

To: Cheryl Laskowski
From: Jeremy Martin
Date: June 6, 2023
Subject: LCFS Comments

Thanks for the opportunity to comment on this important regulation. The Low Carbon Fuel Standard (LCFS) is an important element of California's comprehensive set of policies to address climate change and transition the transportation sector from one dominated by petroleum to one powered primarily by renewable electricity. The LCFS provides vital support for transportation electrification, and as such it underpins other critical regulations that help cars and trucks transition to zero emission vehicles. The sharp and sustained decline in LCFS credit prices creates broader problem for these associated policies and should be promptly addressed. Beyond California's borders, the LCFS is an important policy model that other states have adopted and are considering, and that could one day be the basis for an improved federal fuels policy to address the many deficiencies of the Renewable Fuel Standard. This forthcoming rulemaking will be essential to allowing the LCFS to set the best possible example for these other jurisdictions. The LCFS must be brought in line with the scoping plan and recently enacted legislation. CARB should also improve the policy based on lessons learned and input from affected communities and proactively address opportunities and challenges arising from the vastly transformed federal policy context.

An auto-acceleration mechanism is not the right remedy to the challenges facing the LCFS at this time.

The auto-acceleration mechanism discussed at the May 23rd workshop is an interesting proposal to remedy the drop in credit prices, but ultimately it reflects a myopic diagnosis of the challenges facing the LCFS. An auto-acceleration mechanism may be appropriate to make relatively small adjustments to the policy stringency between rule-making processes. Especially in other jurisdictions, where the regulator lacks the flexibility CARB has to adjust program stringency, the case for an auto-acceleration may be more compelling. However, the primary cause of the recent drop in credit prices has been the large and counter-productive surge in the use of lipid-based renewable diesel in California. The remedy to this surge is not to raise the standard, instead CARB should amend the policy to address the core problem by limiting lipid-based fuel compliance (see below). Raising the stringency of the policy to absorb credits will increase costs for California drivers without a commensurate climate benefit. If CARB does implement an auto-acceleration mechanism it should be limited to making one or two modest changes to stringency while a rulemaking process is undertaken to understand what is driving the departure from projections and whether guardrails or adjustments to the stringency may be warranted.

Prioritize high quality emissions reductions and cobenefits in California over high targets based on bogus credits that will increase regressive pass-through costs for California drivers.

CARB should tighten the rules of the LCFS to focus on reducing emissions from California transportation fuels rather than simply raising targets to absorb a huge quantity of bogus credits that will create an unfair burden on drivers of ICE vehicles in California. Specifically, CARB must constrain the concentration

of lipid-based biofuels required for compliance with the Federal Renewable Fuel Standard (RFS) into California and stop extravagant subsidies for exaggerated and non-additional claims of avoided methane pollution from manure lagoons nationwide. Credits from lipid-based renewable diesel and avoided methane from manure have flooded the California LCFS and undermined its ability to support zero emission fuels that provide air quality cobenefits to California. Raising the stringency of the standard without addressing the root cause of the recent flood of credits will lead to passthrough costs that rise rapidly for the many California drivers who have not yet been able to transition to zero emission vehicles. This will make the LCFS program regressive and undermine political support for it. High consumer costs will also make the program unattractive in other jurisdictions. Additionally, when California absorbs the lion's share of the lipid feedstocks nationwide it creates an additional barrier to replicating the program in other jurisdictions, since the lipid feedstocks are inelastic and cannot be scaled up to meet demand elsewhere. Limiting California's consumption of these finite and inelastic sources of fuel to a reasonable share of the pool available nationwide will allow CARB to stabilize LCFS credit prices with a more gradual increase in overall stringency, which will limit passthrough costs to California drivers and make the LCFS program replicable in other jurisdictions.

CARB should phase out credits for avoided methane emissions and limit LCFS carbon intensity scores to no less than zero to wind down what has become in effect a poorly run offset program.

CARB maintains that the negative carbon intensity (CI) scores associated with manure methane are based on a lifecycle analysis of fuel pathways and do not constitute an offset program, but this distinction does not stand up to scrutiny. Clearly when a manure lagoon far from California captures methane that might otherwise be released into the atmosphere, the claimed reduction in methane pollution is occurring in the agricultural sector in another state and does not reduce California's transportation emissions or even California's manure methane emissions.

The initial rationale for the lifecycle basis of the LCFS was to hold fuel producers accountable to reduce emissions in their supply chains, especially to hold ethanol producers accountable for fossil fuel use and other emissions in the production of ethanol. Large negative CI scores go beyond this accountability and instead effectively create an extremely lucrative and poorly regulated offset program. The negative CI scores for manure biomethane are entirely a function of the assumption that absent the LCFS, the methane would be vented to the atmosphere. But this central assumption is not validated by a formal requirement for additionality and ignores the growing incentives outside the LCFS supporting digesters and the authority granted to CARB by the legislature to regulate methane emissions from manure lagoons.

It strains common sense to claim that avoided methane emissions from a manure lagoon in another state are in the supply chain of a steam methane reformer running on fossil natural gas in California. This goes beyond holding fuel producers accountable to clean up their own supply chains and instead allows a polluting fossil fuel producer in California to avoid making investment in cleaner technology by purchasing what are in effect offsets from the agricultural sector in another state.

The conventions of lifecycle analysis are not conducive to running an effective offset program, and the result is that negative CI scores are undermining California's transportation fuel policy, raising costs for California transportation fuel consumers, and creating a poorly designed subsidy for manure methane capture nationwide that distorts milk and meat markets in favor of the largest producers without regard for the harm these facilities causes adjacent communities. CARB should wind down this de facto offset

program by rapidly phasing out credit for avoided methane pollution, tightening deliverability requirements and avoid repeating the same mistakes in the nascent low CI hydrogen sector. CARB should also act early to head off related problems that could come from using the LCFS to support direct air capture projects, discussed below.

California cannot meet its climate goals unless it cuts methane emissions from manure lagoons AND phases out combustion of fossil fuels in the transportation sector and fuel supply chains.

Conflating transportation and agricultural pollution as the current treatment in the LCFS does slows down progress towards both. The quantity of biomethane credited in the LCFS is already at or near the quantity of natural gas used for transportation in California, so there is little if any additional demand for methane as a transportation fuel. Steam methane reforming is a polluting technology that is not suitable to produce low carbon hydrogen, and natural gas combustion is a polluting technology that is not the appropriate way to generate electricity to charge electric vehicles. Biomethane is not an important fuel for the future of transportation in California, and the main role of the negative CI biomethane in California transportation policy is to give fossil fuel producers cover to keep using fossil fuels.

There is more work to do to mitigate methane pollution from agriculture, but digesters are not the best or only way to address manure methane emissions, and the LCFS as a transportation fuel regulation is not structured to deliver good outcomes in agricultural pollution mitigation. Other manure methane abatement strategies supported by the Alternative Manure Management Program (AMPP) are not able to participate in the LCFS revenue opportunity because they reduce methane pollution rather than capturing it. This tilts the economic playing field against adoption of these strategies, undermining California's manure methane mitigation. It is not appropriate to ask California drivers to foot the bill for very expensive digesters to mitigate manure methane, especially for manure lagoons in other states. The legislature gave CARB the authority to regulate this pollution, and CARB should get to work implementing these regulations. To the extent that incentives complement regulations in manure methane mitigation, the incentives should at the very least offer parity in support between AMPP methane abatement strategies and digesters, and preferably take into consideration a wholistic view of the environmental and equity implications of different strategies and adjust support to promote the least polluting and most equitable solutions.

Additional Comments on dairy methane economics.

I have recently heard an argument that Aaron Smith's recent post [Are Manure Subsidies Causing Farmers to Milk More Cows?](#)¹ proves that the LCFS does not cause dairies to increase in size. This is misleading. The first mistake is that absence of evidence does not mean evidence of absence. Professor Smith's finding is that "there is no evidence [in the currently available data] that the LCFS has caused growth in dairy cow numbers." Professor Smith's post goes on to explain the limitations of the current data, which may be addressed next year when the 2022 agricultural census is released.

More importantly, the question of whether there is unambiguous evidence that the LCFS has already led to herd size increases is too narrow. Professor Smith's post states the undisputed fact that "Anaerobic digesters are much more cost effective on large farms." Professor Smith's subsequent post on [The Value](#)

¹ Aaron Smith. April 07, 2023. Are Manure Subsidies Causing Farmers to Milk More Cows? <https://asmith.ucdavis.edu/news/are-digesters>

[of Methane from Cow Manure](#)² provides more details. For a 2,500-cow herd, the value of LCFS, RFS credits and gas per cow exceeded \$2,000 per cow per year from 2019 through the first half of 2021, which was over 40% of the value of the milk per cow. In this timeframe the revenue from the digester exceeded the private cost of the digester by more than \$1,000 per cow per year. This is a very large distortionary subsidy relative to the price of milk that is heavily tilted towards the largest facilities because of the inherent returns to scale in pipeline connected digesters.

Because digesters are not economically feasible for smaller dairies, the LCFS subsidy is not available or is greatly reduced for smaller facilities. This makes it harder for smaller facilities to compete in milk markets, which is why there is a well-founded concern that distortionary subsidies for the largest facilities based on poorly policed claims of avoided methane contribute to consolidation. Professor Smith's analysis makes plain that dairies are an extremely expensive and inefficient way to produce methane, and methane is a minor transportation fuel, so allowing transportation fuel policy to influence the economics of milk (or pork) production so heavily is a terrible idea that is likely to drive bad outcomes even if we don't yet have clear evidence that large scale herd size increases have already occurred.

Cap compliance from lipid-based fuels and proactively cap compliance from direct air capture projects to ensure that federal subsidies for some LCFS pathways do not undermine the policy.

The recent surge of credits from renewable diesel, which undermined LCFS credit prices, arose from the interaction of federal support for lipid-based fuels with the LCFS. Without substantial support from RFS and federal tax credits, renewable diesel would be an expensive source of LCFS compliance and would have been used sparingly only once all other compliance options were exhausted. However, with RFS and tax credits, renewable diesel became an inexpensive source of LCFS compliance and flooded the market. I have discussed the need to constrain LCFS compliance from lipid-based fuels extensively in previous comments³, but there are also lessons to learn to avoid repeating the same mistake with respect to other pathways, particularly direct air capture projects (DAC).

The extremely generous recently enacted federal subsidies for DAC combined with other sources of support could lead to large DAC projects being undertaken and credited under the LCFS. These new subsidies could dramatically alter the economics of DAC projects under the LCFS. Without these federal subsidies, DAC would be an expensive last resort to address emissions for fuel pathways where a low carbon alternative fuel is not feasible and create a high marginal price for LCFS credits. With the large federal support, it becomes plausible that LCFS credits from large DAC projects outside of California could flood the California market and undercut LCFS credit prices. If CARB enacts a stringency ratcheting mechanism, the flood of DAC credits could automatically increase program stringency and increase passthrough costs for California consumers. As Jim Duffy highlights in his comments, a single large out of state DAC project could increase LCFS passthrough costs by \$200 million "while providing no jobs for

² Aaron Smith April 14, 2023. The Value of Methane from Cow Manure. <https://asmith.ucdavis.edu/news/digester-update>

³ See my comment from March 15th at <https://www.arb.ca.gov/lists/com-attach/67-lcfs-wkshp-feb23-ws-UyYAZQZ0BAhRNAFu.pdf>

Californians, displacing no fossil fuels in California, resulting in no air pollution benefits to California communities, and not even counting toward California's AB32 emission reduction goals.⁴

I recognize that the scoping plan suggests there may be a need for DAC at some level, which may justify some level of support for DAC through the LCFS. However, California would not be well served if DAC projects that are not economic once federal tax credits expire play a large role in LCFS compliance, driving up pass through costs and displacing more cost effective and durable solutions like electrification. When the federal tax credits expire, California would be left with sharply increased passthrough costs or might find LCFS compliance was no longer feasible within the limits of the credit price ceiling. To ensure the support the LCFS provides for DAC is commensurate with California's needs and does not undermine the LCFS, CARB should proactively cap the amount of LCFS compliance that can be provided by DAC at a small share of LCFS compliance. Capping DAC compliance would allow LCFS to support a few early projects, while also recognizing that DAC is a last resort to offset emissions where transportation electrification is not feasible rather than a substitute for phasing out petroleum. The level of the cap could be reconsidered once projects have begun operating and we have a better understanding of the costs and benefits of the technology. This would allow CARB to make a more informed decision about how large a role this technology should ultimately play in overall LCFS compliance. A lesson learned from the current challenges with renewable diesel and manure biomethane is that can be challenging to impose new policy constraints after projects are underway and there is a risk of stranded assets, so it is prudent to start with a modest cap and loosen it later as circumstances warrant.

LCFS credit for DAC projects raise the same concern as manure biomethane about a de facto offset program operating within the LCFS program without limits and additionality requirements. CARB should reconsider whether the LCFS is the appropriate policy mechanism to enact this kind of de facto offset program, and if it moves forward, it should ensure that any offsets allowed in the LCFS are technically sound, additional, distributionally fair, at an appropriate scale and do not create harmful unintended consequences.

Redirect credit value from electrification to support equity and ensure the LCFS does not become an unfair and regressive burden on low-income drivers of older internal combustion vehicles.

As California transitions more of its fleet to zero emission vehicles and LCFS stringency rises beyond 20 percent CI reduction, the LCFS could become a regressive burden on low-income drivers if they are not able to transition to EVs. To proactively prevent this problem CARB should redirect the support LCFS credits generate for transportation electrification to support low income and overburdened populations. One immediate opportunity is to reconsider the Clean Fuel Rewards program. Jim Duffy's suggestion in his recent comment to replace or refocus the Clean Fuel Rewards program on helping low-income drivers transition to EVs make sense and is worth careful consideration. A new [report from UCS and The Greenlining Institute](#)⁵ suggests prioritizing EV incentives to populations owning older cars. Similar measures may also be appropriate now or in the future to ensure the distributional impact of LCFS support for medium and heavy-duty electric vehicles supports California's policy goals and is equitable.

⁴ See Jim Duffy's May 28th comments.

⁵ Cleaner Cars, Cleaner Air: Replacing California's Oldest and Dirtiest Cars Will Save Money and Lives. www.ucsusa.org/resources/cleaner-cars-cleaner-air www.greenlining.org/publications/cleaner-cars-cleaner-air.

In general, once the total cost of ownership of a zero-emission vehicle is equal or lower than its internal combustion alternative, CARB should consider mechanisms to direct LCFS support towards those populations or market segments that face a higher economic barrier or where an EV would offer greater air quality or environmental justice cobenefits.

Credits for CCS should exclude enhanced oil recovery and all project-based crediting for CCS should be paused.

The LCFS amendment process should bring the LCFS into alignment with the scoping plan and with legislation enacted since the last set of amendments. The legislature has clearly indicated through SB 1314 and SB 905 that CARB should not support or recognize emissions reductions associated with carbon dioxide captured for use in enhanced oil recovery (CCS-EOR). Expanded federal support for CCS-EOR is already more than adequate to cover its costs, and adding LCFS compliance value on top of the tax credit will effectively subsidize oil-extraction at the expense of California drivers. CARB should exclude this use of sequestered carbon from credit generation within the LCFS whether it occurs within California's borders or outside.

Additionally, SB 905 instructed CARB to develop a CCS program with protections for environmental justice communities. CARB should conclude the SB 905 rulemaking process prior to approving any new LCFS projects or pathways involving CCS to ensure these are consistent with the SB 905 program and do not undermine the protections required by this legislation.

The LCFS should not support SMR Hydrogen in Refinery Communities

The scoping plan anticipates a substantial role for hydrogen in California's future. When produced cleanly and safely and used in strategic, climate-aligned applications, hydrogen can play a secondary but still significant role in helping the state meet its economy-wide climate goals. However, many recent LCFS pathways rely on the use of highly polluting steam methane reforming (SMR) operations, which can increase air pollution burdens in already overburdened communities. LCFS credits for any hydrogen projects in refinery communities or otherwise overburdened communities should not be approved prior to a thorough public engagement process, assessment of the cumulative environmental burden they impose on adjacent communities, and development of pollution mitigation and community benefits agreements.