



September 4, 2017

Sam Wade, Branch Chief
Industrial Strategies Division
California Air Resources Board
1001 I Street, PO Box 2815
Sacramento, CA 95812

Re: Low Carbon Fuel Standard (LCFS) 2018 Amendments: Pre-Regulatory Concept Paper

Dear Mr. Wade:

On behalf of Natural Resources Defense Council (NRDC) and our more than two million members and online activists, we respectfully submit these comments on staff's concept paper covering potential regulatory amendments for 2018 and beyond. We thank you for your commitment to cleaner, healthier air for all Californians and for your international leadership in protecting current and future generations from the impacts of climate pollution.

The LCFS is a critical component of AB 32, California's Global Warming Solutions Act of 2006 and represents one of the state's largest greenhouse gas (G)G emission reduction measures. With the recent passage of SB32 (Pavley) and AB197 (Garcia), the LCFS will continue to be a key regulatory program to enabling the state to achieve new state mandates requiring GHG emissions to be reduced 40 percent below 1990 levels by 2030. As such, the program provides the necessary foundation for meeting California's existing health-based air quality and climate goals, and puts the state on a path for meeting its long-term goals with deeper emissions cuts. The program is establishing a direct, long-term regulatory structure to transform our fuel supply to:

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- Enable a switch from high carbon fuels to ultra-low carbon fuels
- Ensure continued reductions from all existing fuels, and
- Protect against crude oil getting even dirtier over time and offsetting progress being made in the transportation sector.

ARB is appropriately considering the stringency of the LCFS program beyond 2020. We provide these comments for your consideration as staff develops proposed regulatory amendments.

1. ARB is appropriately considering a higher stringency level for 2030 and should consider scenarios beyond an 18% reduction in carbon-intensity.

Under ARB's "2017 Climate Change Scoping Plan Update," staff analyzed various scenarios that could achieve the state's mandate to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030.¹ The lower-end scenario for a LCFS was at least an 18 percent reduction in carbon-intensity by 2030 while an upper-end scenario was included to show a 25 percent reduction in carbon-intensity by 2030.

The 18 percent LCFS scenario was accompanied by other regulatory policies including a 20 percent reduction measure on refinery emissions, together with a strong cap-and-trade program. In the 25 percent LCFS scenario, it was assumed cap-and-trade would no longer be implemented beyond 2020, and that a refinery measure resulting in 30 percent emissions reduction would be included as well as a specific, low-emission diesel standard.

The signing of AB 398 (Garcia) this year also made the cap-and-trade program as the primary rule for petroleum refineries to achieve their greenhouse gas emissions, while also codifying ARB's authority to adopt, maintain, or revise the LCFS among other programs. Since the refinery emission reduction measures accompanying the 18% LCFS scenario will no

¹ ARB (2017), *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target*. January 20, 2017, https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf: last viewed 9/4/2017.

longer be implemented, we urge ARB to include in its analysis several additional scenarios above the 18% stringency level, including a 20% and 22% carbon-intensity reduction scenario by 2030 in addition to the 25% upper-end scenario. Consideration of higher levels for the LCFS stringency will also help ensure that the 2030 statewide reduction measures will be more likely to be met.

Finally, we recommend that staff consider several sensitivities in determining the appropriate stringency level, guided by its current fuel and feedstock evaluation. These include:

- *Petroleum demand*: Potential overall gasoline and diesel consumption in California could increase or decrease faster than expected which can affect the alternative fuel and feedstock volumes required for a given percent carbon-intensity (CI) standard level. Since the transition to a lower-carbon fuel supply in 2030 will be potentially more rapid and uncertain than the pathway to 2020, ARB should work to consider whether current mechanisms are sufficient or need to be enhanced to account for variability in petroleum consumption.
- *Cumulative GHG emission reductions*: The cumulative GHG emission reductions may be just as important as the annual and 2030 targets. Similar cumulative GHG emissions may be achieved for various endpoints (e.g. 18%, 22%, or 25%) depending on the emission reductions pathway. ARB should incorporate assumptions around availability and timing in determining specific carbon-intensity requirements for the years between 2020 to 2030 and include as a metric cumulative GHG emission reductions in its proposal.
- *Application and crediting of new technology pathways*: ARB should look to develop reasonable estimates of new technologies, feedstocks, or fuel pathways that may be included and credited under the standard over the 2020 to 2030 timeframe. These technologies may involve carbon capture and sequestration (CCS), alternative fuels for aviation, lower-carbon feedstocks or processes, and additional electrification pathways.

2. We support alternative jet fuel (AJF) producers generating LCFS credits under the program provided they have acquired sustainability certification.

Currently, aviation and marine bunker fuels are not regulated under the LCFS. Inclusion of these fuel providers as opt-in credit generators, without actual LCFS requirements or deficits applied to aviation and bunker fuels, serve functionally to offset the overall program requirements for low-carbon fuels from the on-road fuels market.

That said, we see positive benefits to including the aviation and marine bunker fuels as opt-in credit generators to (1) expand the market for sustainably certified fuels and (2) enable increased low-carbon fuel use in the market for bunker fuels (despite the reduced value for the on-road fuels market).

Since there are currently no requirements on jet fuels, ARB should allow valuable credits to be generated for those fuels provided entities are utilizing sustainable aviation jet fuel as certified by the Roundtable on Sustainable Biomaterials (RSB) or equivalent system. NRDC is confident that inclusion of sustainability certification will not be a barrier as twenty-eight airlines, ranging from Virgin America to United Airlines to Singapore Airlines, representing a third of the global aviation fuels market have signed and committed to accelerating and commercializing sustainable aviation biofuels with criteria consistent and complementary to internationally-recognized standards such as those developed by the RSB.² Companies such as United Airlines have now partnered with Honeywell UOP and AltAir Fuels to produce renewable jet fuel, with AltAir Fuels is currently pursuing RSB certification.³ Other new fuel providers, such as LanzaTech, are currently supplying Virgin Atlantic from a RSB certified facility.⁴ The inclusion of AJF as an "opt-in" credit generator provides an opportunity to leverage the aviation's industry longer-term procurement capability and its commitment to sustainability certification.

While potentially a smaller market, ARB should also consider inclusion of marine bunker fuels in a similar fashion should interest be expressed and based on the experience with aviation bunker fuels.

² <http://www.safug.org/safug-pledge/> (last viewed 9/4/2017).

³ <https://www.united.com/web/en-US/content/company/globalcitizenship/environment/alternative-fuels.aspx> (last viewed 9/4/2017).

⁴ <http://www.lanzatech.com/low-carbon-fuel-project-achieves-breakthrough/> (last viewed 9/4/2017).

3. We support ARB's efforts to add a third-party verification system to ensure the integrity of the LCFS is maintained

The value of the LCFS credits have increased to become one of the most valuable markets globally for GHG emission reduction activities. ARB is taking the right steps toward developing third-party verification to ensure validation and verification of the performance of fuel pathways from registered party. The large flexibility provided to regulated entities to reduce carbon-intensities also creates its own risks in terms of misreporting in ways that result in lower-than-justified carbon-intensity scores. Although not without some additional administrative costs, providing both the regulated community, stakeholders and policymakers with additional assurance of the on-going and future LCFS program integrity highly outweighs those additional administrative costs.

As ARB considers selection criteria for International Certification Systems (ICS), we point staff to significant work over the years at evaluating and ranking the various ICS programs as well as the aviation industry, under our report *Cleaner Skies are Friendlier Skies: NRDC's 2016 Aviation Biofuel Scorecard* as well as our comparison of various certification systems under *Biofuel Sustainability Performance Guidelines*.⁵

4. We support ARB staff continuing to use the best-available technical and scientific information to update GREET, OPGEE, and fuel pathway assumptions

We support ARB staff continuing to update the CA-GREET and OPGEE models as identified in the concept paper, both of which are utilized for calculation of the fuel pathways.

For electricity and hydrogen-based pathways, we also support ARB updating the "Energy Efficiency Ratios" (EER) as new data for electric and fuel cell light, medium, and heavy duty vehicles and equipment is collected. For example, a new report by NREL on the efficiency of

⁵ <https://www.nrdc.org/sites/default/files/aviation-biofuels-sustainability-report-2016.pdf> and <https://www.nrdc.org/resources/sustainability-certification-biofuels> (last viewed 9/4/2017).

electric buses used by Foothill Transit has been issued since the LCFS re-adoption in 2015.⁶ We also support the inclusion of additional, nonroad mobile sources under the program such as airport equipment.

Given the rapid changes observed in the electricity sector with the current requirements under SB350 (De León) establishing a 50% Renewable Portfolio Standard by 2030 and now, the legislature considering a 60% RPS by 2030 and a 100% goal to be established, we support ARB moving toward a system that updates the carbon-intensity score for electricity on an annual basis. NRDC also supports ARB considering potential rules to account for regulated parties seeking increased credits for use of 100% renewable electricity when charging vehicles, so-long as appropriate criteria and verification is provided. We support ARB's principles around ensuring that any additional credits for 100% renewable generation utilized is shown to directly charge vehicles, the renewable generation is above-and-beyond the current RPS requirements (i.e. not already generating Renewable Energy Credits), and the entities undergo verification procedures.

5. We continue to support the refinery investment credit pilot program, but continue to remain strongly opposed for crediting for switching to lighter crude oils

In June 19, 2015, NRDC together with the United Steelworks and Blue-Green Alliance submitted a letter to you in support of including a refinery investment pilot program as part of the LCFS re-adoption. We collectively stated that "credits for refinery improvements represent a significant opportunity to spur additional investments that improve the environmental performance of refineries and that create secure refinery jobs, while reducing the carbon intensity of transportation fuels and fostering additional benefits such as reductions in criteria pollution."⁷

⁶ <https://www.nrel.gov/docs/fy16osti/65274.pdf> (last viewed 9/4/2017).

⁷ NRDC, United Steelworks, and Blue-Green Alliance joint letter to Sam Wade, June 19, 2015.

In an earlier joint letter by the same group (July 10, 2014) to Mike Waugh, the same group provided our recommendations around program design principles.⁸ These included:

- Crediting for projects that go “above-and-beyond” business as usual by avoiding crediting normal maintenance and focusing the provision on investments in inherently cleaner technologies.
- Crediting for new projects going forward as opposed to retroactively crediting of projects that would have occurred anyhow absent the LCFS.
- Expanding the system boundaries in assessing projects as widely as possible to capture net emissions reductions (e.g. including any offsetting effects such as increased energy use from for instance, a new technology)

As ARB considers increasing refinery access to the crediting provisions, we urge inclusion of analysis, examples, and clarification of how updates to the provisions will ensure the above design goals are still met.

Treatment of lighter and heavier crude oils

In prior amendments to the LCFS, the treatment of heavier and lighter crude oils (as encompassed by high-carbon intensity crude oils and lower-carbon intensity crude oils) was an area of intensive discussion and debate among stakeholders. Ultimately, to address industry concerns around “crude shuffling” while attempting to balance concerns about high-intensity crude oils offsetting LCFS emission reductions, ARB chose to utilize a state-wide, moving average approach for the petroleum baseline versus a refinery-specific crude oil accounting approach. In the concept paper, ARB appears to be considering potential inclusion of refinery projects to process lighter crude oils for crediting. We strongly oppose this direction on numerous grounds, including:

- The general inappropriateness in lieu of prior discussions and decisions to not assign crude oil deficits on a refinery-basis

⁸ https://www.arb.ca.gov/fuels/lcfs/regamend14/uswnrdcbga_07102014.pdf and included as a supplement (last viewed 9/4/2017)

- The switch to lower CI crude oils (or higher CI crude oils) being captured already in the statewide averaging approach for the petroleum baseline
- The shifts being driven simply by economics and “price advantaged” crude oils versus any permanent or purposeful investment to reduce carbon-intensity or to invest in inherently cleaner technologies.

Below, we note NRDC and Communities for a Better Environment’s earlier joint letter on this matter which is also attached as a supplement.

We oppose providing LCFS credits for merely shifting to a lighter oil crude oil slate without demonstrating direct, additional and permanent carbon emission reductions.

Currently, a number of California refineries are positioning themselves to increase their supplies of Bakken tight oil (generally lighter), presumably because these are currently “price advantaged” crude oils. Such shifts are typically ephemeral, not additional or permanent. Simply crediting for these shifts – which do not reflect investments to reduce carbon emissions permanently -- could significantly undermine the LCFS requirements and should not receive credits. (NRDC and CBE, November 5, 2013).⁹

In closing, we thank ARB staff for their hard work and consideration of complex policy issues related to the growth of the low-carbon fuels market and transformation of the transportation sector. We look forward to continuing to engage around these and other issues as ARB looks to amend the program next year. Please contact me for any questions or clarification.

⁹ Letter to Richard Corey from Natural Resources Defense Council and Communities for a Better Environment, November 5, 2013.

Best regards,

Simon C. Mui

Simon Mui, Ph.D.

Senior Scientist

NATURAL RESOURCES DEFENSE COUNCIL

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July 10, 2014

Mike Waugh, Chief, Transportation Fuels Branch
California Air Resources Board
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P.O. Box 2815
Sacramento, CA 95812

Re: Comments on the Refinery Provisions to Low Carbon Fuel Standard presented at the April 18, 2014 CARB Workshop

Dear Mr. Waugh:

The BlueGreen Alliance, Natural Resources Defense Council and United Steelworkers join to thank you and other CARB staff for your efforts to improve the Low Carbon Fuel Standard (LCFS) as part of its re-adoption process. We remain strong supporters of AB 32 and the LCFS, which is reducing the carbon intensity of our transportation fuels and transforming the industry.

Our support of the LCFS rests in our shared interest to address today's environmental challenges in ways that can create and maintain quality jobs and a stronger, fairer economy. We are guided by the principle that Americans deserve both environmental sustainability and economic prosperity. We should not have to choose between them and instead, we can and must implement solutions to ensure the health of people and our environment while also strengthening our economy.

To that end, we support CARB's efforts to establish a cost containment mechanism and LCFS pathways for refinery improvements. In light of the various new pathways and other LCFS changes CARB is considering, a cost containment mechanism (CCM) should be viewed as a safety valve. In developing a CCM, CARB should evaluate how it would provide compliance certainty for refineries under a variety of scenarios, and how refineries can return to regular compliance in the following years after a CCM is triggered.

We also support CARB moving forward to implement refinery improvement pathways to foster new investments that are above-and-beyond other requirements or business-as-usual, and result in real, verifiable additional reductions. More specifically, we support the following concepts:

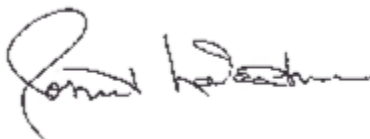
- **A Cost Containment Mechanism should be linked to a process or plan to ensure future compliance with the LCFS.** A CCM can result in a more robust and resilient program if well designed. After evaluating five potential options, CARB staff is narrowing down to either a "credit window" or "credit clearance" option, the latter establishing a clearance process for excess credits followed by providing additional time for regulated parties to carry over deficits to the next compliance period. This will allow for greater certainty for all parties in terms of their maximum compliance costs,

providing flexibility if reduction opportunities are too limited in a given year, while ensuring the signal to invest in emission reductions remain. ARB should also consider how the mechanism would work under a variety of scenarios and whether refineries should provide ARB with investment plans to make up any deficits accrued.

- **Credits for GHG emission reductions for refinery improvement projects should be tied to net reductions in carbon intensity.** We believe credits for refinery improvements represent a significant opportunity to spur additional investment in refineries and create refinery jobs, while reducing the carbon intensity of transportation fuels and fostering additional benefits such as reductions in criteria pollution. CARB staff has proposed a project-based approach that has the advantage of being discrete and customizable for individual refineries. This approach may be appropriate in light of the large emission variations between refineries—between four grams to nearly 18 grams per mega joule. However, ARB should ensure that net reductions in carbon intensity at a refinery are credited under any project-based approach, so that one project improvement is not offset by another project that increases carbon intensity. Credits associated with refinery project improvements should only be granted when there is a net reduction in carbon intensity at the refinery-level.
- **To earn credits, refinery improvement projects should be above-and-beyond business as usual.** We believe the LCFS, in calling for a 10 percent reduction in the carbon intensity of fuels, should spur investment and innovation that address climate change while creating new jobs and protecting existing jobs. Rewarding “business as usual” or for past projects that have already been completed or are part of normal maintenance or industry practice should not generate LCFS credits. CARB should ensure credits are granted only to new projects that generate emission reductions from improvements beyond routine maintenance and operations or compliance with other requirements.
- **Only projects implemented in 2015 or later should be eligible for credits.** Granting credits for past projects undermines our position that refinery improvements associated with LCFS credits should spur “additional” projects to reduce GHG emissions. As a result, we support CARB staff’s recommendation to limit credits only to projects implemented in 2015 or later.
- **We support the LCFS awarding credits to producers and project developers that invest to reduce emissions from the oil production process.** We support the inclusion of innovative reduction technologies to generate credit under the LCFS, such as solar thermal and other renewable inputs that can reduce the carbon intensity of petroleum directly. Because petroleum-based sources represent 94% of the current market in California, it is also critical to encourage improvements across the petroleum supply chain.

Again, we thank ARB staff for their hard work on the LCFS re-adoption and ultimately to help address climate change. We look forward to working together on the successful and smooth implementation of the LCFS.

Sincerely,



Robert LaVenture
Director, District 12
United Steelworkers



Simon Mui
Director, California Vehicles and Fuels
Natural Resources Defense Council



JB Tengco
California Director
BlueGreen Alliance

November 5, 2013

Richard Corey, Executive Officer
California Air Resources Board
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1001 "I" Street
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Dear Mr. Corey,

Both our organizations, Communities for a Better Environment and Natural Resources Defense Council, thank you for your work on the Low Carbon Fuel Standard (LCFS) which is a critical component of AB32, the Global Warming Solutions Act of 2006. We write to you to help clarify areas of consensus on petroleum accounting under the Low Carbon Fuel Standard, specifically the treatment of increases or decreases in carbon-intensity.

We strongly support the LCFS including full, accurate accounting for any backsliding in gasoline and diesel carbon-intensity performance over time.

We support ARB ensuring the LCFS properly accounts and protects against increases in the carbon-intensity performance of gasoline and diesel above the 2010 baseline, due to either increased crude oil production emissions or increased petroleum refinery emissions. By the same token, we continue to oppose efforts by the oil industry to have ARB ignore these potential emission increases -- doing so would be scientifically inaccurate and inconsistent with the performance-based treatment for all other fuels.

Both organizations continue to support ARB moving to accounting for individual refinery emissions and for crude oil production emissions under the LCFS, with deficits assigned on a refinery-specific basis. Currently the LCFS accounts for only changes in crude oil production emissions and not for changes in refinery emissions. Going forward, increases in crude oil production emissions should be ascribed at the refinery-level, as opposed to averaging across the entire industry as currently implemented under the crude oil provisions. These improvements are consistent with the design principles and goals of (1) accurate lifecycle accounting, (2) ensuring the LCFS reductions and benefits are not offset, and (3) sending a more fair and direct, as opposed to diffuse, market signal to ensure refineries and crude oil producers do not worsen their carbon-intensity performance over time.

ARB can utilize existing mandatory reporting data to track any potential increases on the refinery performance side. Any deficits can be applied at the refinery or company-reporting level, as potentially a separate ledger under the LCFS, such that differentiation and tracking of finished gasoline and diesel beyond the refinery gate is not required.

We support providing LCFS credits for investments at refineries above and beyond the normal course of business that improve the carbon-intensity of petroleum-based gasoline and diesel over time.

We also support ARB accounting for the carbon emission reductions resulting from direct capital investments in innovative technologies at refineries and crude oil production facilities. Refineries and crude oil production facilities have a large potential to invest in cleaner technologies including energy efficiency, switching to renewable feedstocks and energy inputs, among many other pathways. This is analogous to the crediting of improvements by alternative fuel producers who reduce their carbon-intensity under the LCFS “Method 2” process for new fuel pathways. Reductions should be demonstrated as real, additional, permanent, and verifiable with the data submissions and enforcement provisions analogous to current requirements for alternative fuel producers. Credits should not be provided for maintenance projects (such as tightening leaky valves) undertaken as normal industry operating procedure. Crediting carbon reduction projects at refineries should be reserved only for investments that result in direct, additional, and permanent carbon reductions at those facilities.

We oppose providing LCFS credits for merely shifting to a lighter oil crude oil slate without demonstrating direct, additional and permanent carbon emission reductions.

Currently, a number of California refineries are positioning themselves to increase their supplies of Bakken tight oil (generally lighter), presumably because these are currently “price advantaged” crude oils. Such shifts are typically ephemeral, not additional or permanent. Simply crediting for these shifts – which do not reflect investments to reduce carbon emissions permanently -- could significantly undermine the LCFS requirements and should not receive credits.

We look forward to working with you to help implement these recommendations with the goal of building a stronger, more robust LCFS that adequately protects against backsliding while encouraging oil companies to innovate and invest in carbon reduction technologies. If you have any questions, please feel free to contact Greg Karras at 510-302-0430 x19 (gkarras@cbe.org) or Simon Mui at 415-875-6120 (smui@nrdc.org).

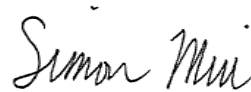
Very truly yours,

Greg Karras



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Director, California Vehicles and Fuels
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Cc: Mr. Ken Alex, Office of Governor Jerry Brown
Mr. Cliff Rechtschaffen, Office of Governor Jerry Brown
Ms. Mary Nichols, Chairman, California Air Resources Board
Ms. Edie Chang, Deputy Executive Officer
Ms. Cynthia Marvin, Chief, Stationary Sources Division
Mr. Steve Cliff, Assistant Division Chief
Mr. Michael Waugh, Transportation Fuels Branch Chief
Mr. Floyd Vergara, Alternative Fuels Branch Chief