December 21, 2022

Cheryl Laskowski, Ph.D.
California Air Resources Board (CARB)
1001 I Street
Sacramento, California 95814

RE: Electrify America comments on LCFS target modeling

Dear Dr. Laskowski:

Electrify America appreciates the opportunity to comment on the November 9 Public Workshop: Concepts and Tools for Compliance Target Modeling under the Low Carbon Fuel Standard (LCFS). 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.

In response to the July LCFS workshop, Electrify America submitted comments that included an initial analysis of targets in-line with the Draft 2022 Scoping Plan Update (Draft Scoping Plan) and letter from the Governor to CARB Chair Liane Randolph, regarding additional targets to include in the Final Scoping Plan.[1] That analysis found that the Draft Scoping Plan scenario, coupled with the Governor's requested targets and adjusted zero emission vehicle (ZEV) sales to better reflect existing and likely near-term ZEV sales, would lead to a 35% reduction in carbon intensity by 2030 and a 92% reduction in 2045. We appreciate that CARB updated its initial proposed targets from the July workshop and added a scenario (Alternative C) that closely reflects these findings and outcomes. However, by our estimation, that scenario is conservative, and it should be considered a floor in deliberations about future target setting, rather than a ceiling. We expect modeled LCFS targets that align with the State's carbon neutrality goal and Final 2022 Scoping Plan Update (Final Scoping Plan) could be on the order of 40-50% in 2030 and well over 100% in 2045.

In addition to this primary point, we offer several additional comments on target setting, the California Transportation Supply (CATS) modeling, and other concepts discussed at the workshop. These are summarized here and expanded upon below:

- CARB should align modeling assumptions and final LCFS targets with the Final Scoping Plan.

[1] https://www.arb.ca.gov/lists/com-attach/126-lcfs-wkshp-jul22-ws-UmAANldkAGEHLAk5.pdf

- The LCFS already includes a cost containment mechanism, which provides support for adopting strong targets in line with the Final Scoping Plan.
    - The program does not have a similar provision in the other direction, however, should prices fall or credits be over-supplied. We support consideration in a future workshop of a ratcheting mechanism, but note that it should be *additional* to strong baseline targets, rather than justifying adoption of lower targets that don't fully align with state goals.
- CARB should not make changes to existing pathways without a very clear justification basis that is foreseeable through an established process.
- Any changes to pathways should prioritize greenhouse gas reductions and support equitable treatment between biomethane-to-electricity and other biomethane-based pathways.
    - CARB should continue to account for avoided methane emissions associated with biomethane projects and update avoided methane accounting for other biomethane pathways – such as landfills, wastewater treatment plants, and anaerobic digestion from landfill-diverted organic waste – to better align carbon intensities for other biogas pathways with dairy pathways.
    - Provide equal treatment for biomethane-to-electricity with other biomethane pathways.
- CARB should expand capacity crediting for hydrogen refueling and DC fast charging for medium- and heavy-duty vehicles (MHDV), capped at 10% of deficits.
    - CARB should not restrict the use of settlement funds for projects generating capacity credits, particularly with regard to ZEV infrastructure built to serve MHDV fleets.
- The CATS model includes several assumptions that consistently appear to be overly conservative and push in the direction of lower targets. The model and assumptions should be updated to:
    - Align fuel pool demands and other assumptions, including refining emissions, with levels in the Final Scoping Plan.
    - Update ZEV sales and electricity demand assumptions based on current data and expected near-term sales.
    - Include all categories of low carbon fuel pathways in the model, including additional biogas and biogas-to-electricity pathways and carbon capture and sequestration (CCS) applied to all relevant pathways.
    - Include all relevant federal and state subsidies, including for biogas, hydrogen and biogas-to-electricity pathways.
    - Assume CCS projects use geologic sequestration, rather than enhanced oil recovery – which is no longer allowed in California – and capture federal incentives accordingly.

Alternative C should represent a starting point in CARB's evaluation of strengthened carbon intensity reductions, and CARB should evaluate additional scenarios that align with the Final Scoping Plan and achieve greater climate benefits

As referenced above, we appreciate CARB introducing Alternative C, whose targets align with an analysis presented in our comments following the July LCFS workshop. We note, however, that the similar scenario presented in our comment letter was designed to be conservative and did not include several elements which are now embedded in the Final Scoping Plan. We believe a thorough analysis of carbon intensity targets in line with the Final Scoping Plan would suggest greater targets than identified in Alternative C, and we encourage CARB to continue to evaluate program stringency and propose targets that align with current market realities and the array of goals and activities included in the Final Scoping Plan.

For example, the scenario presented in our earlier comment letter than found 35% carbon intensity in 2030 and 92% in 2045 does not include the Governor's carbon dioxide removal targets (20 $MMTCO_2$/year by 2030 and 100 $MMTCO_2$/year by 2045), which as reflected in the Final Scoping Plan,[2] are likely to come predominately from biomass-related hydrogen pathways and direct air capture, both of which are likely to generate credits under the LCFS. Achieving the Governor's carbon dioxide removal targets would therefore inject a significant quantity of additional credits into the LCFS market, with important implications for other fuel pathways that should be recognized an accounted for. For example, in the analysis included in our comment letter, if half of the Governor's carbon removal goal generate LCFS credits, carbon intensity reductions would be 41% in 2030 and about 150% in 2045. If all of the State's targeted carbon removal levels generated LCFS credits, carbon intensity reductions would be 47% in 2030 and over 200% in 2045.

The analysis by Weideman Group presented in our comment letter was conservative for other reasons, as well. For one, it did not consider the proposed expansion of capacity credits for heavy-duty ZEV charging and refueling. It also assumed carbon intensities stay constant at current levels, without continued improvement over time. However, by its nature, and as demonstrated in the program thus far, the LCFS drives continual carbon intensity reductions across all fuel pathways.

Also, recent incentives under the Inflation Reduction Act (IRA) could lead to significant carbon intensity improvements and cost reductions for a wide array of pathways, including hydrogen, biogas, biofuels, and through the deployment of CCS. For example, as highlighted in CATS Model Technical Documentation provided as part of the workshop materials, the cost of CCS added to an ethanol facility is \$50/$MTCO_2$, and new incentives under the IRA will provide \$60-85/$MTCO_2$.[3] It reasons that the average ethanol facility would eventually add CCS to their operations, once they are able to. The same holds for a number of other fuel pathways

[2] 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
[3] https://ww2.arb.ca.gov/sites/default/files/2022-11/CATS%20Technical.pdf

expected to have relatively low costs for CCS, including hydrogen production, gasification, some biogas pathways, and potentially others.[4,5] Suffice to say, cost-effective CCS deployed at scale across a wide array of transportation fuel pathways would have profound effects on the LCFS market.

Accordingly, we believe the stringencies included in Alternative C should represent a starting point and least aggressive scenario in CARB's ongoing analysis. We encourage CARB to continue evaluating appropriate LCFS stringency in-line with the Final Scoping Plan and expected market trends and impacts of the IRA, including scenarios that would achieve greater than 35% carbon intensity reductions in 2030 and 90% carbon intensity reductions in 2045. As noted below, the Final Scoping Plan significantly underestimates current, and likely near-term future ZEV sales, and therefore, credits from transportation electrification pathways, especially through 2030. The CATS model underestimates them even further. Without dramatic change in state and federal policy, the LCFS will be a driver of carbon removal and net-negative emissions, which may require carbon intensity reductions under the LCFS of greater than 100% to achieve the State's carbon neutrality target.

Designing targets for uncertainty: Cost containment + ratcheting mechanism

The LCFS already has a cost containment mechanism built in, which should give CARB comfort in setting the strongest possible targets to reduce greenhouse gas emissions and drive innovation most quickly and deeply in the low carbon transportation fuels sector. Should costs remain a concern as CARB considers new targets, the appropriate response is to consider modifications to the cost containment mechanism, rather than weaker targets. Costs will always be uncertain, regardless of the targets set.

While the program already includes an effective cost containment mechanism to accommodate uncertainty in one direction under the program (i.e., a tight credit market), it does not include a similar mechanism in the other direction, should there be a glut of credits in the program. Therefore, we support further evaluation in future workshops of a potential ratcheting mechanism, as has been suggested by stakeholders, and especially in light of the large, yet unpredictable, potential influx of new credits and credit generation sources, as noted above. However, any consideration of such a mechanism should only be *in addition* to minimum targets that align with the Final Scoping Plan, which are likely no less than those identified in Alternative C, and should only go in the direction of increased program stringency – given the presence of a cost-containment mechanism already in place. That is, a potential ratcheting mechanism should be designed to capture additional greenhouse gas reduction opportunity and account for unexpected innovation, rather than provide an excuse for lower targets that do not align with the State's existing goals.

[4] For example, see https://www.iea.org/commentaries/is-carbon-capture-too-expensive

[5] Jun Wong, Jonathan Santoso, Marjorie Went, and Daniel Sanchez (2022) Market Potential for CO2 Removal and Sequestration from Renewable Natural Gas Production in California, *Environmental Science & Technology 56*(7), 4305-4316. DOI: 10.1021/acs.est.1c02894

Together, and in conjunction with new targets that align with the State's carbon neutrality and other greenhouse gas goals, cost containment and a ratcheting mechanism will best position the market for certainty and the state for achieving its climate change objectives.

Comments on the LCFS modeling and scenario assumptions

Here we provide several comments on the scenario assumptions and methods included in the LCFS modeling. We appreciate CARB posting the CATS model documentation and summary inputs for review, and would appreciate the opportunity to review additional information, including modeling outputs, to gain further understanding about the assumptions, methods, and their impacts on the analysis. In general, we find that there are several assumptions that appear out of line with the Final Scoping Plan and serve to limit estimated carbon intensity reductions and increase prices associated with them.

Scenarios should all align with Final Scoping Plan at a minimum

As a starting point, updated LCFS targets should be designed to align with the Final Scoping Plan. CARB has deliberately delayed amending the LCFS until the Final Scoping Plan is approved, and has stated its intention to align the LCFS with the Final Scoping Plan and other state and federal policies, while maintaining a strong market signal to attract private sector investment and decarbonize transportation in California.[6] However, the Final Scoping Plan is not clearly a baseline assumption imbedded in any of the alternative scenarios presented at the workshop.

Among a set of alternatives designed to achieve the objectives of the Final Scoping Plan, different scenarios could explore a number of remaining variables, including uncertainties in the market and based on new policies, as outlined above, impacts of variable oil and other energy prices, and the full opportunity space related to achieving the State's statutory carbon neutrality goal: "Achieve net zero greenhouse gas emissions *as soon as possible*, but no later than 2045, and to *achieve and maintain net negative greenhouse gas* emissions thereafter."[7] [emphasis added]

Targets should prioritize the greatest greenhouse gas reductions and fully enable biomethane-to-electricity pathways

The modeling alternatives presented a number of new potential limitations on various pathways that could serve to limit the production and use of alternative fuels, as well as associated greenhouse gas reductions. We urge CARB to prioritize greenhouse gas reductions in this rule, given the urgency of climate change and the powerful role the LCFS plays in driving

[6] See, for example, discussion around slides 10-13 from the December 7, 2021 LCFS Public Workshop: Potential Future Changes to the LCFS Program. https://ww2.arb.ca.gov/sites/default/files/2021-12/LCFS%2012_7%20Workshop%20Presentation_notes.pdf

[7] Assembly Bill 1279 (Muratsuchi, Chapter 337, Statutes of 2022) https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1279

climate outcomes and innovation in transportation fuel supply chains around the world, and to avoid unnecessary limitations on crediting pathways, especially those projects that rely on the LCFS market signal to occur.

As a broad principle, changes that serve to cut out allowable sources of low carbon fuels from the program without a very clear justification basis that is foreseeable through an established process will serve to reduce investment in low carbon fuel pathways and make project development more risky and costly. We discourage CARB from eliminating currently eligible pathways until it has clear set of rules to do so.

In particular, regarding biomethane accounting and eligibility, we urge CARB further enable biomethane-to-electricity pathways and ensure at least equal treatment between biomethane-to-electricity pathways and biomethane used in hydrogen applications.

Generating electricity from biomethane sources reduces methane emissions and is therefore the least greenhouse gas emissions-intensive source of electricity for electric vehicle charging. CARB can advance its greenhouse gas emissions reduction goals by continuing the practice of avoided methane crediting for facilities that produce electricity from biomethane, which recognizes and accounts for the climate change benefits produced by using biomethane to produce electricity as a transportation fuel. If CARB were to proceed with phasing out eligibility from existing biomethane-to-electricity pathways and ceasing the certification of new biomethane-to-electricity fuel pathways with avoided methane crediting, as proposed, this would send a clear market signal discouraging investment in biomethane-to-electricity facilities.

CARB has also proposed to phase out avoided methane crediting for both renewable natural gas (RNG) and electricity in order to encourage the "long-term deployment/use of biomethane for hydrogen."[8] Electrify America strongly encourages CARB to reconsider whether to apply this phase out equally across RNG and electricity. As the U.S. EPA noted in a recently proposed regulation, electricity is "an even lower GHG-emitting means of using available biogas resources for transportation" than RNG, because "converting the biogas to electricity at the same location where the biogas is produced tends to be the lowest GHG and lowest cost means of using it for transportation since it avoids the additional expense and energy consumption associated with cleaning up the gas, transporting it in a pipeline, and compressing/liquifying it prior to fueling a vehicle."[9]

Applying this phase out to biomethane-to-electricity pathways is also unlikely to result in the intended effect on hydrogen, as the sources of biomethane used for electricity production are not likely to be available for hydrogen facilities, which typically depend on pipeline access for RNG delivery or hydrogen export, or both. As the U.S. EPA observed in its recently proposed fuels regulation, numerous factors prevent potential biomethane production facilities from producing RNG, while these same facilities are able to produce electricity from biomethane that

[8] Slide 30 of workshop slides: https://ww2.arb.ca.gov/sites/default/files/2022-11/LCFSPresentation.pdf
[9] https://www.epa.gov/system/files/documents/2022-12/rfs-set-rule-nprm-2022-11-30.pdf

otherwise would be emitted. EPA explained: "the costs of biogas cleanup to the quality needed for injection into common carrier pipelines and use in CNG/LNG vehicles can be prohibitive, and many existing landfills and digesters are located a significant distance from the natural gas commercial pipeline system and cannot cost effectively connect. Enabling biogas to be used to generate renewable electricity … would open up not only a lower cost option for many biogas production facilities, but also enable an even lower GHG-emitting means of using available biogas resources for transportation."[10]

The environmental benefits of biomethane-to-electricity pathways are substantial, and the biomethane used in electricity production is unlikely to be available for hydrogen and other priority uses. We therefore strongly encourage CARB to continue certifying fuel pathways with avoided methane accounting for biomethane-to-electricity facilities in its final regulations.

Continue supporting ZEV deployment through infrastructure crediting and a 10% cap and infrastructure credits as a percentage of deficits

As we have previously commented,[11] Electrify America supports CARB incorporating similar capacity credit generating opportunities for MHDV that currently exists for hydrogen refueling and DC fast charging for light-duty vehicles. 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 MHDV charging infrastructure is needed until heavy-duty electric vehicle deployments reach critical mass to support fleets, just as was the case for light-duty electric vehicles.

Importantly, as CARB considers adjustments or expansion to capacity crediting mechanism for ZEV infrastructure under the LCFS, Electrify America requests that CARB avoid prohibiting capacity credits for projects that include investment made under a California or federal settlement, particularly with regard to ZEV infrastructure built to serve MHDV fleets. 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 fast charging infrastructure crediting for MDHV charging infrastructure without restriction on use of settlement funds, to ensure that

[10] https://www.epa.gov/system/files/documents/2022-12/rfs-set-rule-nprm-2022-11-30.pdf
[11] https://www.arb.ca.gov/lists/com-attach/126-lcfs-wkshp-jul22-ws-UmAANldkAGEHLAk5.pdf

electric vehicle service providers are equally able to benefit from this important incentive for decarbonizing MHDV fleets in the State.

Fuel demand scenarios in CATS model should align with Final Scoping Plan

The CATS model documentation describes a wide array of differing assumptions and methods for estimating the fuel demand pool that consistently serve to over-estimate fossil fuel demand and under-estimate ZEVs, compared to the Final Scoping Plan. This fundamentally misaligns the LCFS modeling with State goals and underestimates baseline emissions reductions from existing policies. For example, while the CATS model aligns CNG demand with the Scoping Plan scenario,[12] it uses different methods to estimate gasoline fuel demand.

The set of figures below compares fuel demand for the fuel pools defined in CATS to those from the Final Scoping Plan, including both renewable and fossil fuels.[13,14,15] Of particular note, the assumptions in CATS significantly overestimate gasoline compared to the Final Scoping Plan, while significantly underestimating ZEV fuel use (electricity and hydrogen). Cumulatively, the assumptions overestimate gasoline use by 33% from 2022-2045, compared to the Final Scoping Plan, and underestimate cumulative ZEV fuel use by 20%. The difference in gasoline demand is even more pronounced in 2030-2045, as the CATS model puts gasoline use compared to the Final Scoping Plan 42% higher in 2030, 71% higher in 2035, and over 100% higher in 2040-2045.

As described below and in our previous comments, the Final Scoping Plan and CATS also underestimate current and expected near-term ZEV sales, and as a result, CATS may underestimate cumulative electricity use by about 30% compared to what we expect may be a more likely near-term ZEV sales trajectory, based on analysis in CARB's Advanced Clean Cars II rulemaking. The discrepancy in electricity assumptions is especially pronounced in the near-term, with likely ZEV electricity demand about twice as high cumulatively from 2022-2030 in the Likely ZEV case, than as represented in CATS.

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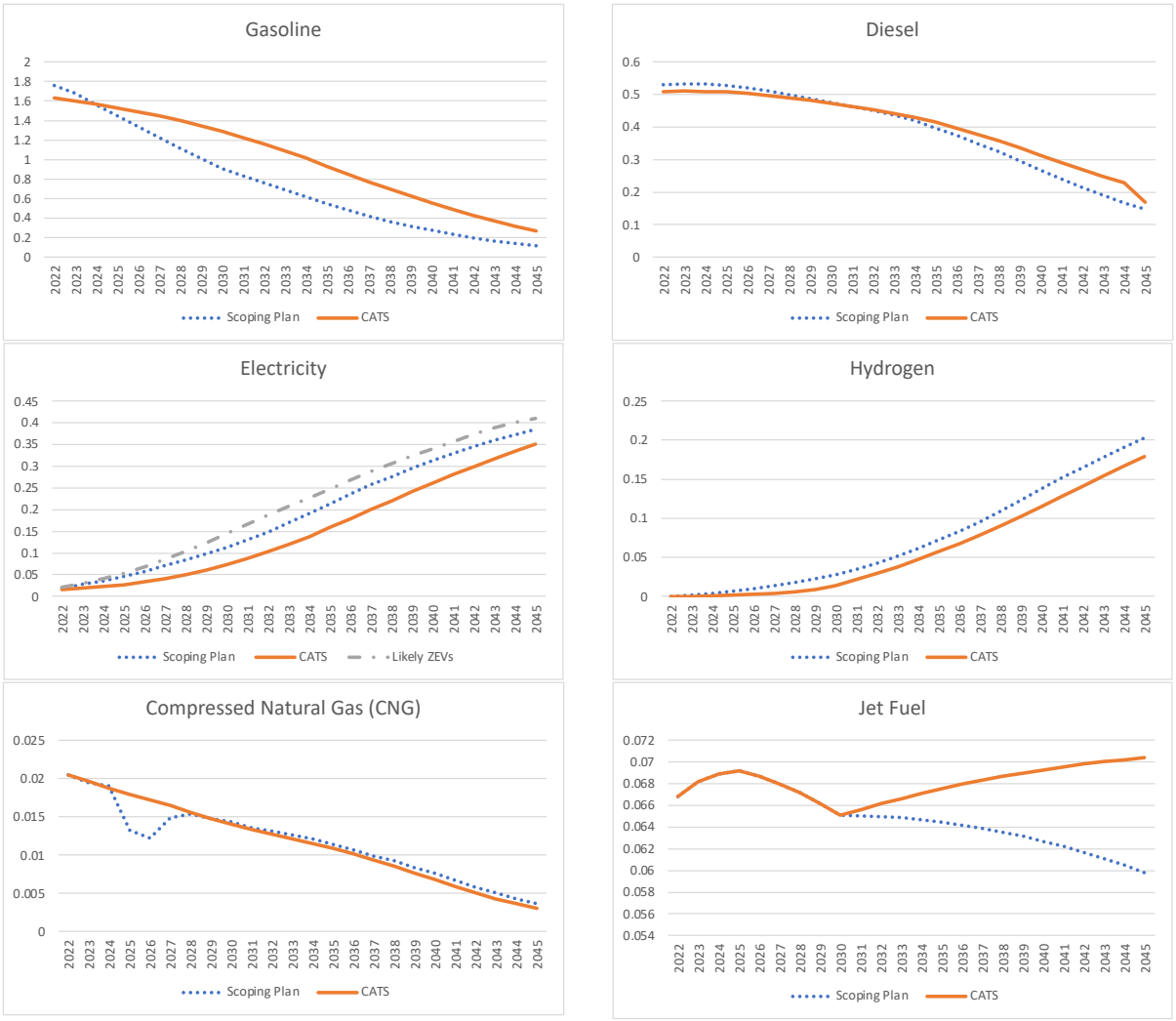
[12] Note there appears to be a discrepancy in the Final Scoping Plan modeling results for CNG in the years ~2024-2028.

[13] Energy demand for transportation fuel pools in the Final Scoping Plan can be found in the 'Energy Demand' worksheet of the "AB 32 GHG Inventory Sectors Modeling Data Spreadsheet" found at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

[14] Energy demand for transportation fuel pools in CATS can be found in the 'Energy Demand' worksheet of the "CATS Summary Inputs" spreadsheet provided with the workshop materials and found at: https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-meetings-and-workshops

[15] The fuel pools represented in the figures include the following:
Gasoline: Conventional Gasoline/Conventional Ethanol (Scoping Plan), Gasoline (CATS)
Diesel: Conventional Diesel + Renewable Diesel (Scoping Plan), Diesel (CATS)
Electricity: Electricity (Scoping Plan), LDV-e + HDV-e (CATS)
Hydrogen: Hydrogen (Scoping Plan), LDV-H2 + HDV-H2 (CATS)
CNG: Natural gas + Biogas (Scoping Plan), CNG (CATS)
Jet Fuel: Conventional Jet Fuel + Renewable Jet Fuel (Scoping Plan), Jet Fuel (CATS)

Comparison of fuel pool demands in CATS and Final Scoping Plan (EJ)



These assumptions alone put the LCFS scenario analysis well out of alignment with the Final Scoping Plan, and serve to significantly underestimate the role the LCFS should play in achieving the State's climate objectives, including its potential role as a backstop measure to achieve expected greenhouse gas reductions should other measures, such as reductions in vehicle miles travelled, not materialize at expected levels.

CATS and Final Scoping Plan continue to underestimate current and near-term ZEVs. LCFS scenario modeling should reflect current ZEVs on the road and best estimates of future ZEV sales

As described in our previous comment letter,[16] the Draft Scoping Plan scenario significantly underestimates current ZEVs on the road, and likely underestimates near-term ZEV sales, through at least 2030, as well. The Draft Scoping Plan scenario, for example, assumed ZEV sales

[16] https://www.arb.ca.gov/lists/com-attach/126-lcfs-wkshp-jul22-ws-UmAANldkAGEHLAk5.pdf

of 192,017 in 2022 and cumulative sales of 900,309 light-duty ZEVs in California in 2022, with cumulative sales in the State through 2030 reaching 4.84 million. Meanwhile, the CEC estimates 2022 ZEV sales will reach 359,121 and 1.41 million cumulatively by the end of this year.[17] Additionally, the Advanced Clean Cars II ISOR represented expected ZEV sales through 2025, based on automaker estimates, and a modeled transition of automakers converting their vehicle models to ZEVs through 2030.[18] Using the "slow turnover" scenario to be conservative, the analysis in our previous comments estimates "likely" ZEV sales to be about 8 million through 2030, which also aligns with the California Energy Commission's estimate of cumulative ZEVs in 2030 to achieve 100% ZEV sales by 2035 (which cites previous CARB analysis).[19]

Accordingly, we suggested in our previous comments, and reassert here, that Alternative 2 of the Draft Scoping Plan is a more appropriate estimate of ZEV sales through 2030 than the Draft Scoping Plan scenario. Alternative 2 includes accelerated ZEV sales assumptions compared to the Draft Scoping Plan scenario, and envisions 354,313 ZEV sales in 2023, about equal to actual expected 2022 sales, and 8.3 million cumulative ZEVs in 2030 – just slightly above our estimates using the more conservative "slow turnover" scenario from the Advanced Clean Cars II ISOR. Note that even Alternative 2 in the Draft Scoping Plan, which is reflected in the "Likely ZEVs" line in the graph for electricity demand above, significantly underestimates current ZEVs, with the same assumption of 900,309 currently on the road.

The Final Scoping Plan scenario updated ZEV sales figures compared to the Draft Scoping Plan scenario, such that 5.9 million ZEVs are on the road in 2030. However, it *lowered* current ZEV stocks to 743,930 in 2022. This means *there are nearly twice as many ZEVs on the road currently* than is assumed in the Final Scoping Plan, which as described above already far outpaces transportation electricity demand in CATS. We strongly encourage CARB to update its transportation electricity demand assumptions in the CATS model, both to reflect current ZEVs on the road and the best available estimates of expected sales through 2030.

CATS excludes several fuel pathways that will likely generate credits and deliver additional emissions reductions under the LCFS

While we recognize it may be impractical to model all fuel pathways, the CATS model excludes a number of key fuel pathways likely to generate transportation fuels and LCFS credits for the market. In particular, the model only represents two sources of biogas, and does not include a number of additional gaseous, liquid, or other electricity-based pathways. Additional pathways should be included in the model so as to avoid underestimating the likely or potential supply of low carbon transportation fuels under the program. If nothing else, CARB should acknowledge

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

[18] 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

[19] https://www.energy.ca.gov/programs-and-topics/programs/electric-vehicle-charging-infrastructure-assessment-ab-2127

the model underestimates the sources and potential supply of low carbon fuels for California, and appreciate that that assumption serves to bias the results towards more conservative outcomes.

Cost modeling should include appropriate federal and other incentives, including through the Inflation Reduction Act and e-RINs, for all fuel pathways

The CATS modeling documentation includes exogenous subsidies from the IRA and federal Renewable Fuel Standard for some, but not all, pathways. For example, the documentation describes exogenous incentives included for renewable diesel, ethanol, CCS (but only applied to ethanol), electricity, sustainable aviation fuel, and direct air capture. However, the IRA included notable incentives for biogas and hydrogen, as well, which should be accounted for in the modeling, and the incentives for CCS can apply to any fuel pathway (not just ethanol), including hydrogen, biomethane, or refining. We urge CARB to ensure the cost accounting includes all relevant incentives at the State and federal level for all fuel pathways.

We also note that the model assumes captured carbon will be used for enhanced oil recovery and capture a lower federal incentive than if it were sequestered geologically. California just banned the practice of enhanced oil recovery in the State in two separate pieces of legislation, SB 905 (Caballero, Chapter 359, Statutes of 2022) and SB 1314 (Limón, Chapter 336, Statutes of 2022),[20,21] so we believe it is more appropriate to apply the higher incentive values that assumes geologic storage of carbon. For CCS, this would be a subsidy of \$85/$MTCO_2$, rather than \$60/$MTCO_2$, and for direct air capture, \$180/$MTCO_2$, rather than \$130/$MTCO_2$.

Conclusion

The LCFS is one of the State's most powerful tools for supporting clean transportation in California, including electric vehicles and charging infrastructure, and we encourage CARB maximize its effectiveness by adopting strong targets in line with the State's stated climate change goals and objectives. We hope CARB will update modeling assumptions to align with the Final Scoping Plan, reflect all likely fuel pathways and market realities, and fully account for newly available incentives under federal policies that will serve to drive significant cost reductions across a number of low carbon fuel pathways. Ultimately, we hope CARB will explore a wider array of scenarios aimed to deliver the most significant greenhouse gas reductions practical, and no less than envisioned by the Final Scoping Plan. We expect such an analysis would suggest targets greater than those reflected in Alternative C to be most appropriate.

Thank you again for the opportunity to comment on this workshop, and for the materials shared to help stakeholders understand the CATS and Scoping Plan modeling. We look forward to continuing to work with CARB through the LCFS amendment process in order to identify the

[20] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB905
[21] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB1314

best targets and program structure to align with the State's climate goals. Please do not hesitate to reach out with any questions.

Sincerely,

Matthew B. Nelson
Director of Government Affairs Strategy
Electrify America