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Per email: [LCFSWorkshop@arb.ca.gov](mailto:LCFSWorkshop@arb.ca.gov)

Cc: Steve Cliff, CARB Executive Officer and CDFA Secretary Karen Ross

These comments are in response to the November 9, 2022 Low Carbon Fuel Standard Workshop in which a number of new policy options were presented. Our comments are limited to the discussion of dairy gas and its place in the LCFS program.

We thank you for formally and publicly including in the LCFS discussion, a *limited role* for biomethane (dairy gas) as noted in the Scoping Plan: “Biomethane currently displaces fossil fuels in transportation and will largely be needed for hard-to-decarbonize sectors but will likely continue to play a targeted role in some fleets while the transportation sector transitions to ZEVs.” We also appreciate the new overall scoping plan standard of at least an 85 percent reduction in anthropogenic greenhouse gases by 2045. Our comments speak to these goals.

The workshop presented two options with regard to biomethane: 1) No new fuel pathways would be certified with avoided methane after 2030, and existing avoided methane pathways would be phased out by 2040; and 2) Use of renewable natural gas (RNG) as a transportation fuel would be limited to projects in the Western natural gas network. We believe that neither of these options adequately addresses the pressing current dilemma created by the valuable credits assigned to biomethane from anaerobic digesters by the current LCFS program. Other options are available, which better fit the situation outlined by the most recent IPCC AR6 report.[[1]](#footnote-1)

Moral hazard and other problems with avoided methane certification under LCFS

* CAFOs are a cause of significant health problems and pollution of water and air, especially in the central valley. The LCFS negative carbon intensity ratings for captured manure methane are providing very large resources to CAFOs not only in California but in other parts of the country. Farms with large herds can earn more from selling their manure byproduct than from selling milk. This fact means the LCFS is incentivizing larger herd sizes (which can actually increase the overall emissions from a farm with a digester) and is locking into place the CAFO dairy organization. Digesters used to produce electricity are also a direct cause of air pollution (N0x) due to their reliance on combusting biogas. These same considerations, or worse, are likely to apply to producers in other states who use the biomethane LCFS program.
* Avoided emissions credits distort the low carbon fuel standard program itself as purchasers of the methane reduction credits are rewarding polluters that should be controlled by regulation, as other SLCPs are. (We don’t pay owners of leaking abandoned wells to capture the methane; we fine them if they don’t eliminate it. Similarly, CARB requires diesel truck owners to install equipment to reduce or eliminate black soot.)
* The anticipated 2030 deadline is certain to set off a “gold rush” as dairies move to install digesters and collect the massive subsidies available through the avoided emissions credits.
* Digesters that upgrade biogas to biomethane and send it through natural gas pipelines contribute to public utilities’ and related industries’ resistance to phasing out natural gas.
* Even though the scoping plan says that by 2045 biomethane should be limited to hard to decarbonize industries, there is no plan for how to implement that limitation.[[2]](#footnote-2) How do we get from biomethane as a means of reducing the impact of fossil fuels to limiting its use to cement and steel and similar industries as needed? Biomethane should not be incentivized now without this path being clear.

## RECOMMENDATIONS

A wide range of policy makers and industry leaders in other states will take their cue from what California does about dairy gas. California’s policies should lead to resolution of the numerous environmental and social justice problems caused by CAFOs in the Central Valley and remediate CARB’s apparent lack of planning to divert biomethane for use only in hard to decarbonize industries.

The simplest and most effective way of dealing with the many negative effects of avoided emissions credits is to eliminate them. Stop them now or in 2025[[3]](#footnote-3) instead of in 2030. The policy alternatives below are all more complicated, less certain, and less clearly within the authority of the LCFS program.

Environmental justice advocates petitioned CARB a year ago to end avoided emissions credits;[[4]](#footnote-4) and CARB responded that alternatives would be provided in the scoping plan. In the event neither the final scoping plan nor the final report on reducing agricultural methane, nor this proposed LCFS alternative actually address the issues of the petition, CARB could choose to approve the petition.

If avoided emissions are not eliminated, there are several other policies the LCFS could adopt that are intended to address perverse incentives for natural gas utilities and for dairies.

1. The “credit aggregator” suggested to CARB by Jeremy Martin of the Union of Concerned Scientists.[[5]](#footnote-5) CARB could “appoint a credit aggregator to monetize avoided methane credits and distribute the funds in support of agricultural methane emissions reductions in a manner that supports best practices, avoids distorting the dairy market, and is complimentary with other state policies and consistent with other state goals, including minimizing co-pollutants and promoting environmental justice.” We are agnostic as to whether the LCFS could do this without enabling legislation, but we would like to see this implemented if avoided emissions are not terminated in the near future.
2. A second alternative is coproduct allocation. “Manure is, at present, considered to be a waste product. Therefore, none of the emissions from milk production are allocated to manure or manure-based bioelectricity production. However, …a significant fraction of the revenue of a dairy farm with anaerobic digesters and a significant fraction of the profit from medium-to-large dairies with anaerobic digesters could come from manure that has been concentrated into anaerobic lagoons such that methane is created. The principles of lifecycle assessment suggest that some of the emissions associated with raising dairy cattle should therefore be attributed to this “valuable” coproduct.[[6]](#footnote-6) We believe the LCFS could itself change the standards for its life cycle assessment so as to assign the value of avoided emissions to co-production.
3. LCFS could change the boundaries of the LCA used in evaluating the avoided emissions. As we and others have pointed out, digesters may capture most of the methane produced in a manure lagoon but increase emissions in other ways. If herd sizes increase, then enteric emissions increase. And the digestate is critical and can increase nitrous oxide emissions. Also different farms may have very different approaches to other sources of methane, in their manure management practices, for example. A more accurate way to calculate avoided emissions is by looking at the whole farm reductions (if any) associated with the digester. A somewhat alarming study tracked whole farm emissions on two farms for five years, from right before installation of a digester. Emissions actually increased over the five years.[[7]](#footnote-7) And a 2022 study concluded that methane emissions along biogas and biomethane supply chains are substantially underestimated, with emissions at feedstock, biogas production, upgrading, and digestate handling. Findings led the authors to conclude “a better understanding of the counterfactual life cycle emissions for waste and by-product biomethane feedstocks must be developed.”[[8]](#footnote-8)
4. In 2024 CARB will be allowed by statute (SB 1383) to regulate agricultural methane, and so could change the counterfactual of “avoided emissions” from dairy gas. LCFS assumes that all the methane captured in digesters is “waste” and that dairy methane would be released to the atmosphere if not processed by digesters—hence the “avoided emissions” argument. If regulations, similar to those about to be implemented in New Zealand,[[9]](#footnote-9) required fees on emissions, the counterfactual would change as methane would not be waste but regulated emissions. “If, for example, more stringent policies were to require all confined animal feeding operations to manage manure in enclosed anaerobic digesters, this assumption about the counterfactual would no longer hold true.”[[10]](#footnote-10) Even a simple requirement that methane in lagoons be captured and flared would change this counterfactual.[[11]](#footnote-11)
5. A fourth policy, inadequate in itself but of some value, would be to set standards for herd sizes in farms receiving the LCFS credits. The goal would be to ensure herd sizes do not increase during the period the LCFS credits for avoided emissions were being received.
6. A final option would be for the LCFS to establish a moratorium on avoided emissions credits until actions by other agencies or branches of CARB have addressed the problems of CAFOs and offering false support to natural gas infrastructure. CARB must also make a plan for moving from 2022 to the desired state of using biomethane only for hard to decarbonize industries in 2045.

The moratorium should also apply to book and claim for RNG used as transportation fuel. If reinstated after the moratorium, it should include conditions that other states using Book and Claim deal with the associated problems in ways similar to California. It is unconscionable that we are incentivizing a greater concentration of hogs in North Carolina in order to produce biomethane to sell in California under the pretext that the manure would have existed without the LCFS incentives. Our solutions need to take into account environmental justice in the central valley of California as well as any other states where farms claim biomethane credits.

## Context: The IPCC Goal not to Exceed 1.5°C Warming and the California Dairy Industry

We have been discussing LCFS policies, but they occur in two contexts that must be the basic framework for LCFS decisions. The first is the world’s commitment to limiting warming to 1.5°C, and the second is the overall position of the dairy industry in relationship to the this goal.

Keeping warming to 1.5°C is critical because it is the highest temperature consistent with averting multiple global tipping points.[[12]](#footnote-12) The primary concern is that the IPCC says we will not be able to keep warming to 1.5°C if we don’t cut emissions by about 50% in the next 8-10 years.[[13]](#footnote-13)

Rapid reduction of methane has the potential to slow the rate of warming. The dairy industry is contributing about 45% of California methane, with 25% from manure management practices. Dairy methane in California is attributable to a very large increase in overall herd size, and concentration of small farms into large occurring from the 80s through 2008.[[14]](#footnote-14) Even if there is a 40% reduction of methane as called for in SB 1383 the cumulative emissions in the atmosphere from this build-up will, in 2040, still be on the order of 600 million metric tons of CO2e, a cause of significant warming since 1990.[[15]](#footnote-15) The dairy industry seems to have set a goal of no increased warming, called “climate neutrality” [[16]](#footnote-16) rather than recognizing the need to decrease methane much more substantially. The goal is designed to sustain the current organization of most dairies as concentrated animal feeding operations (CAFOs), which is what has resulted in the large amounts of dairy manure either releasing methane or converting it to biogas/biomethane. The goal is also based primarily in methane reduction, not reducing nitrous oxide or the greenhouse gases attributable to the feed consumed by dairy cows in concentrated operations.

Dairy digesters cannot be the foundation of CARB’s policy for reducing agricultural methane. That will lie in alternative manure management and in further enteric methane reduction research. Ultimately, though part of the solution must be decreasing herd size – which the current LCFS incentives make very difficult. CARB should consider incentivizing these reductions. For example, incentives could go to increasing fallowing of land in the central valley in ways that allow air and water pollution to be addressed under the Sustainable Groundwater Management Act (SGMA) or the Multibenefit Land Repurposing Program (MLRP). Although SB 1383 requires minimizing “leakage” of farms that leave California and take their farms and intact emissions to other state, there are two good reasons that this policy should be reconsidered. First, as noted above, the primary usefulness of California regulations is as a guide for other states. If California regulates herd sizes, it will make a statement that it is not acceptable to organize an industry so that it produces massive amounts of a wholly preventable waste product that is 85 times more warming than CO2 and which the industry treats as an externality.[[17]](#footnote-17) The second reason that “leakage” would not be negative is that only if herd sizes are reduced would the deleterious effects on air and water quality and health of CAFOs become manageable in the central valley.

## Conclusion

We are hopeful that you will end avoided emissions from dairy gas. If you don’t feel that is possible yet, please take the time to explore each of the other options we have suggested. Digesters are *part* of the solution if the problems in the current situation, particularly the avoided emission bonus, can be resolved. Unfortunately both the current policy and the proposal from the workshop do not address the real issues, and the workshop proposal will in all likelihood make the problems digesters are embedded in much worse.

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| Daniel Chandler, Ph.D  350 Humboldt | Janet Cox,  Interim Director  Climate Action California | Gregg J. Gold, Ph.D.  Redwood Chapter Sierra Club  North Group Chair |

1. J. Rogelj et al., “Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development,” In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte et al. (eds.), Cambridge University Press, Cambridge, UK and New York, NY, USA, 2018, pp. 93-174, doi:[10.1017/9781009157940.004](https://doi.org/10.1017/9781009157940.004). [↑](#footnote-ref-1)
2. Analysts are beginning to focus on this transition process, which is not likely to go smoothly. It is important to actually plan the transition. Grubert, Emily, and Sara Hastings‐Simon. "Designing the mid‐transition: A review of medium‐term challenges for coordinated decarbonization in the United States." *Wiley Interdisciplinary Reviews: Climate Change* (2022): e768. [↑](#footnote-ref-2)
3. The reason for waiting for 2025 is to see what form CARB regulations of agricultural methane take. They might, as noted later, affect the judgment that dairy gas is “waste.” [↑](#footnote-ref-3)
4. Petition for Rulemaking to Exclude All Fuels Derived from Biomethane from Dairy and Swine Manure from the Low Carbon Fuel Standard Program. <https://ww2.arb.ca.gov/sites/default/files/2022-01/2021.10.27%20Petition%20for%20Rulemaking%20AIR%20et%20al_.pdf> [↑](#footnote-ref-4)
5. https://www.arb.ca.gov/lists/com-attach/19-dairywkshp220329-ws-VCFXMlQmWVVWNFQ1.pdf [↑](#footnote-ref-5)
6. Younes and Fingerman, op cit. [↑](#footnote-ref-6)
7. Debruyn, Z, VanderZaag, A, Wagner-Riddle, C. Increased dairy farm methane concentrations linked to anaerobic digester in a five-year study. *J. Environ. Qual.* 2020; 49: 509– 515. <https://doi.org/10.1002/jeq2.20052>. [↑](#footnote-ref-7)
8. Bakkaloglu, Semra, Jasmin Cooper, and Adam Hawkes. "Methane emissions along biomethane and biogas supply chains are underestimated." *One Earth* 5, no. 6 (2022): 724-736. [↑](#footnote-ref-8)
9. https://www.theguardian.com/world/2022/nov/12/19-years-after-the-fart-tax-new-zealands-farmers-are-fighting-emissions [↑](#footnote-ref-9)
10. National Academies of Sciences, Engineering, and Medicine, "Current Methods for Life Cycle Analyses of Low-Carbon Transportation Fuels in the United States," 2022. <https://nap.nationalacademies.org/download/26402> [↑](#footnote-ref-10)
11. In practice, this would not be a good policy option because of the relatively high amount of methane not combusted during the flaring process and the many other pollutants released. But it clearly illustrates the issue. [↑](#footnote-ref-11)
12. “Current global warming of ~1.1°C above pre-industrial already lies within the lower end of five Climate Tipping Point (CTP) uncertainty ranges. Six CTPs become likely (with a further four possible) within the Paris Agreement range of 1.5 to <2°C warming, including collapse of the Greenland and West Antarctic ice sheets, die-off of low-latitude coral reefs, and widespread abrupt permafrost thaw.” Science. 9/02/22 <https://www.science.org/doi/10.1126/science.abn7950> [↑](#footnote-ref-12)
13. The amount of carbon we can still emit before passing 1.5°C is established by the IPCC at 500 GtCO2, with a 50% likelihood of achieving that goal. If we want a 67% likelihood, the carbon budget must decrease to 400 GtCO2. “Global CO2 emissions are about 36 billion tonnes per year, so 400 billion tonnes will last just 11 years if no reductions are made, i.e. the global carbon budget runs out at the end of 2030.”Summary of IPCC AR6 at: <https://www.carbonindependent.org/54.html>. [↑](#footnote-ref-13)
14. Liu, Shule, Joe Proudman, and Frank M. Mitloehner. "Rethinking methane from animal agriculture." *CABI Agriculture and Bioscience* 2, no. 1 (2021): 1-13. <https://link.springer.com/article/10.1186/s43170-021-00041-y> The approach uses GWP\* an innovative but not widely accepted alternative to the IPCC’s 100 year and 20 year GWP approach. [↑](#footnote-ref-14)
15. Ibid. Figure 5. [↑](#footnote-ref-15)
16. See the video called Achieving Climate Neutrality at https://www.youtube.com/playlist?list=PLJEeYejb4pU\_Ay3h57j-jCr7yVZTWJWXE [↑](#footnote-ref-16)
17. The EPA’s new draft standard for the social cost of carbon (and other greenhouse gases) puts the cost of a ton of emitted methane at $1,600. See the discussion at: https://www.resources.org/common-resources/the-us-environmental-protection-agency-introduces-a-new-social-cost-of-carbon-for-public-comment/ [↑](#footnote-ref-17)