August 8, 2022

Cheryl Laskowski, Ph.D.
Low Carbon Fuel Standard Program
California Air Resources Board
1001 I St.
Sacramento, CA 95814

Re: Electrify America comment on potential changes to Low Carbon Fuel Standard

Dear Dr. Laskowski,

Electrify America appreciates the opportunity to comment in response to the July 7, 2022, Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard. Electrify America is the nation's largest open DC fast charging network for electric vehicles, with nearly 3,400 ultra-fast chargers across 784 locations around the country, and over 1,000 chargers across 237 locations open to the public in California.

The Low Carbon Fuel Standard is a cornerstone of California's climate policy, providing a technology-neutral and market-based approach to reducing the carbon content of transportation fuels in the state. By creating an incentive for low-carbon alternatives to gasoline and diesel, the program creates a supplemental revenue stream that is crucial in supporting new low-carbon technologies and overcoming the barriers to mass-market adoption of these fuels.

However, since early 2021, it has become increasingly evident that the program targets are no longer sufficiently stringent to ensure the program maintains its intended technology-forcing effects. In 2021, the program achieved a 9.36% reduction in carbon intensity relative to the program baseline, significantly exceeding the 8.75% target.[1] As a result, the program is experiencing a credit surplus, declining credit values, and decreasing support for low carbon fuel providers to sustain and expand operations in the state. Since early last year, spot market credit values have declined by roughly half, making it more difficult for credit revenues to offset the near-term operational costs of low-carbon fuel providers.

Electrify America strongly supports the LCFS program, and respectfully encourages CARB to take appropriate steps to increase program stringency and realign the program with California's carbon reduction goals.

Recommendation 1: Increase Program Stringency with a 2030 Reduction Target of 30% or Greater

In the July 7 presentation, CARB outlined two potential scenarios for increasing program stringency by 2030, with Scenario A setting a 25% target and Scenario B setting a 30% target, relative to the existing program target of 20%. Based on analysis by The Weideman Group (see Appendix), Electrify America believes that a 30% target should be the absolute minimum for ensuring the intended technology-forcing effects of the

[1] California Air Resources Board. "LCFS Data Dashboard." Available at: https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard

program, and that even more stringent targets should be considered as potentially necessary to ensure program efficacy.

The analysis compared the proposed LCFS targets against the expected reductions from existing policy and future reductions considered in the context of CARB's 2022 Scoping Plan update, and found that Alternative 3, CARB's proposed Scoping Plan scenario, would achieve carbon intensity reductions of approximately 30% by 2030. However, all of the Scoping Plan alternative scenarios significantly underestimate zero-emission vehicle deployment relative to observed trends. The four alternative scenarios assume that approximately 900,000 ZEVs will be on the road in California at the end of 2022, while based on historical adoption and current sales rates, the California Energy Commission projects that California will have approximately 50% more ZEVs by the end of the year. Analysis of sales trends and CARB modeling scenarios suggests that this gap could widen to 65% more ZEVs on the road than assumed in the proposed Scoping Plan scenario by 2030.

As such, there is a strong possibility that ZEV adoption trends over the next several years will result in exceeding the 30% reduction by 2030, even absent increases to LCFS program stringency. In order to maintain the technology-forcing effects of the LCFS program, we respectfully encourage CARB to consider a 30% by 2030 reduction target as the minimum for program stringency, and to consider more stringent targets as potentially appropriate given observed trends in ZEV adoption.

Recommendation 2: Establish FCI Capacity Credits for MHDV Charging Infrastructure

CARB's July 7 workshop presentation considered potentially establishing FCI crediting for medium- and heavy-duty vehicle (MHDV) charging infrastructure. As Electrify America previously stated in January 2022 comments, we support continued support for both hydrogen and electric vehicles and encourage CARB to offer similar capacity credit generating opportunities for DC fast charging for MHDV applications.

MHDV charging infrastructure is subject to similar up-front investment constraints as light-duty charging, and therefore would similarly benefit from capacity crediting. Early support for the build out of heavy-duty charging infrastructure is needed until heavy-duty EV deployments reach critical mass to support fleets, just as was the case for light-duty EVs.

Additionally, as CARB considers adjustments or expansion to capacity crediting mechanism for ZEV infrastructure under the LCFS, Electrify America requests that CARB reconsider the prohibition on capacity credits for projects that include investment made under a California or federal settlement, particularly with regard to ZEV infrastructure built to serve medium and heavy-duty fleet vehicles. Maintaining this prohibition would limit the potential benefits and scope of settlement-related investments, and it would create an undue hindrance against Electrify America's ability to build ZEV infrastructure that serves public transit agency, school bus fleet, and drayage fleet operator charging needs through our $800 million investment in California.

The California Air Resources Board has explicitly and directly urged and supported Electrify America investments serving such fleets through the Green City Initiative in Long Beach and Wilmington, as well as in other parts of the state. However, prohibiting such investments from qualifying for capacity credits would limit Electrify America's ability to serve these fleets and make investments in CARB's priority communities, consistent with CARB's direction.

Electrify America respectfully encourages that CARB establish FCI crediting for MDHV charging infrastructure without restriction on use of settlement funds, to ensure that EVSPs are equally able to benefit from this important incentive for decarbonizing medium- and heavy-duty fleets in the state.

Conclusion

Electrify America appreciates the opportunity to provide comment on potential changes to the LCFS program. This program is critically important to meeting California's air quality, climate, and transportation goals, but needs to be periodically realigned with state emissions trends to ensure it is having the intended technology-forcing effect. We respectfully encourage CARB to create new credit opportunities to advance electrification goals in the medium- and heavy-duty space, but critically, to increase the stringency of the program standards sufficiently to ensure the program continues to provide adequate incentive for technologies that reduce emissions. We look forward to continuing to work with CARB in finalizing upcoming changes to the program.

Sincerely,

/s/

Matthew B. Nelson
Director of Government Affairs

Appendix: Preliminary Assessment of Carbon Intensity Targets Pursuant to 2022 Scoping Plan Update

This Appendix summarizes a preliminary analysis of carbon intensity reduction targets consistent with the 2022 Scoping Plan Update and additional targets for the Scoping Plan established by the Governor in his recent letter to CARB Chair Liane Randolph. While detailed analysis will be necessary to inform final targets, this initial analysis suggests 2030 carbon intensity targets of greater than 30%, and likely at least 35%, will be necessary to align with the outcomes and targets envisioned in the Scoping Plan.

CARB has consistently maintained its priority to align the next set of LCFS amendments, and presumably carbon intensity reduction targets, with the 2022 Scoping Plan Update. In May, CARB released the Draft 2022 Scoping Plan Update and Appendices, which include modeling results for four alternative scenarios to achieve the state's carbon neutrality goals, including the proposed Scoping Plan scenario, Alternative 3.[1] Subsequently, Governor Newsom wrote a letter to Chair Randolph asking for additional targets to be included in the final Scoping Plan,[2] which among other items, includes:

- A 20% clean fuels target for the aviation sector
- Increasing the stringency of the LCFS
- Accelerating transitions away from petroleum use in refining
- Carbon dioxide removal goals of 20 $MMTCO_2$/year in 2030 and 100 $MMTCO_2$/year in 2045

The Scoping Plan modeling results include energy use and greenhouse gas emissions by fuel used in the transportation sector; however, transportation sector emissions do not include a full lifecycle accounting. The analysis presented in this Appendix uses the following carbon intensity assumptions by fuel, which are estimated from Figure 5a and 5b of CARB's LCFS Dashboard,[3] or otherwise assumed for petroleum-based fuels.[4] Carbon intensity values are held constant over time for the purpose of this analysis, which is assumed to represent a conservative assumption, since carbon intensity values often improve for alternative fuels over

[1] Specifically, see "AB 32 GHG Inventory Sectors Modeling Data Spreadsheet" at https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

[2] https://www.gov.ca.gov/wp-content/uploads/2022/07/07.22.2022-Governors-Letter-to-CARB.pdf?emrc=1054d6

[3] https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard

[4] This analysis generally assumes petroleum-based diesel and CARBOB have a carbon intensity of 100 gCO_2/MJ. Gasoline is assumed to include 10% ethanol with an average carbon intensity of 60 gCO_2/MJ, giving it a carbon intensity of 97. Note that Alternative 3 of the Scoping Plan includes carbon capture and sequestration (CCS) in the refining sector. Rather than adjusting the carbon intensity of these fuels, emissions reductions associated with CCS in refining are added to the analysis separately.

time.[5] With these carbon intensity values and energy use by fuel from the Scoping Plan, a weighted average of carbon intensity in the transportation sector can be estimated.[6]

Assumed carbon intensities (gCO_2e/MJ)	
Biogas	-45
Conventional Diesel	100
Conventional Gasoline / Conventional Ethanol	97
Conventional Jet Fuel	100
Electricity	-10
Hydrogen	25
Natural Gas	85
Renewable Diesel	37
Renewable Jet Fuel	38

The preliminary analysis in this Appendix considers four scenarios. The first is a straightforward analysis of Alternative 3 of the Scoping Plan, based on energy demand by fuel, the carbon intensities identified above, and including emissions reductions included in Alternative 3 from carbon capture and sequestration in the refining sector. This scenario achieves a 30% carbon intensity reduction in 2030, 41% in 2035 and 77% in 2045.

While any of the assumptions in the Scoping Plan scenario could be argued, note especially that Alternative 3 seems to underestimate light-duty zero emission vehicle (ZEV) sales through 2030. All alternatives in the Scoping Plan underestimate current and near-term ZEVs on the road. For example, the four alternatives include 900,309 ZEVs on the road in California in 2022, whereas according to the California Energy Commission, through the second quarter of 2022, there were already 1,214,516 ZEVs on the road (35% more than the Scoping Plan) and at current rates, there will be 1,374,937 (53% more than the Scoping Plan) by the end of the year.[7]

In the Advanced Clean Cars II ISOR, CARB provides data that allows an estimate of likely ZEV sales, including automaker estimates of ZEV sales through 2025 and a modeled transition of automakers converting their vehicle models to ZEVs through 2030.[8] (As a point of comparison, the automaker estimate for ZEV sales in 2022 is 13%, and thus far in 2022, ZEV sales in California account for more than 16% of new cars.) CARB's modeling includes both "ASAP" and "slow turnover" scenarios, reflecting when automakers may turn vehicle models over to ZEV models. Using the slow turnover scenario as a conservative assumption to estimate ZEV sales

[5] CARB's amendments to the LCFS may affect this assumption, at least for certain fuels, and subsequent analysis should consider the wider range of potential proposals and their impact on expected carbon intensity and credit generation.

[6] For estimating carbon intensity reductions, this analysis assumes a 2011 baseline of 100.

[7] https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales

[8] The Advanced Clean Cars II Initial Statement of Reasons provides survey results for expected automaker ZEV sales in 2022-2025 (Figure 4, pg. 39) and analysis of model turnover scenarios (Figure 6, pg. 41). https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/isor.pdf

through 2030, these datapoints suggest we'll likely have about 8 million ZEVs on the road in California by 2030, or 3.2 million more (65% more) than assumed in proposed Scoping Plan scenario (Alternative 3).

	ZEV sales to date[1]	CARB ACC II ISOR (OEM plans+model)[2]	Total new car sales[3]	Likely ZEV sales[4]	Scoping Plan Alt. 3[5]	Scoping Plan Alt. 2[5]
2015	64,134			64,134	42,776	42,776
2016	72,683			72,683	46,257	46,257
2017	93,587			93,587	102,658	102,658
2018	157,143			157,143	99,095	99,095
2019	147,347			147,347	123,420	123,420
2020	145,099			145,099	99,869	99,869
2021	250,279			250,279	139,904	139,904
2022[6]	320,842	13.0%		320,842	192,017	192,017
2023		21.0%	1,886,783	396,224	238,697	354,313
2024		29.5%	1,895,699	559,231	281,583	510,653
2025		31.0%	1,904,615	590,431	325,474	671,324
2026		35.0%	1,911,785	669,125	413,814	839,631
2027		41.0%	1,921,865	787,965	497,952	1,014,861
2028		52.0%	1,931,661	1,004,464	587,121	1,193,187
2029		65.0%	1,941,144	1,261,744	748,633	1,369,228
2030		78.0%	1,950,372	1,521,290	921,258	1,534,284
Total				**8,041,587**	**4,860,528**	**8,333,478**

[1] https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales

[2] The Advanced Clean Cars II Initial Statement of Reasons provides survey results for expected automaker ZEV sales in 2022-2025 (Figure 4, pg. 39) and analysis of model turnover scenarios (Figure 6, pg. 41).The percentages here are estimated from those figures and represent automaker survey results for 2022-2025 and results for the "Slow Phase" model turnover scenario for 2026-2030. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/isor.pdf

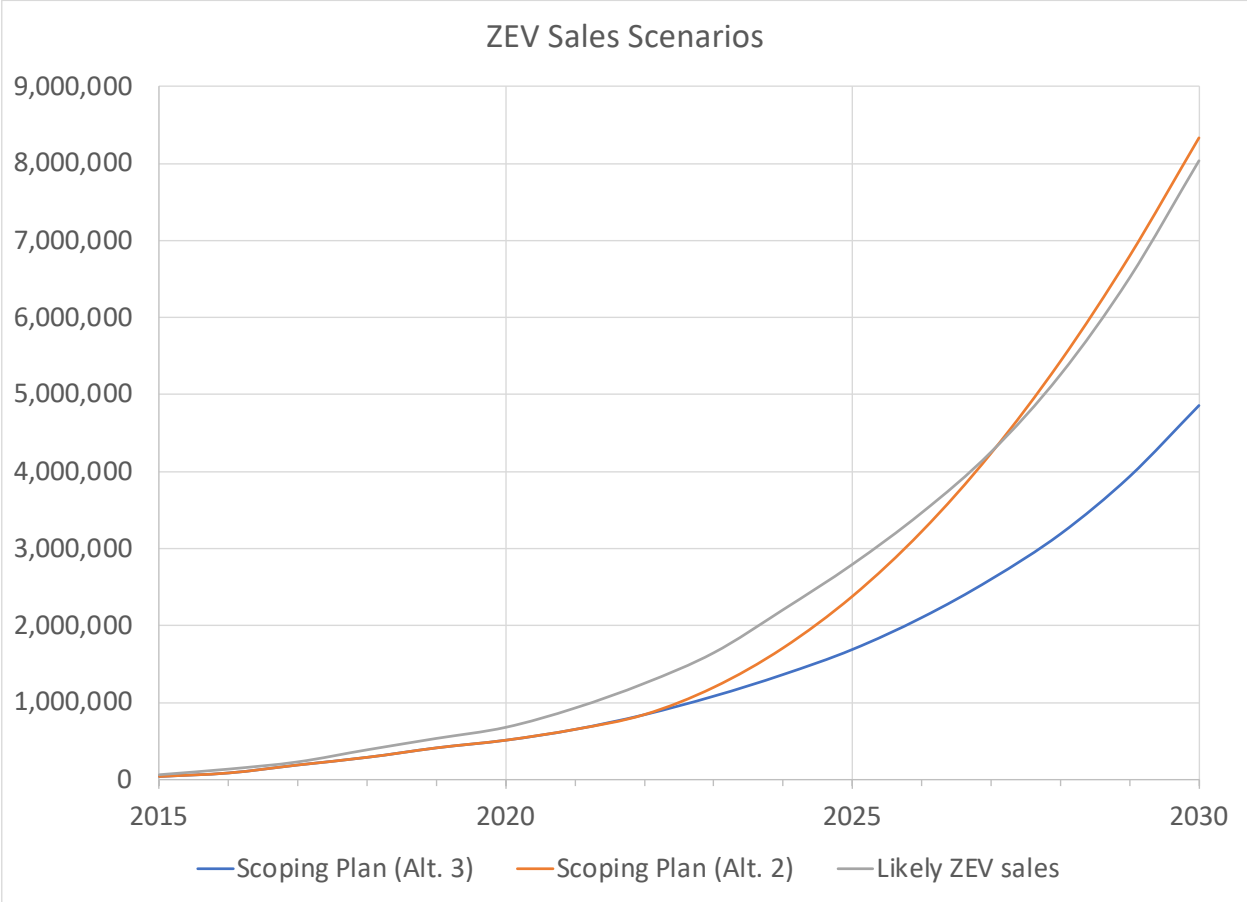
[3] The Advanced Clean Cars II Standardized Regulatory Impact Assessment Table 66 (pg. SRIA-132) provides total new cars sales for years 2026-. Sales for 2023-2025 are extrapolated from those numbers. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/appc1.pdf

[4] Likely ZEV sales here defined as historic sales for 2015-2022 (estimated for the year) and the product of CARB ISOR column and total new car sales for years 2023-2030.

[5] Includes sum of BEV, hydrogen fuel cell and PHEV40 sales 'LDV Sales' worksheet in "AB 32 GHG Inventory Sectors Modeling Data Spreadsheet" at https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

[6] CEC forecast for 2022, based on current sales rates through Q1-Q2 (see reference in 1)

These likely ZEV sales track fairly closely to ZEV sales in the more ambitious Alternative 2 of the Scoping Plan (see figure below). If anything, due to the fact that Alternative 2 underestimates historic, current, and likely near-term ZEV sales, total LCFS credits generated from likely ZEV sales cumulatively through 2030 would be greater than those generated from ZEVs in Alternative 2. Therefore, while Alternative 2 has some additional assumptions that differ from Alternative 3 that would affect electricity and gasoline fuel use compared to this likely ZEV scenario (such as slightly lower vehicle miles travelled), it nonetheless represents a close match for electricity and gasoline energy use through 2030 under a likely ZEV sales scenario based on data and modeling from the ACC II ISOR.



Accordingly, to estimate LCFS carbon intensity reduction targets that better reflect likely ZEV sales in California, a second scenario is developed that substitutes gasoline and electricity transportation fuel demands from Alternative 2 for those in Alternative 3. It also includes the Governor's goal of achieving 20% sustainable aviation fuel (here modeled as a goal reached in 2030.[9]) In that scenario, which would seem to reflect a reasonable baseline that incorporates Scoping Plan targets and likely ZEV sales, carbon intensity reductions are 35% in 2030, 50% in 2035 and over 90% in 2045.

Finally, depending on what role CARB envisions for the LCFS to achieve the Governor's carbon dioxide removal targets, even more stringent carbon intensity reduction targets may be appropriate. Given that CARB has found that natural and working lands on net will likely remain a net source of emissions through 2045,[10] and the LCFS is currently the only policy mechanism supporting direct air capture of carbon dioxide or carbon sequestration, the LCFS quite possibly will be the primary driver of carbon dioxide removal for the foreseeable future.

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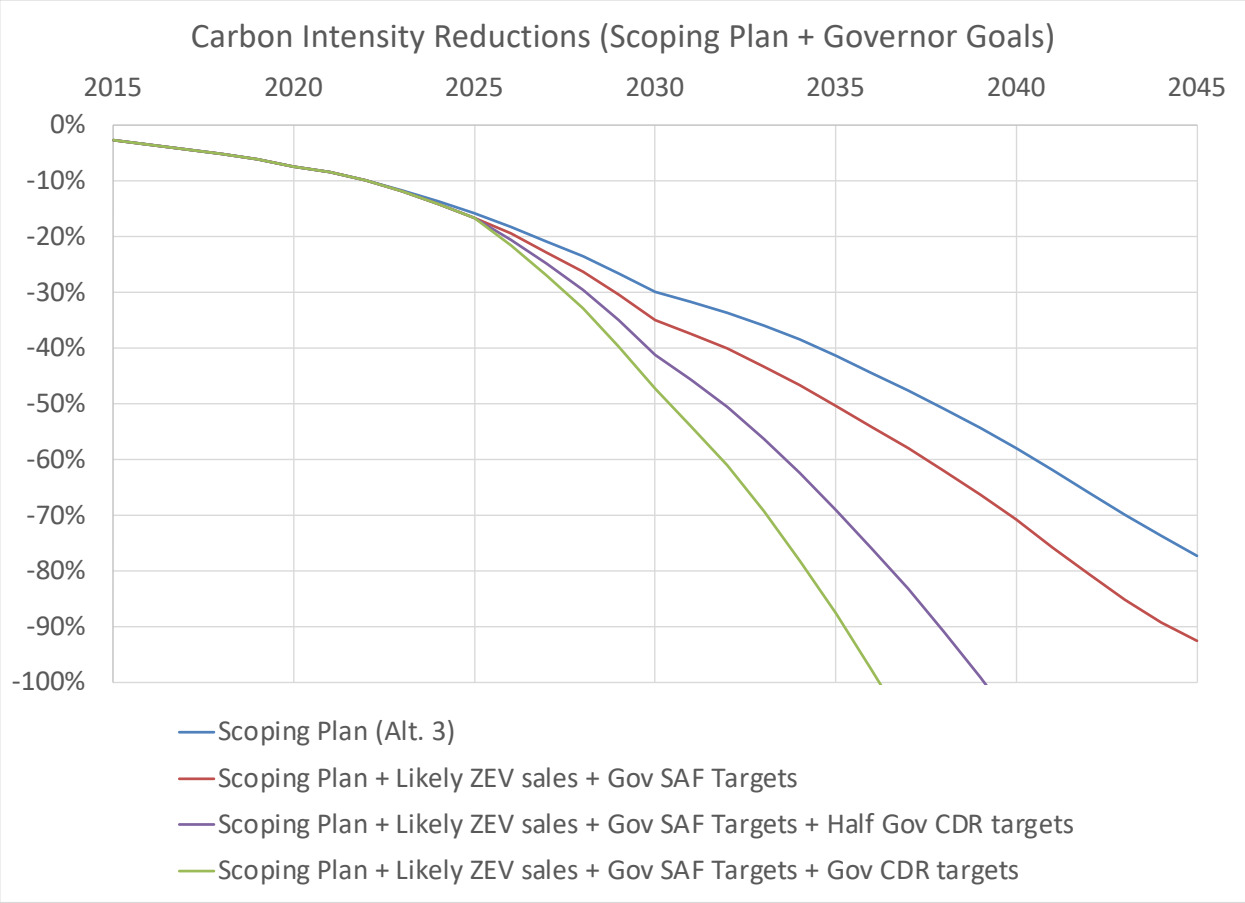
[9] For context, a bill pending in the legislature (AB 1322, Rivas) and supported by the airline industry, would have originally required greater use of sustainable aviation fuels than 20% by 2030, making this assumption feel reasonable and likely conservative. (The bill has subsequently been amended to remove such a target, however.)

[10] For example, see page 70 of draft 2022 Scoping Plan Update: https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf

Therefore, two final carbon intensity scenarios are included that adds in the Governor's carbon dioxide removal targets.[11] One assumes the LCFS achieves all of the targeted levels of carbon dioxide removal, which leads to carbon intensity reductions of 47% in 2030 and greater than 100% by 2037. If the LCFS is expected to support half of the carbon dioxide removals, carbon intensity reductions are 41% in 2030 and greater than 100% in 2040.

These scenarios are summarized in the figure below.



While preliminary, this analysis provides a generally conservative estimate of transportation fuels carbon intensity under the Scoping Plan, including new targets established by the Governor and reasonably expected ZEV sales. Based on this initial analysis, it would seem that CARB should consider carbon intensity reduction targets of greater than 30%, and likely at least 35%, by 2030. If the LCFS is to play a meaningful role in supporting the Governor's carbon dioxide removal goals, CARB may want to consider even more stringent targets.

[11] It also assumes that carbon dioxide removal levels increase linearly from 0 $MMTCO_2$ in 2025 to 20 $MMTCO_2$ in 2030, then from 20 $MMTCO_2$ in 2030 to 100 $MMTCO_2$ in 2045.