Available through the Use of Drop-In Biofuels Now While the State Pursues Deep Electrification

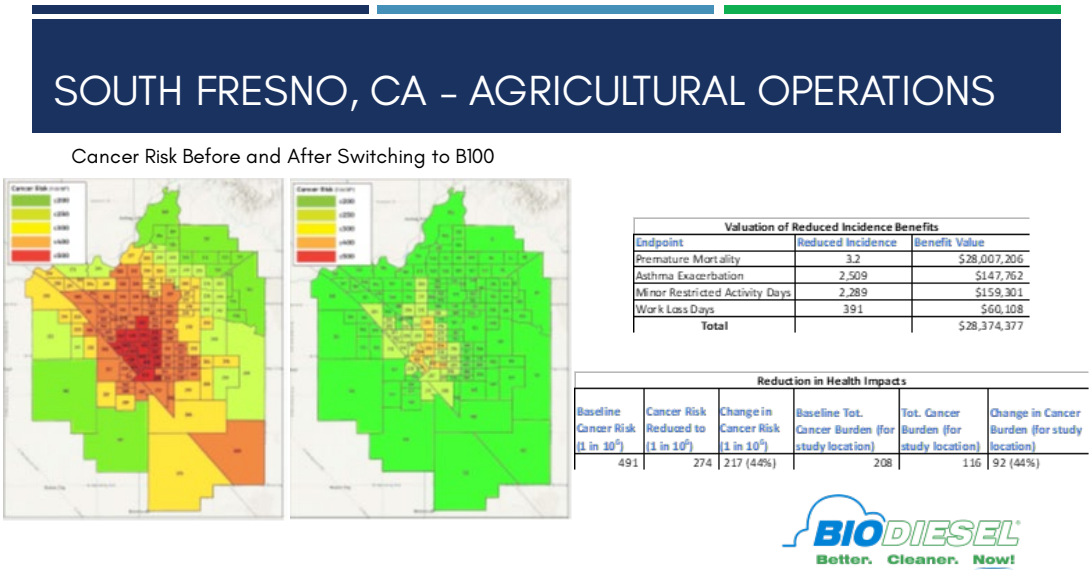
As noted, biomass-based diesel provides important and substantial carbon reductions now and will do so in the years to come. But just as important, these fuels reduce diesel particulate matter and other toxic emissions that are harmful to human health. Thus, NBB and CABA believe the maximum level of benefits from these fuels can and should be pursued by the state while California pursues widespread electrification. The use of biomass-based diesel in the state's existing fleet of legacy heavy duty vehicles provides an immediate improvement in the health of California's local communities. This has been shown by the groundbreaking Trinity Consultants study[19] recently commissioned by NBB. That study quantified the public health

[19] Available at: https://www.biodiesel.org/news-resources/health-benefits-study.

benefits at the neighborhood/census tract level of switching to biodiesel in 13 sites on both coasts and Colorado, including four in California, showing that such a switch would reduce or avoid:[20]

- 370 cancer cases (a 45% reduction in cancer risk, see Fig. 3 as an example)
- 230 premature deaths per year
- 150,000 asthma attacks per year
- 31,000 work loss days per year
- $2.0B health costs per year.

Fig. 3. Projected Cancer Risk Reduction and Other Health Benefits by Switching to Biodiesel



These benefits are especially important for disadvantaged and EJ communities, many of which are located at or near sites that still use high levels of petroleum diesel. At these sites, there are significant numbers of legacy vehicles that can benefit from the reduced DPM emissions which biomass-based diesel provides. These sustainable diesel replacements would benefit even the more modern, 2010 and newer engines by reducing their GHG emissions and particle loading of the diesel particulate filters, thereby improving their longevity and maintenance.

<u>Further Decarbonization through Expanded Use of Biomass-based Diesel</u>

NBB has been fully supportive of efforts to address climate change and has been a strong partner in California, Oregon, Washington and many other states that have developed or are

[20] Wilmington, Carson, West Long Beach near the Port of L.A./Long Beach; San Bernardino; South Fresno; and West Oakland.

developing programs to reduce climate impacts from the use of petroleum fuels. We applaud CARB's efforts to update the Scoping Plan to establish a roadmap toward the laudable goal of further reducing carbon and toxic air emissions. To this end, NBB has previously provided comments on the need to update the carbon scoring mechanism in the LCFS program to reflect the latest science, correct errors, and reflect learnings gained since the regulation was last amended in the 2015 and 2018 rulemakings[21]. We appreciate CARB's commitment to using the most robust and up-to-date science in the LCFS program and believe the updates outlined in our previous comments would make the program even more solidly grounded in the most up-to-date science.

Further, the Scoping Plan workshop on natural and working lands makes it clear the state will need to find ways to incentivize best practices that reduce carbon emissions in farming operations and further increase soil organic carbon. NBB believes its farmer members employ some of the most sustainable land management practices in the world. We strongly encourage CARB staff to work with NBB farmer members and others in this space, who have the expertise and experience to provide important insights that can inform California's efforts to reach carbon neutrality. We would be happy to collaborate with CARB staff and other agencies on ways to identify, quantify, and incentivize practices and technologies that improve carbon reduction and soil organic carbon, including providing a more direct market signal to farmers that encourage and expand such practices. Finally, we encourage CARB staff and other agencies to work with farmers and other land managers as the state develops methods to validate any changes in the level of soil organic carbon.

Conclusions

The biomass-based diesel industry, and more recently the growing sustainable aviation fuel sector, have been strong champions of California's efforts to address climate change. We applaud California's efforts to achieve carbon neutrality and, toward that end, believe CARB should continue strengthening the LCFS to achieve even greater carbon and air pollution reductions. Based on our analysis, we suggest that CARB conduct its Scoping Plan modeling with 3.4 billion gallons of biomass-based diesel in the 2030-2035 timeframe. We also strongly encourage CARB staff to update the LCFS to reflect the best available science, including direct observational data as we have previously requested. We appreciate the good working relationship we have developed with CARB over many years and look forward to working cooperatively and productively as you proceed with the Scoping Plan Update.

[21] See NBB's Nov. 11, 2020, comment letter on the next round of LCFS rulemaking, https://www.arb.ca.gov/lists/com-attach/120-lcfs-wkshp-oct20-ws-WjQCZgBjUV0FYFM8.pdf, incorporated herein by reference.

Adoption of these recommendations will help ensure that biomass-based diesel fuels will continue to play the strong role they have played historically and must continue to play while California works toward a much lower carbon future.

Sincerely,

Floyd Vergara, Esq., P.E.
Director of State Governmental Affairs
National Biodiesel Board

Rebecca Baskins
Executive Director
California Advanced Biofuels Alliance