

April 23, 2018

Chair Mary Nichols  
California Air Resources Board  
1001 I Street  
Sacramento CA, 95814

RE: Rulemaking to amend and re-adopt the Low Carbon Fuel Standard

**Dear Chair Nichols,**

Thank you for the opportunity to comment on the present rulemaking to amend and re-adopt California's Low Carbon Fuel Standard (LCFS). The LCFS is a key element of California's climate and clean energy leadership. AB 32 (Chapter 488, Statutes of 2006) began the process of decarbonizing one of the world's largest and most advanced economies. The success of policies such as the LCFS will likely allow California to meet AB 32's goal of returning to 1990 levels of emissions well before the 2020 target date. With the passage of SB 32 (Chapter 249, Statutes of 2016), California has set an ambitious, but achievable, target of reducing emissions 40% below 1990 levels by 2030.

Just as the LCFS was important to the success of AB 32, it will play an even more crucial role as the state works to attain the SB 32 target and set a course for even deeper cuts after 2030. California has achieved most of its emission reductions to date from the electricity sector and is on track to virtually eliminate emissions from power plants by midcentury; now California must rapidly accelerate emission reduction from the transportation sector to meet its 2030 target and longer term climate goals. It is therefore crucial that the program be re-adopted and positioned to achieve the fullest extent of its potential to drive down emissions and support advanced clean energy technologies.

The LCFS can build upon its track record of success. It has reduced carbon pollution emissions by more than 33 million tonnes since 2011,<sup>1</sup> by incentivizing fuel providers to reduce the carbon intensity of their fuels, blend in lower carbon alternatives or support the deployment of advanced new fuels through LCFS credits. The emphasis on clean transportation has supported over 300 California companies, employing more than 20,000

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<sup>1</sup> <https://www.arb.ca.gov/fuels/lcfs/lrtqsummaries.htm>

workers and resulted in over \$2 billion of investment in clean fuel production and distribution infrastructure.<sup>2</sup> By displacing highly-polluting petroleum fuels with cleaner alternatives, the LCFS has contributed to California's progress towards healthier air, saving over \$1 billion in health care expenditure and reducing the terrible burden asthma, heart disease and lung cancer inflict on Californians.<sup>3</sup> The LCFS is supported by a broad and diverse coalition of California business, scientific, health and community stakeholders who recognize the unique value it provides.<sup>4</sup>

The LCFS must play an even more important role in the next decade of California's climate policy. While California has taken great steps to reduce its emissions of carbon pollution, more is necessary if we are to bring our economy onto a trajectory compatible with preventing catastrophic climate change, as called for in the Paris Accord and the Under 2 MoU. Transportation represents the largest source of emissions in California, with 39% of total in-state anthropogenic emissions coming from vehicles and almost 10% more resulting from the production of transportation fuels.<sup>5</sup> On-road transportation (passenger vehicles and freight trucks) consume the overwhelming majority of transportation fuel. State and Federal policies are working to make vehicles more efficient and provide alternatives to conventional on-road transportation, but these measures cannot, by themselves, deliver sufficient reductions from the transportation sector to meet SB 32 goals. We must decarbonize the fuels which supply our transportation system in addition to consuming less of them.

The LCFS is even more important over the coming decade because it represents one of the only measures by which the state can support emissions reductions in the refinery sector, which accounts for over 45% of industrial emissions or almost 11% of the state total. AB 398 (Chapter 135, Statutes of 2017) authorizes the extension of several key carbon pollution reduction policies, but categorically excludes oil production and refining from direct regulation. It also extends highly preferential treatment under the Industrial Assistance provisions of the Cap and Trade program. The LCFS, through existing and proposed provisions relating to refinery investments, carbon capture and sequestration, innovative crude production and renewable hydrogen,

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<sup>2</sup>[http://www.calstart.org/Libraries/Policy\\_Documents/California\\_s\\_Clean\\_Transportation\\_Technology\\_Industry\\_-\\_2016.sflb.ashx](http://www.calstart.org/Libraries/Policy_Documents/California_s_Clean_Transportation_Technology_Industry_-_2016.sflb.ashx)

<sup>3</sup> [https://www.edf.org/sites/default/files/content/edf\\_driving\\_california\\_forward.pdf](https://www.edf.org/sites/default/files/content/edf_driving_california_forward.pdf)

<sup>4</sup> We note that NextGen joined a group of stakeholders from the California Delivers Coalition on a letter of support for the re-adoption of the LCFS at a higher CI target than staff's original proposal. The provisions of that letter and this one are entirely compatible.

<sup>5</sup> <https://www.arb.ca.gov/cc/inventory/data/data.htm>

can drive reductions in this sector. Achieving 40% reductions in carbon pollution by 2030 will be much more difficult if the refining sector does not reduce its emissions to keep pace with the economy as a whole. The LCFS is now the best tool at California's disposal to ensure that the refinery sector makes the investments to do its part.

NextGen has been an active participant in the extensive pre-rulemaking workshops and we commend CARB and staff for their strong science-based analysis, commitment to transparency, timely posting of relevant materials and willingness to engage in thoughtful, substantive discussion. Our comment letter reflects several months of extensive engagement on the full scope of issues related to this rulemaking. This letter will begin by addressing the issue of greatest importance in this rulemaking, the selection of 2030 carbon intensity (CI) targets and then move through a variety of other issues on which CARB has asked for stakeholder input.

In general, NextGen **strongly supports the re-adoption of the Low Carbon Fuel Standard through 2030**, with an increased CI reduction target. For the most part, we find the analysis presented by the LCFS team to be extremely high-quality and compelling. Except where noted in this letter, we support re-adoption of the LCFS consistent with the Draft ISOR and proposed regulatory text.

## **The LCFS Should Be Re-Adopted With A 2030 CI Reduction Target No Lower Than 23%**

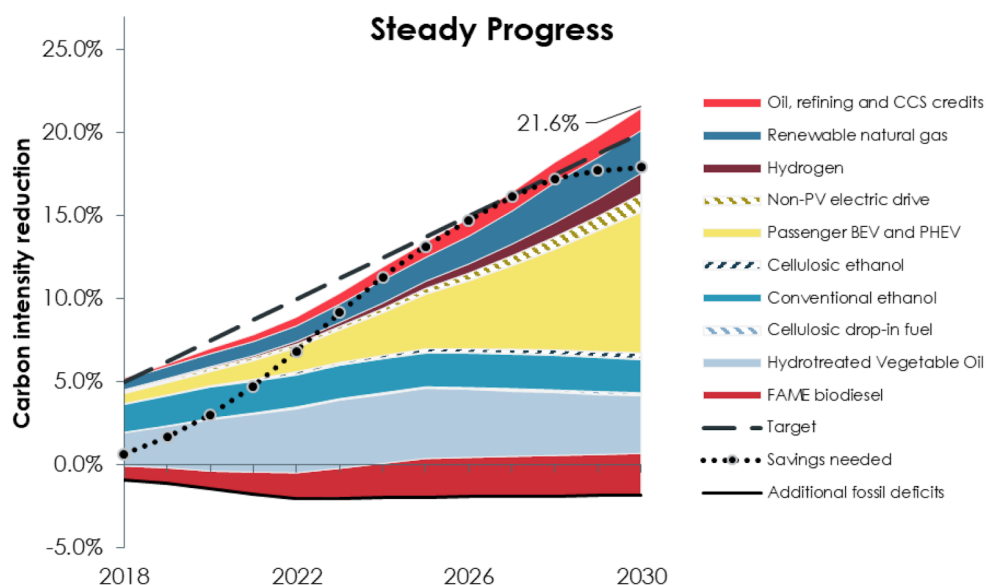
Staff have proposed that the LCFS be re-adopted with CI reduction targets increasing by 1.25% per year from 2019 through 2030, to arrive at a 20% CI reduction target by 2030. We feel that this proposal is, in general, an improvement on the trajectory described in pre-rulemaking workshops, which proposed a maximum CI reduction target of 18%, with a rapid ramp up to 2020 followed by several years of static targets before resuming target increases. We think that the proposed target trajectory can be improved upon however.

**NextGen urges the Board to instruct staff to develop one or more proposals for more rapid increases in the CI target, for the Board to consider prior to its second vote later this year. These proposals should** Recent analysis, which will be discussed in the following section, indicates that there is ample fuel capacity to support a significantly higher reduction target, which would support investment in innovative clean technologies and prevent millions of additional tonnes of carbon pollution from entering the atmosphere. The

Board must take action now to begin the process of evaluating and adopting a more appropriate CI target for 2030.

### *California's Clean Fuel Future*

This recommendation is based on the research report *California's Clean Fuel Future, Updated: Assessing Achievable Fuel Carbon Intensity Reductions Through 2030*, by Dr. Chris Malins of Cerulogy, sponsored by NextGen, Ceres and the Union of Concerned Scientists.<sup>6</sup> This report evaluates likely low carbon fuel development under a variety of reasonable technological and market conditions over the next twelve years to assess potential supplies of low-carbon fuel and LCFS credits. The report concludes that under moderate assumptions, there are ample supplies of fuel to support a 2030 CI target significantly higher than the 20% proposed by staff.

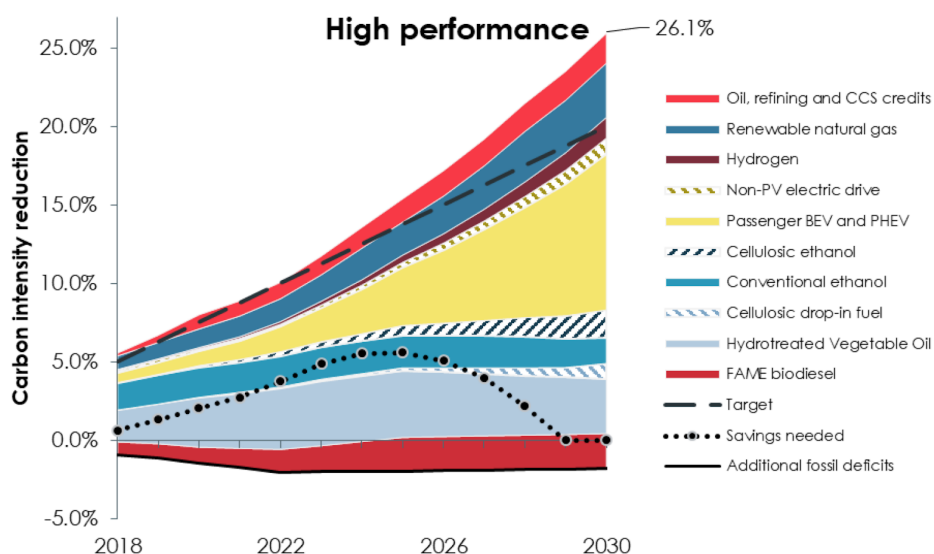


The *Steady Progress* scenario reflects assumptions about fuel pathway development that are in the moderate part of the potential range of outcomes for each fuel. It assumes that existing state policies continue to develop as planned, but does not assume any significant Federal or State policy actions, nor any transformational market shifts towards clean energy or fuels.

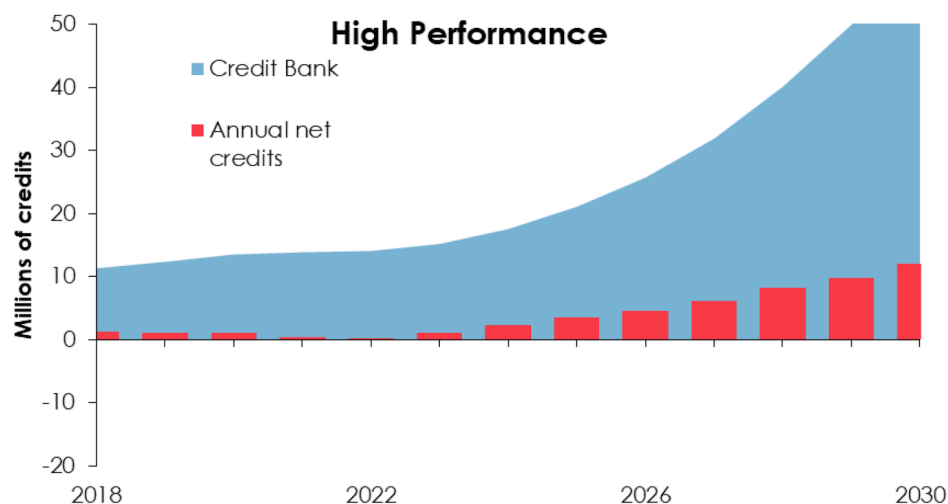
<sup>6</sup> Available at: [nextgenamerica.org/californias-clean-fuel-future/](https://nextgenamerica.org/californias-clean-fuel-future/)

The *Steady Progress* scenario differs from the scenarios modeled by Staff in the illustrative compliance scenario calculator in several key ways. It assumes that the state will meet the Zero-Emission Vehicle (ZEV) deployment target of 5 million vehicles, set by Governor Brown in Executive Order B-48-18. It also assumes slightly greater utilization of new LCFS credit generation pathways relating to investments in clean refineries, and a slightly faster decarbonization of the California electricity grid based on recent projections in the IEPR.

Given California's commitment to clean fuels and transportation, CARB's broad authority to adopt policy under SB 32 and other statutes, and the history of rapid development in the clean transportation sector over the last two decades, we think that the *Steady Progress* scenario represents the lower limit of state ambition. It is, essentially, the least California could do to reduce emissions and clean up transportation. We anticipate that California will continue its leadership in both technological development and climate policy. The State Legislature has made a strong and durable commitment to clean transportation as a major recipient of funding from the Greenhouse Gas Reduction Fund and there have been dozens of bills in the last several Legislative sessions aimed at furthering the deployment of clean vehicles and fuels. Consumers are becoming more aware of, and more interested in, alternatives to petroleum-fueled transportation. Accordingly, the deployment trajectory of key clean transportation technologies are likely to exceed those reflected in the *Steady Progress* scenario.



NextGen believes that the *High Performance* scenario better reflects what California can reasonable achieve in the next decade. This scenario reflects more rapid deployment of some technologies, notably a total of 5.8 million ZEVs by 2030 and greater deployment of electric and renewable natural gas vehicles in the medium and heavy duty sectors. Under a 20% target, the technology deployment modeled by the *High Performance* pathway massively over-performs LCFS requirements. This would results in a massive bank of credits accumulating by 2027, which would likely drive LCFS credit prices significantly downward and stifle ongoing investment that would be necessary to attain post-2030 goals (See Figure, below).



We note that the *High Performance* scenario is still far more conservative than the maximum technical potential across all low carbon fuel pathways. For example, the the assumption of 5.8 million ZEVs by 2030 is based on a bounding scenario developed by the California Energy Commission, but is lower than the 7 million ZEVs assumed by Southern California Edison in its Deep Decarbonization Scenario or similar ZEV deployment trajectories modeled by Bloomberg New Energy Finance or Navigant, which were cited in the recently adopted Scoping Plan. The *High Performance* scenario also assumes minimal credit generation from electric medium and heavy duty vehicles prior to 2024; recent commitments by major transit agencies to procure electric buses will likely yield more MD/HD electrification credit than this scenario assumes, by themselves. The *High Performance* scenario also assumes significantly lower consumption of alternative distillates, such as renewable diesel and renewable jet fuel, than any of Staff's scenarios with a 20% or higher CI target. We also note that the *High Performance* scenario assumes a modest contribution from carbon capture and sequestration, of around 1.5 million tonnes of carbon dioxide between refineries and conventional ethanol

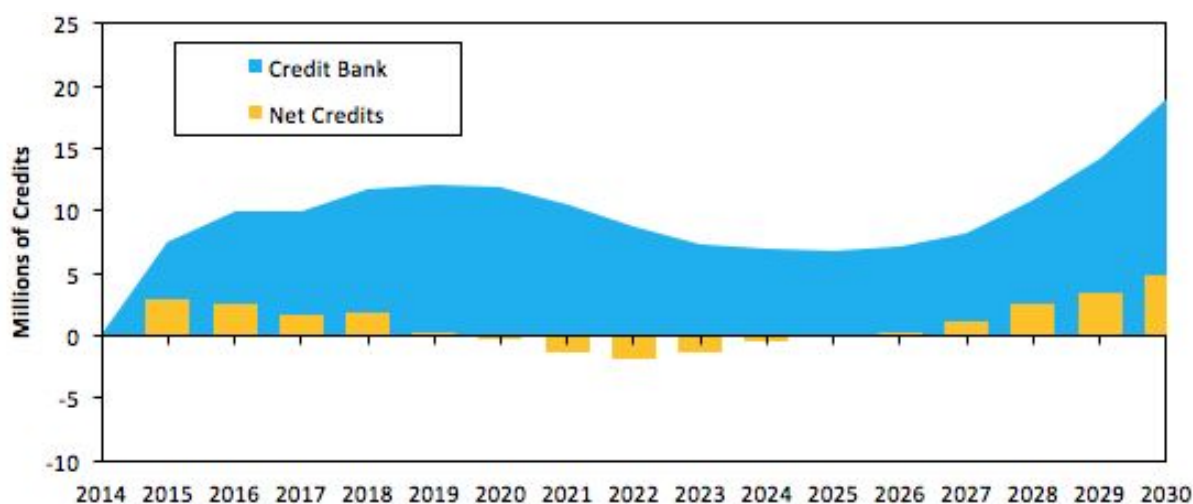
facilities in 2030. More significant deployment is quite feasible under likely credit prices through the next decade, which would result in significantly more credit generation than is modeled here.

### *The Rationale for a 23% Target*

NextGen is submitting our projection of future fuel deployment under a 23% 2030 CI target as a completed custom profile in the Illustrative Compliance Scenario Calculator, attached to this submission. Our proposed target trajectory is given below:

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	6.40%	7.80%	9.20%	10.60%	12.00%	13.40%	15.00%	16.60%	18.20%	19.80%	21.40%	23.00%

This trajectory, when applied to the *High Performance* credit generation trajectory using our High-VMT assumption yields the following credit bank projection:



This reflects modest continued growth until after 2020, at which point the substantial bank of credits that accumulated during the period of frozen CI targets in 2015-2016 is gradually spent down until the mid-2020's, when ZEV deployment reaches high enough levels that the non-linear effect they generate begins to dominate the system, resulting in robust credit bank growth and a program well positioned to continue its ambition after 2030. The credit bank drops to 6 million tonnes in 2026, or almost 50% of expected obligations, which represents a strong reserve against unexpected challenges. The robust bank of credits will insulate this

trajectory against under-performance by some technologies or fuel demand above even Cerulogy's High-VMT scenario.

Critically, the 23% target ensures a robust and predictable demand for LCFS credits in the latter years of the re-adopted program, which will give investors confidence to make major commitments of capital now, with the expectation that their investment will benefit from LCFS credits throughout the next decade.

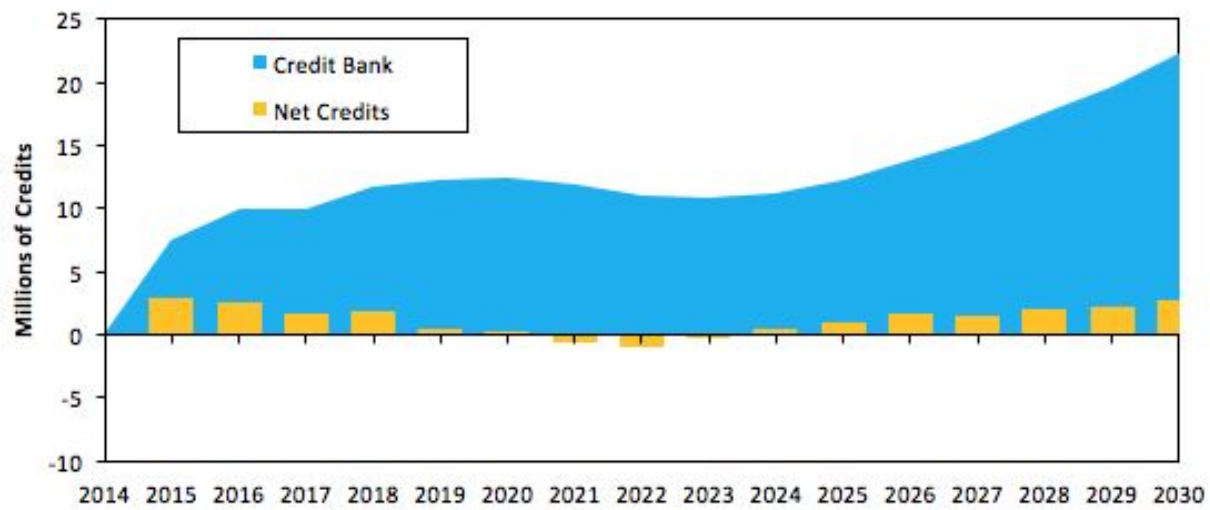
### *A 24% Target is Also Feasible Under the Same Assumptions*

The Cerulogy research indicates that credit generation under likely technological pathways tends to accelerate in the latter half of the next decade. Absent a commensurate increase in targets, this could result in the development of a substantial bank of credits which sends challenging market signals to prospective low-carbon fuel project developers considering major capital investment projects which would require a long payback. The 23% scenario proposed above includes increases in CI targets of 1.4% per year through 2024 and 1.6% per year thereafter. By shifting the CI target schedule to a slower 1.3% per year growth rate during the early years of the program, a 24% 2030 target can be reached without preserving a bank of at least 10 million credits throughout the duration of the program. Like the 23% trajectory above, the fuel demand modeled in this analysis is the more conservative High-VMT case.

Year											
2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
6.30%	7.60%	8.90%	10.20%	11.50%	13.00%	14.50%	16.00%	18.00%	20.00%	22.00%	24.00%

This trajectory yields greater emissions benefits in 2030 and beyond and more closely matches expected credit generation patterns, though the 23% trajectory in the previous section delivers greater near-term emissions benefits and a presents a more stable yearly rate of target increase. **NextGen suggests that in addition to the 23% target trajectory presented in the previous section, Staff also consider a back-loaded 24% trajectory as shown here.**





### *Designing the Re-Adopted LCFS to Handle Uncertainty*

We recognize that CARB and staff seek to preserve flexibility for the program to adapt to a dynamic market, which will almost certainly develop in ways we do not foresee at present. Staff have indicated a concern that adopting a more ambitious target increases the risk that targets would have to subsequently be adjusted downward in the event that the development of low-carbon fuels lagged projections or fuel consumption exceeded expectations. We agree that stable targets create predictable market signals and support a healthy market for investments into low-carbon fuel production and distribution infrastructure. We disagree, however, that adopting targets below the feasible maximum and planning to adjust upwards once it is clear that the market can support higher targets is a preferable option.

The Cerulogy research clearly demonstrates that there is a significant likelihood that credit generation will rapidly increase after the mid-2020's, as ZEVs become a significant fraction of the vehicle fleet. ZEVs not only generate credits through charging or fueling, they reduce deficits by displacing gasoline and generally reduce the total primary energy consumed by the transportation system, since they are several times more efficient than internal combustion engines. These effects mean that almost every scenario examined by Cerulogy indicated a rapidly growing credit bank by 2027 and in many cases, a 2030 credit balance well in excess of half the total 2030 credit obligation. Even the sensitivity cases which evaluated under-performance of the program and ran substantial deficits during the mid-2020's had regained balance by the end of the program and were on a trajectory to develop a significant credit surplus.

The fact that strong credit surpluses emerge by the late 2020's under such a wide variety of conditions will not be lost on LCFS market participants. Without a stronger target in the out years of the program, participants will perceive a very loose market in the latter years of the next decade, which will create a strong disincentive to make investments which require more than a few years to pay off, such as commercial-scale biofuel production capacity, electrical system upgrades to support high-speed charging and novel supply chains to support innovative fuels and vehicles. Potential financiers or underwriters of projects, who typically assign very little value to future policy instruments like LCFS credits at present, will see even more risk that credit prices will be unacceptably low post-2025. Conversely, a higher target, especially in the out years, creates more certainty that revenue from the LCFS credits generated by a project will remain strong throughout the full decade. Waiting for a future mid-term review or program amendment to raise targets does not create the same certainty; project developers will be unlikely to invest substantial capital in long-payback projects which depend on a favorable outcome from a regulatory action to ensure profitability. By the time that CARB had enough data to conclusively prove that credit generation was going to exceed that required to support a 20% target and completed the necessary process to develop a higher target, it would be unlikely to be adopted before the middle of the next decade. At that point, the 2030 sunset of the program would be a disincentive to major, long-payback investments. Therefore, *now may be the only window of opportunity to encourage the development of projects with a payback period longer than five years.* To encourage these longer-payback projects, CARB needs to create the expectation that LCFS credit prices will remain stable throughout the re-adopted period; a target that is reasonably expected to under-shoot likely credit generation will not produce this result.

We recognize Staff's valid concerns about the risk of having to reduce targets. These concerns can, however, be addressed through effective and transparent program design, without the need to select an overly conservative target. Specifically, we strongly suggest staff develop a list of key metrics, and targets for these metrics, that will inform CARB's thinking about the relative balance of credits and deficits through the first half of the re-adopted program. Staff should, to the greatest extent feasible, try to create a clear expectation of whether targets are likely to increase or decrease based on the performance of these metrics. Some suggested metrics are:

- ZEV fleet size
- Average ZEV driving activity (vehicle miles traveled or VMT) per vehicle
- RNG development, including average CI
- Natural gas vehicle fleet size, which determines capacity to use RNG
- Deployment of CCS, including under-construction or contractually committed
- Fossil fuel demand
- Advanced biofuel capacity
- Status of Federal and State fuel economy or tailpipe GHG emissions standards
- Status of LCA or iLUC research, which would affect CI scores under LCFS

To be clear, we are neither suggesting nor supporting a proposal to determine mid-term adjustments purely by algorithm. There will always be a need for Staff and Board members, in consultation with the public and key stakeholders, to exercise their judgment regarding targets. CARB can minimize the risk that future adjustments send a problematic signal to market participants by creating a transparent set of metrics that can give the public a sense of whether target adjustments are likely.

### ***Higher LCFS CI Targets Support California's Broader Climate Policy***

The LCFS should be considered not just as an independent policy, but as one element of California's portfolio of climate change policies. The LCFS constructively interacts with almost every other element of climate policy, by reducing the number of Cap-and-Trade permits consumed by the transportation sector, supporting the deployment of clean vehicles, providing a market for RNG that would otherwise have been lost as fugitive methane from dairies or organic waste disposal, and providing flexible demand on the grid to support renewable electricity. In almost every case, the synergistic interaction between LCFS and other climate policies is improved under a higher target.

The LCFS' effect on the cap and trade market is particularly important to consider. As the LCFS replaces high-emitting petroleum with low-emitting alternatives, fuel providers will be obligated to buy fewer allowances to cover emissions from their fuels. This will tend to put downward pressure on cap-and-trade allowance prices and minimize the risk that additional allowances will be released from the cost containment reserves. In the absence of strong complementary policies to reduce emissions from the transportation sector there will be significant upward pressure on allowance prices. during the 2020-2030 time period. The LCFS

will moderate this upward pressure, resulting in lower cost of compliance for all entities with a compliance obligation. ICF International's 2016 report supports this intuitive understanding of the dynamics between LCFS and Cap-and-Trade, they estimated that a 20% LCFS would reduce cap-and-trade allowance prices by \$29 compared to a 10% target.<sup>7</sup> Neither NextGen nor ICF claim that the savings from lower allowance prices would fully offset the costs associated with a higher LCFS target, however it is clear that these savings would significantly mitigate such costs.

It is also important to note that the LCFS typically causes lower fuel price impacts to consumers than a Cap-and-Trade program of equivalent stringency. Under the Cap-and-Trade program the full marginal cost of emission allowances can be expected to be passed through to consumers, whereas only a fraction of the marginal cost of LCFS credits are expected to be passed through, proportional to the CI reduction target. For example, most retail transportation fuels are blends of petroleum and lower-carbon biofuel, such as E10 (10% ethanol, commonly sold as retail gasoline) and B5 (5% biodiesel, commonly sold as retail diesel). In blended fuels, the high-carbon fraction of each gallon functionally subsidizes the low-carbon fraction through LCFS credit transactions. Producers see the price-based incentive to reduce emissions, but only a fraction of that price reaches the consumers, which minimizes the impact on prices at the pump. LCFS therefore offers the chance to reduce transportation emissions with less price-base impact on consumers and less risk of regressive effects than relying more heavily on Cap-and-Trade.

Numerous stakeholders, including NextGen<sup>8</sup>, have expressed concern that the recently adopted Scoping Plan assumes, without sufficient justification, massive reductions in emissions driven by the Cap-and-Trade Program. Complementary measures yield a much smaller fraction of total emissions than in previous years. Increasing the LCFS CI reduction target would reduce the burden on the Cap-and-Trade system by driving emissions down through complementary measures. Each percentage point of additional CI target yields 3-5 million tonnes of additional cumulative carbon pollution reduction through 2030 when phased in over the last 5 years of the program. The proposal we offer above would be expected to reduce emissions by a cumulative 16 million metric tons, compared to CARB's suggested 20% target.<sup>9</sup>

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<sup>7</sup> <http://www.caletc.com/wp-content/uploads/2016/08/Final-Report-Cap-and-Trade-LCFS.pdf>

<sup>8</sup> See:

[https://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=ct-3-2-18-wkshp-ws&comment\\_num=28&virt\\_num=22](https://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=ct-3-2-18-wkshp-ws&comment_num=28&virt_num=22)

<sup>9</sup> This value determined by summing total credit generation from CARB's 20%, High-ZEV, High-Demand scenario, and NextGen's Suggested Compliance Scenario. The difference between the two is 16 million metric tons.

## NextGen Comments on Other Proposed Provisions

NextGen would again like to commend CARB and the LCFS Program Staff on their extensive series of workshops, strong analysis and openness to constructive discussion throughout the LCFS rulemaking process. What follows is NextGen’s comments on a wide variety of program design issues, for which Staff have requested input from stakeholders.

### *NextGen Supports Adding a Carbon Capture and Sequestration Protocol*

Staff have proposed to add a credit generation pathway to reflect carbon capture and sequestration (CCS) to the LCFS. CCS can include a variety of methods of durably storing carbon in a manner which prevents it from returning to the atmosphere. Within the scope of transportation fuel production, the most applicable form of CCS is likely to be capture of carbon dioxide gas, compression and injection into geologic storage sites such as underground caverns, depleted petroleum reservoirs and saline aquifers. CCS is a relatively new technology; there are a limited number of demonstration projects at present, but there is a broad consensus in the extant literature that CCS is technologically feasible, scalable and could become cost effective, especially in jurisdictions which adopt a carbon price. While it may be possible for California to attain its clean energy goals without using CCS, most projections of energy system deployment compatible with limiting climate change to well below 2 degrees Celsius of maximum warming require a significant deployment of CCS.<sup>10</sup> California can continue to demonstrate its global climate leadership by helping deploy CCS at commercial scale to demonstrate the technology and begin driving costs down to commercially-viable levels.

NextGen California **supports the inclusion of CCS pathways in the re-adopted LCFS**. Given the novelty, uncertainty and risk associated with this technology, we urge CARB to find an appropriate balance between supporting maximum deployment of this technology while protecting California, and the climate, from associated risks. We urge CARB to adopt a rigorous and transparent process for certifying CCS pathways and verifying that their real-world performance matches the on-paper claims. We recognize that CCS policies work on a time horizon which is quite different than most projects relevant to the production of transportation fuels; injection of CO<sub>2</sub> may occur over decades and post-injection monitoring should extend for at least a century, in order to match the common definition of “sequestered” carbon. Over these time scales, the technology used to sequester carbon and monitor completed projects will change significantly; a body of literature reflecting

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<sup>10</sup> e.g. <https://www.ipcc.ch/report/ar5/>

real-world experience will also emerge. CARB must design its CCS protocols with the understanding that we are only beginning to develop technical fluency in CCS. As such, current policies surrounding CCS should err on the side of risk-aversion, but acknowledge that change in regulatory, technical and monitoring practices are certain to occur. As we gain more experience with CCS operations, CARB can relax provisions which may turn out to be unnecessary. If a conservative near-term policy structure proves to be an impediment to deployment of the first generation of commercial projects, it would be better for CARB to support a set of pilot projects through a process unconnected to the LCFS program than to establish pathways under the LCFS that incentivize deployment of unnecessarily risky projects.

### *Risk Mitigation from CCS Projects*

A suitably risk-averse CCS protocol should balance the need to provide as much financial incentive to project developers who can accept the risk involved in deploying novel technology against the need to protect the public from potential risks due to improper storage or catastrophic release, as well as ensure that LCFS credits are granted in proportion to actual environmental benefits of the program. We support a requirement for 100 years of monitoring after injection ceases, though we accept the premise that as our understanding of CCS improves, this may turn out to be unnecessary. We suggest that rather than requiring a comprehensive 100-year monitoring plan to be agreed upon prior to project commencement, a project review be conducted when injection ceases to determine appropriate monitoring protocols using the best available methods at the time. Project developers should be obligated to demonstrate that carbon is being durably sequestered for a century after injection terminates, but the specific method used to make that determination can be made later, with the benefit of additional understanding.

Similarly, CARB should require that project developers remain liable for the risk that CO<sub>2</sub> may be released from the project at some date after injection. In the event that a sequestration project loses containment of part or all of the sequestered CO<sub>2</sub>, project developers should be liable for costs associated with remediating immediate environmental harms, preventing further loss of contained CO<sub>2</sub> and the damage to the climate from the release of carbon pollution. These risks may be addressed through provision of a suitable risk bond by the developer, or by claw-back provisions relating to LCFS credits in the event of release - though we would note that over the time scales relevant to CCS projects, claw-back provisions may be difficult to enforce in practice. Alternatively CARB may wish to consider holding part or all of the LCFS credits, or other carbon instruments, in escrow and transferring them to the project developer over the duration of the project on a schedule that

reflects the time-adjusted value of the sequestered carbon. Since CO<sub>2</sub> has a long atmospheric lifespan, delaying emissions reduces the impact of climate change over most time scales relevant to policy making, even if aggregate emissions remain the same. This is to say, it is better for the climate to release a ton of carbon in the future than it is today.<sup>11</sup> CARB may wish to base protocols relating to the release of sequestered CO<sub>2</sub> on the basis of rewarding project developers for the time carbon is sequestered, in the event of catastrophic release. Holding some LCFS credit value in escrow and distributing to project developers over time to reflect the value of the time sequestered carbon has spent underground reflects the risk of reversion, creates an incentive to maintain the project through its post-injection phase and ensures that developers will have a stream of revenue available for ongoing maintenance and monitoring.

### *Potential Scope of CCS*

The combination of LCFS credits and Federal Section 45 (Q) tax credits could ultimately yield net revenue of over \$150 per tonne for sequestered carbon, well over the value that multiple authors have concluded is necessary to support industrial-scale CCS in a variety of near-term applications.<sup>12</sup> We feel that the incentive provided by the LCFS and 45 (Q) credits is likely to be sufficient to support the deployment of a sufficient number of early projects, which will provide critical support for the CCS industry while providing valuable experience to CARB regarding real-world performance and regulatory considerations. NextGen and the Union of Concerned Scientists evaluated the potential for near-term deployment of CCS projects under the LCFS and found there was significant potential in at least two categories: capture of ethanol fermentation tank emissions and as modification to steam methane reformers (SMR) at existing petroleum refineries.<sup>13</sup> These two pathways take advantage of high-concentration or high partial-pressure streams of CO<sub>2</sub> that occur in existing industrial processes. These streams offer a favorable environment for capturing CO<sub>2</sub> at relatively low cost, which makes them likely options for early commercial deployment.<sup>14</sup> This analysis concluded that there was potential for several hundred thousand to several million tonnes of CO<sub>2</sub> sequestration per year through 2030 from these sources.

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<sup>11</sup> Kendall, A. (2012). Time-adjusted global warming potentials for LCA and carbon footprints. *International Journal of Life Cycle Assessment*, 17(8), 1042–1049. <http://doi.org/10.1007/s11367-012-0436-5>

<sup>12</sup> <http://www.iea.org/publications/freepublications/publication/TechnologyRoadmapCarbonCaptureandStorage.pdf>

<sup>13</sup> Add URL for re-submitted CCS memo here.

<sup>14</sup> See: D.L. Sanchez, N. Johnson, S. McCoy, P.A. Turner, K.J. Mach. “Near-term deployment of carbon capture and storage from biorefineries in the United States” Proceedings of the National Academies of Sciences (In Press). for more information on CCS at ethanol facilities and “Current Central Hydrogen Production from Natural Gas with Sequestration” at [https://www.hydrogen.energy.gov/h2a\\_prod\\_studies.html](https://www.hydrogen.energy.gov/h2a_prod_studies.html) for more information on CCS at steam methane reformers.



There is potential for significantly more deployment of CCS than just these applications, however. Post-combustion capture, in which CO<sub>2</sub> is scrubbed from normal combustion exhaust, may also be possible at costs below the expected combination of LCFS credits and 45 (Q) tax credits. This method of capture is potentially applicable to almost any large-scale stationary combustion process including power plants, refineries and biofuel production facilities. If post-combustion capture is widely deployed at all possible points in the transportation system, there could be the potential for tens of millions of tonnes of total LCFS credit generation per year. This would necessitate a fundamental re-examination of California's climate and energy policies. If post-combustion capture deploys widely, CI targets in excess of 30% may be required to ensure that the LCFS market stays strong enough to support alternatives to petroleum. While we feel commercial deployment of post-combustion CCS before 2030 is unlikely to occur at scales sufficient to necessitate such a re-examination, we urge CARB to monitor this technology closely and be prepared to take action.

#### ***NextGen Opposes Proposed Capacity Based Infrastructure Credits***

Several stakeholders have requested that CARB institute a new protocol for awarding LCFS credits for the capacity of installed fueling infrastructure, rather than solely for the quantity of fuel dispensed, as is the practice under the current program. This concept is most often discussed in regards to hydrogen fueling stations, however stakeholders have also proposed extending it to electric or natural gas vehicle fueling equipment as well.

**NextGen California opposes the creation of capacity-based LCFS credit generation pathways.** We see this as an abrupt departure from the established, and quite successful, structure of the existing program. Fueling infrastructure providers already have ample incentive to install commercial and/or public fueling facilities: they are eligible to claim the LCFS credits from fueling activity at their stations. Adding a new pathway breaks the fundamental relationship upon which the LCFS is based: that credits are awarded for activities which actually reduce emissions. Creating this new credit pathway would establish a troubling precedent that the program will assign credits, which have real financial value, based on uncertain expectations of future emission reductions. Doing so would essentially move the risk that a project will fail to live up to its projections onto California residents; if a given piece of fueling infrastructure which was supported by capacity-based credits did not produce the expected emissions cuts then California the LCFS would not yield the actual reductions implied by the program's credit transactions and the state would be off track to hit its SB 32 goals, other programs Would have to make up the shortfall. The resulting costs would be passed on to consumers.



Capacity-based credits also risk conflicting with, or unnecessarily complicating, energy infrastructure planning at other agencies. The California Energy Commission and California Public Utilities Commission both support infrastructure deployment through a variety of programs. CARB would have to consult with either or both agencies before awarding capacity-based LCFS credits, or risk interfering with, or duplicating, efforts by those other agencies. Infrastructure planning at the project level is a more appropriate for other programs outside the LCFS.

We recognize that many fueling infrastructure developers are finding it difficult to develop project capital from expected LCFS credit revenue, this problem is common throughout the alternative fuels space. We support efforts to make LCFS credits a more secure financial instrument which could back debt or equity for project capital. We support efforts to reduce policy risk, which is a main reason why financial institutions often under-value future LCFS credit revenue, and we would support efforts to address this problem in a more appropriate way, such as a State-backed green bank, loan guarantees or policy risk insurance.

#### ***NextGen Supports Using LCFS Credit Value to Provide Point-of-Sale ZEV Rebates***

As the Cerulogy research demonstrated, ZEVs, especially battery electric and plug-in hybrid vehicles, are a key part of California's long-term sustainable transportation future. The primary limiting factor on their total contribution towards attaining the state's climate and clean air goals is rapid deployment. Sales will need to rapidly expand in order to meet the 5 million ZEV target from Executive Order B-48-18. Rebates are a key tool to drive early sales and have significantly contributed to ZEVs rapid growth from essentially zero a decade ago to over one percent of new car sales.

At present, the LCFS supports several rebate programs offered through utilities. LCFS credits from un-metered household charging are transferred to utilities, who are required to use the revenue to support the continued expansion of the electric vehicle market. Many offer rebates to EV owners, though these rebates may not be received by the purchaser until weeks or months after the vehicle is purchased. Owners cannot currently determine their eligibility for rebates at the time and place of sale; they must either apply after they purchase the car and risk being denied a rebate, or they must pre-qualify for a rebate under a program recently developed by the CVRP administrator. Pre-qualification must occur several days in advance of purchase, which presents a significant procedural hurdle for potential buyers and does not align well with the dynamic, incentive-based

sales approach of most auto dealers. Lower-income purchasers are particularly affected, as they may lack the funds to pay a higher price for a vehicle and wait for a rebate.

The solution is a point-of-sale rebate, which can be deducted from the purchase price, with the rebate being seamlessly conveyed to the dealer. **NextGen strongly supports efforts to develop a point-of-sale rebate funded by revenue from un-metered residential charging LCFS credits.** Point-of-sale rebates are widely understood to be more effective at driving consumer behavior and a rebate of this type would more effectively support existing State efforts to accelerate the penetration of ZEVs into the market. A point-of-sale rebate would almost certainly deliver more value to the state than the current slate of utility-sponsored rebate programs.

Some EV manufacturers, notably Tesla, have proposed a model in which unmetered household charging credits are assigned to vehicle manufacturers at the time of sale and the value of those credits are converted into a rebate by the manufacturer. Such a program must be carefully designed to ensure that the interests of Californians, including current EV owners, prospective EV owners and utility customers are protected. In particular:

#### *LCFS Credit Revenue Must be Predominantly Used to Support EV Deployment*

Concepts for a LCFS-funded rebate program that have been put forward by EV manufacturers often indicate that they will recover administrative and financial costs from the LCFS revenue, including the cost of capital needed to convert ongoing streams of LCFS credit revenue into up-front rebates and a risk premium to reflect policy or market risks. We recognize the need for manufacturers to cover administrative costs and agree that a reasonable risk premium is warranted given the uncertainty surrounding any climate policy instrument.

Manufacturers should not, however, routinely make substantial profit on the administration of a program meant to dispose of policy instruments which support a public good, clean air. Manufacturers will have ample opportunity to derive profit from increased sales of their product. If the cost and risk involved in managing a rebate program is too great for them to bear, there are several non-profit organizations with deep expertise in managing rebate programs which could do so.

To this end, any organization which seeks to receive LCFS credits for the purpose of providing a point-of-sale rebate must provide a transparent proposal for administering the program for CARB and allow for public

review. This must include:

- A clear indication of both expected revenue and expenditure
- A verifiable plan of action to cover the possibility that LCFS credit prices will be above plan assumptions, resulting in more revenue than anticipated.
- Clear identification of any administrative costs, financing costs, risk premiums or other revenue which will not directly go towards ZEV deployment
- Demonstrated technical capacity to assess the number of LCFS credits generated by the charging of the vehicles for which LCFS credits will be assigned to the manufacturer.
- Demonstrated technical capacity to exclude charging at public, commercial, or independently-metered charging stations from the assessment of total LCFS credit assignment. Credits from these stations shall remain with the station operator, as under the current LCFS protocol.
- Regularly scheduled reviews to demonstrate that the program is actually performing in line with expectations.
- A commitment to allow an independent audit at CARB's discretion

We also strongly recommend that if CARB chooses to develop a LCFS-funded point-of-sale rebate protocol along the lines proposed by EV manufacturers, they do so with the consent of utilities who currently administer programs to use unmetered residential charging credits. We appreciate auto manufacturer's interest in developing an effective rebate program, and believe it will be most successful if implemented with the cooperation of utilities and with robust oversight.

#### *A Possible Alternative to a Manufacturer-Administered Program*

We intend to continue working with stakeholders to develop a mutually agreeable solution by which LCFS credits could be used to fund a point-of-sale ZEV rebate. Designing a manufacturer-based program is complex and requires coordination by a broad variety of stakeholders. It may not be practicable to do so under the timeline of the current rulemaking. In that event, we **suggest that CARB allow owners to assign unmetered residential charging LCFS credits to the organization or recipient of their choice at the time of sale.** We suggest that CARB retain a role in approving programs that are eligible for assignment, using criteria similar to existing provisions regarding utility use of LCFS credit revenue.

This would allow manufacturers, auto dealers, financial institutions and other stakeholders to offer a range of rebate options at the time of sale. In practice, these could be provided as a point-of-sale rebate by contractual agreement between the entity offering the rebate and the dealer. We anticipate that under this model, manufacturers would be well-positioned to offer rebates like those proposed by Tesla and other manufacturers.

Allowing assignment of unmetered charging credits allows institutions to experiment with various models of financing and rebates without having to seek regulatory approval for each modification to the program. It is entirely possible that this change alone could facilitate a broad transition to a system much like that proposed by manufacturers, without the State having to unilaterally decide upon that as the solution.

### ***NextGen Supports the Adoption of Time-of-Use Charging (“Smart Charging”) Credits***

LCFS program staff have proposed adding a Time-of-Use EV charging, or “Smart Charging,” bonus credit. This would be applied in addition to the normal baseline credits for charging an EV. Charging activity that occurred between 9:00am and 4:00pm would be eligible for a credit of an amount which reflects the expected emissions savings from using curtailed solar energy rather than the normal marginal grid mix. The estimated emissions savings would vary on a quarterly basis and be regularly updated to reflect current grid conditions.

### **NextGen California strongly supports the inclusion of Smart Charging credits, per Staff’s proposal.**

Significant amounts of solar energy are regularly curtailed between 9:00am and 4:00pm, encouraging vehicle charging during that time can make use of this otherwise wasted resource. This credit particularly supports broad deployment of workplace charging infrastructure, which is a critical need in California.

We suggest Staff consider whether the Smart Charging credit could be expanded to provide a dis-incentive for charging during times of peak grid demand, such as 5:00pm to 9:00pm, however we recognize that dis-incentive provisions are more complicated than incentives, and so may take more time and effort to design. We also encourage CARB to move as quickly as is feasible towards routinely using real-time telematic or charger data to base incentives around actual grid conditions, rather than seasonal estimates.

### ***NextGen Supports Renewable Charging Credits, Provided They Yield Additional Emissions Reductions***

Staff have proposed adding a new LCFS credit pathway, similar to the Smart Charging pathway discussed above. This would function as an additional credit available to EVs which charge using zero-carbon renewable electricity (RE). This proposal would support the continued deployment of renewable energy while also reducing transportation-related emissions. RE credits would be available for charging activity supplied under a Green Tariff rate plan, which procures renewable energy sufficient to meet the customer's aggregate energy needs.

We, along with other stakeholders, have expressed concern that the RE provisions in the proposed rule could lead to significant issuance of RE charging credits without a commensurate reduction in emissions from either the electrical grid or the transportation system, compared to issuing credits at the grid average rate. California has significantly over-complied with current Renewables Portfolio Standard (RPS) requirements, which means that there is an excess of renewable energy available to in-state utilities and balancing authorities, compared to their regulatory obligations. This excess means if a utility customer switches from a standard grid-average plan to a Green Tariff plan, they will nominally be getting lower-emitting power but in reality, they could merely exchange their grid mix supply for some of the excess renewable supply, resulting in net emissions from the grid that have not changed as a result of their switch. Charging station operators could sign up for a Green Tariff plan, receive additional LCFS credits for their activity without actually reducing emissions more than if they had received credits according to the standard grid average rate. This breaks the fundamental relationship upon which the LCFS is based: market-based incentives are granted for activity which actually reduces emissions compared to the status quo.

Since the initial concepts were presented in 2017, Staff have clarified that Green Tariff plans must also demonstrate that they must procure renewable energy which is in addition to any required under other policy mandates. Specifically, § 95488.8 (i)(1)(B)(2) of the proposed regulation order states:

“All electricity procured by any LSE for the purpose of claiming a lower CI must be in addition to that required for compliance with the California Renewables Portfolio Standard or, for hydrogen produced outside of California, in addition to local renewable portfolio requirements”

We urge CARB to clarify this provision to ensure that it results in a strict application of an additionality test for any renewable electricity which seeks eligibility for RE credits. Specifically:

- This provision should specify “... in addition to that required for compliance with the California Renewables Portfolio Standard, *or other renewable energy requirements...*” This will reflect the fact that other Federal, State or Local policies may require the deployment of RE and any such deployment would be subject to the same additionality concerns as relate to the RPS. Electricity used to satisfy voluntary programs or which has been credited under other market-based mechanisms should still be eligible for compliance.
- “In addition to compliance with the California Renewables Portfolio Standard” should be clarified to indicate that renewable energy in excess of that standard’s requirements in a given year is not necessarily eligible for RE charging credits. To satisfy additionality, renewable electricity must have been generated by a resource which has never been used for compliance with the RPS or another renewable energy mandate. If electricity from a generator or Renewable Energy Certificates from a generator are, at some point, used to demonstrate compliance with a renewable energy mandate, this is strong evidence that the generator would have been operating whether or not LCFS credits were part of its revenue structure; it should rightly be considered part of the existing grid mix and EV charging it supports would not result in additional emissions reductions.

This functionally means that RE generators must choose whether they wish to sell in to the LCFS credit market or the broader pool of grid resources. While this limits the potential market for RE generators to some extent, we are confident that the extra revenue associated with LCFS credits, and the potential for dedicated contractual agreements, such as Power Purchase Agreements (PPAs) with charging service providers or other aggregators of charging activity using book-and-claim accounting will create a robust market for RE generation which can be dedicated to LCFS charging.

We note that the need to exclude generators which were previously used for compliance with RPS or other renewable electricity requirements is a direct result of California’s significant over-compliance with its RPS (which is, in most respects, a positive development). In areas where no excess of renewable electricity above mandated requirements exists, charging on a Green Tariff or similar rate plan implies additional renewable energy must be procured. In jurisdictions where there is no excess generation of renewable energy, which may include California as RPS requirements increase, the requirement in this point could be relaxed.

- The provision should clarify that RE credits should be issued only when there is clear evidence that the charging behavior which generated those credits resulted in real reductions in emissions, beyond what would have occurred in absence of the RE credits.

We applaud CARB and LCFS Program Staff for recognizing the need to ensure RE credits yield additional reductions compared to a business-as-usual case. **NextGen supports the inclusion of Renewable Energy charging credits, provided that they satisfy a strong test of additionality.** The clarifications described above would help develop a suitably strong test of additionality.

### *NextGen Supports Proposed Alternative Jet Fuel Provisions*

At present, air travel accounts for approximately 10% of transportation-related GHG emissions in the U.S. Decarbonizing this sector presents a particular challenge for policymakers since many of the technologies which show promise towards reducing on-road emissions will struggle to meet the technical requirements for commercial air travel. Low-carbon analogues to petroleum-based jet fuel, such as biofuels, are widely regarded as an obligatory element of a sustainable transportation system. The LCFS is therefore an excellent framework from which to develop market-based incentives.

**NextGen strongly supports the inclusion of low-carbon alternatives to conventional petroleum jet fuel under the LCFS.** We agree with the basic principles outlined by Staff, but suggest one additional consideration:

We recommend that CARB thoroughly evaluate the equity and environmental justice impacts of including alternative jet fuel in the LCFS. We are concerned that since alternative jet fuels are fairly analogous to renewable diesel - they are both produced by the catalytic hydrogenation of non-fossil oils such as vegetable oil, used cooking oil or tallow - and so could lead to competition for feedstock and production capacity. This competition could affect progress towards reducing diesel pollution in California, which is a critical step towards addressing many of the critical air quality issues affecting disadvantaged communities. Similarly, the incorporation of alternative jet fuels under the LCFS will ultimately result in a net transfer of revenue from on-road fuels, as gasoline and diesel providers purchase credits for compliance, to aviation fuels, which will be one source of such credits. Given that the typical airline passenger is of higher-income than the typical driver, this wealth transfer could lead to dis-equitable outcomes. We wish to be clear: we are not aware of any research

into the equity impacts of these particular fuels in a context relevant to California and have seen no evidence that indicates that including alternative jet fuels under the LCFS will lead to dis-equitable outcomes. We anticipate that the equity-promoting impacts of cleaner air around airports and reducing the impacts of climate change are of greater magnitude than the concerns discussed above. Given California's strong progress in the promotion of justice and equity, it is worth taking a deliberate and objective look at these provisions before they become deeply entrenched within the program.

### *NextGen Supports Linking California's LCFS with Equivalent Programs in Other Jurisdictions*

California's LCFS has become a model for global clean fuels policy. British Columbia and Oregon have already adopted similar programs, Washington State has attempted to do so and the Canadian Federal Government is currently developing a Clean Fuels Program largely based on similar concepts. Several stakeholders have explored the possibility of linking LCFS credit markets, in order to improve liquidity, reduce the risk that fuel producers will relocate fuel-consuming activity into jurisdictions with no fuel carbon policy ("leakage"), and maximize the total market signal to innovative clean fuel producers.

**NextGen supports linking California's LCFS with equivalent programs in other jurisdictions, provided that this does not result in a net reduction of aggregate program stringency and that California retains authority to set its own reduction targets.**

Linking LCFS credit markets, in a manner analogous to the cap-and-trade program linkages under the Western Climate Initiative can help improve the power and efficiency of the LCFS, while reducing administrative burdens. This is particularly useful for smaller jurisdictions which may lack the capacity to develop and administer a LCFS of their own. Linked markets also reduce the incentive for leakage by encouraging action in other states or regions and reducing the number of uncontrolled jurisdictions to leak to.

We urge Staff to explore opportunities for linkage with other LCFS programs, provided they use equally robust and stringent methods for assessing the carbon intensity of fuels as CARB. We recognize that since California's LCFS targets are significantly ahead of other jurisdictions, since its LCFS has been in effect for far longer, it will be difficult for potential new partners to adopt a LCFS at an equivalent nominal target. Where fuels are credited in jurisdictions other than the one to which they're physically delivered, their credit generation should be assessed relative to the targets in the crediting jurisdiction, rather than the one of delivery.



By allowing some limited flow of credits across borders, linked markets can reduce emissions from the transportation of fuels to market. We urge Staff to seek an appropriate balance between maximizing overall system efficiency and ensuring that communities in high-demand jurisdictions receive air quality and economic benefits from the fuels used to satisfy their obligation under a linked program.

***NextGen Supports the Including Credit Generation Pathways for Co-Processing of Biomass Feedstock and Emissions-Reducing Investments at Refineries, Provided they are Adequately and Transparently Justified***

Staff have proposed including credit generating pathways relating to co-processing of biomass feedstock in petroleum refineries as well as from investments in emission-reducing technology. There is ample evidence in scientific literature that both of these pathways can reduce emissions from transportation fuel production systems. Accordingly, **NextGen supports the inclusion of these pathways, provided that sufficient data is made available to CARB and the public to ensure they provide real, verifiable and additional emissions reductions from the full fuel production system they affect.** Specifically, Staff has asked for input on the scope of data which should be provided by developers of these types of projects in order to certify a pathway. Refinery operators, who would be the most common applicants, have argued that data on emissions should be limited to the specific refinery process affected by the proposed investments which would result in credit generation.

Process-specific data is sufficient in cases where the proposed project has no effect on any other process in the refinery. Simple efficiency improvements, such as insulation, displacement of fossil energy by renewable energy for heat or pumping burdens or reductions in waste may be amenable to process-specific analysis. Refineries are complex technological systems in which materials and energy are routinely exchanged between various production units, with coproducts often utilized to maximize production of revenue-generating material and heat exchangers used to recover waste heat. Accordingly, relatively small changes to a single process may have far-reaching indirect effects within the refinery. For example, reducing waste heat from a process may require more energy inputs elsewhere if energy from the waste heat stream was recovered for use in other processes. Improving conversion efficiency in a process may reduce the flow of useful co-products to other processes, necessitating their make-up with additional material. In these cases a consequential, facility-level analysis is the only way to accurately assess actual impacts.

Where project developers claim that a process-specific analysis is sufficient to quantify the emissions reduction attributable to a given project, CARB should require project applicants to provide sufficient data to conclusively demonstrate that there are no significant effects on other processes within the refinery. The burden of proof should rest on the project developer to demonstrate the sufficiency of process-specific analysis and CARB should err on the side of a more expansive analytical scope where there is uncertainty regarding the scope of impacts. We recognize that some of the data needed to substantiate project developers' claims may be confidential business information, in this case CARB can take appropriate precautions to protect such data, however it must ultimately be made available to CARB and, if applicable, third-party verification bodies.

For investments in refinery efficiency, CARB should require that such investments improve efficiency beyond industry standards before they are eligible to generate reduction credits. LCFS credits should only be awarded where investments represent a clear effort to do more than regulation, industry standards or normal retrofit schedules would otherwise require. CARB should seek to develop a set of standards which clearly define industry best practices and use that as a guide to help determine which projects qualify for LCFS credits. CARB should look to resources like global regulatory standards, industry best practice documents and refinery benchmarking efforts.<sup>15</sup>

### ***NextGen Supports the Inclusion of Charging Credits for New Modes of Transportation***

At pre-rulemaking workshops some stakeholders inquired as to whether charging activity that supported new modes of electrified travel, such as e-bicycles or electric aircraft, including drones, would be eligible for LCFS credits. Staff requested input from the community on this subject. At these workshops, some stakeholders expressed concern that these modes would result in a net increase in energy used by the transportation sector since they may increase the amount of flying, in the case of electric aircraft, or displace active or public transportation in the case of e-bikes. We feel that it is unlikely that such vehicles will account for a significant amount of energy consumption relative to the transportation sector as a whole, so including these new modes under the LCFS can help provide support for innovative modes of travel.

We suggest, however, that CARB limit the maximum credit generation for fuels delivered to these new modes to a relatively small fraction of the total credit generation until there is sufficient data to assess whether they, or any novel mode of transportation, would result in a significant net increase in transportation energy

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<sup>15</sup> e.g. the Solomon and Associates refinery benchmark <https://www.solomononline.com/benchmarking>

consumption. The LCFS is built on the fundamental assumption that alternative fuels displace conventional, high-emitting ones. If this displacement turns out to be untrue for some modes, CARB may need to re-assess their treatment under the LCFS.

***NextGen Urges CARB to Direct More Resources Towards Improving Research Into Indirect Effects of Fuel Production, Especially Indirect Land Use Change***

The scientific foundation of the LCFS is Life Cycle Analysis, which is itself, a comparatively new method of analysis. New data and analytical techniques emerge regularly, as well as a better understanding of the strengths and limitations of this technique. Recent authors have suggested that a focus on direct analysis of material and energy flows within the narrowly-described boundaries of a production process (often called “attributional analysis”) may overlook many critical impacts and yield an inaccurate assessment of actual emissions.<sup>16</sup> This is especially true with regard to effects that are mediated through domestic or international markets, where production processes may compete for resources in ways that are difficult to accurately characterize. These indirect effects, especially indirect land use change (iLUC), can result in significant emissions, particularly from biofuel production.

We believe that CARB, and the LCFS Program Staff, have done an excellent job at assessing the full range of extant literature on indirect effects and iLUC and the LCFS is on the cutting edge of regulatory sophistication where this is concerned. We must acknowledge, however, that the literature on indirect effects is far from complete and we cannot rule out the possibility that the current iLUC values used by the LCFS substantially underestimate actual effects.

**NextGen urges CARB to dedicate more research support towards a better understanding of domestic and international markets for feedstocks used in low-carbon fuel production.** In particular, we feel more attention is necessary to understand indirect effects and cross-product substitutions in the edible and inedible oil and tallow market. These fuels comprise the preferred feedstock for biodiesel, renewable diesel and

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<sup>16</sup> e.g. Plevin, R. J., Delucchi, M. A. and Creutzig, F. (2014), Using Attributional Life Cycle Assessment to Estimate Climate-Change Mitigation Benefits Misleads Policy Makers. *Journal of Industrial Ecology*, 18: 73-83. doi:[10.1111/jiec.12074](https://doi.org/10.1111/jiec.12074)

alternative jet fuel production. If CARB's assessment of indirect effects is inaccurate, the LCFS could be supporting inefficient, or harmful environmental and economic outcomes.

If updated research demonstrates that previous fuel pathways inaccurately assess actual emissions, CARB should adjust existing fuel pathways to match updated data. We recognize that retroactively changing fuel pathway CI scores may impact financial stability of producers of affected fuels and are willing to support a gradual, or phased-in transition to more accurate CI values. A science-based program like the LCFS cannot, however, support credit generation based on inaccurate data indefinitely.

***NextGen Suggests CARB Review How the LCFS Assesses Additionality Where Other Policies Change Emissions From a Transportation Fuel System***

Additionality, in life cycle analysis, means that effects must have been caused by a particular project, product or process in order for their effects to be considered as a result of that project, product or process. In essence, a change in emissions must be predominantly because a given fuel is used if that fuel is to receive LCFS credits for reducing emissions. Under a comprehensive climate portfolio, like California's, there are likely to be multiple policies affecting emissions of projects, processes or products which are inputs to a transportation fuel. CARB should seek to balance the scientific imperative to base policy on an assessment of emissions under the strongest methodology against the need to create a stable and sufficient incentive for deployment of advanced fuel systems.

Staff have indicated that at present, they typically allow credit generation to claim benefits from reduced emissions of greenhouse gases for up to 10 years after such emissions would have been controlled by other policies. There is no scientific justification for why emissions should be credited as reductions for 10 years after they would have, in fact, been reduced. We urge CARB to re-evaluate such provisions and determine whether so long a period of crediting after the emissions have been controlled is, in fact, necessary to support critical investment in low-carbon fuels. We urge Staff to err on the side of science when making decisions relating to additionality.

### *NextGen Urges CARB to Improve Transparency Relating to Details of Method 2 Pathway Applications*

CARB publishes all Method 2 pathway applications for fuels seeking to generate LCFS credits, however, in most cases the critical quantitative information is redacted as confidential business information (CBI). We understand that CARB has an obligation to protect the CBI of pathway applicants, however this protection removes so much data that it is functionally impossible for independent researchers to verify claims made by applicants. The extensive redaction also reduces the value of Method 2 pathway applications to researchers and limits the evolution of research in this space.

We urge CARB to improve the transparency of Method 2 applications where possible. We ask Staff to review current protocols related to redacting CBI to determine whether more transparency is possible without improperly exposing CBI. Even if there are no legally feasible changes to the treatment of any particular pathway, we ask CARB to explore whether aggregated average quantitative data from similar pathways could be released. This would protect the CBI of any particular company, but provide a better lens for researchers to see real-world behavior of advanced clean fuel production systems, which will accelerate relevant research into this space and help better calibrate models against real data.

## **A Strong LCFS Positions California for Success**

CARB has an opportunity to build upon many years of success by extending a strong LCFS program through 2030 and building upon the foundation it has laid. California has an opportunity to continue its leadership in climate, clean energy and transportation policy for years to come.

We again thank CARB and the LCFS Program Staff for the opportunity to comment on this critical rulemaking and for their effort, thoughtfulness, transparency and receptiveness to feedback through this process. Their work has produced a strong and set of proposals for the LCFS program and with a few amendments, as discussed in this letter, we are confident that the LCFS can achieve its full potential to deliver cleaner air, innovative technology and sustainable transportation. We look forward to continued engagement on this matter as it continues through the rulemaking process.



Thank you,

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NextGen California