
February 20, 2024

Re: Proposed Low Carbon Fuel Standard Amendments

Disclaimer: The opinions expressed herein are our own and do not necessarily reflect the views of The Johns Hopkins University.

Liane M. Randolph
Chair, California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Chair Randolph:

We are researchers at the Johns Hopkins Center for a Livable Future (CLF) based at the Bloomberg School of Public Health in the Department of Environmental Health and Engineering. The Center for a Livable Future investigates the interconnections among diet, food production, public health, and the environment. Since 1996, the Johns Hopkins Center for a Livable Future has applied a public health lens to the ecological, economic, and social considerations across the food system. While the Low Carbon Fuel Standard (LCFS) has potential to support environmental justice and a transition to renewable fuel sources in California's transportation sector, we are concerned that a specific element of the Proposed LCFS Amendments will negatively impact the health of Californians and Americans alike. Specifically, we believe that the inclusion of the avoided methane credits in the Proposed LCFS Amendments would threaten public health and deepen environmental injustices by incentivizing and further entrenching the industrial food animal production (IFAP) model.

We call on the California Air Resources Board (CARB) to eliminate avoided methane crediting, as recommended by its own Environmental Justice Advisory Committee (EJAC) ([CARB 2023](#)).

The avoided methane credits incentivize growth of and further entrench the industrialized model of food animal production, which has been demonstrated to threaten public health.

IFAP is a term referring to the predominant system of meat, milk, and egg production in the U.S., characterized by confining thousands of animals in small areas and the resulting concentration of massive quantities of manure. The Environmental Protection Agency (EPA) and Centers for Disease Control (CDC) have documented that these large animal operations pose significant public health and environmental risks, particularly in surrounding communities ([US EPA 2013](#); [CDC 2018](#)). These facilities are disproportionately sited in low-income communities, as well as in non-white communities ([US EPA 2013](#); [CDC 2018](#)). Public health concerns stem from human exposures to air pollution, as well as drinking water and soil contamination. EPA recently analyzed the literature documenting health effects of direct emissions from animal production facilities and found that residential proximity to them is linked to asthma, decreased lung function, mortality, odor annoyance, and gastrointestinal illness ([US EPA 2023](#)).

The Proposed LCFS Amendments state that digester operators that join the program before 2030 can receive payment for the avoided methane credits until 2060, creating an enormous incentive for biodigester expansion in the next six years. Further, evidence suggests that the economic viability of these operations requires a significant number of animals ([Anderson et al. 2013](#), [Barbera et al. 2019](#); [US EPA 2023](#)). Given public health concerns related to the operation of these IFAP facilities, such an expansion may have implications for human exposures to IFAP related pollutants.

We are concerned that the avoided methane credits incentivize wet manure management systems, which pose known public health concerns. These systems use pits or tanks to store liquid waste and a connected system of pipes to transport it. The tanks and pipes are both susceptible to failures and breaches—now more common as heavy rainfall and flooding become more frequent and intense due to climate change. These failures and breaches may release pathogens, nitrates, and other pollutants into surface water and groundwater supplies ([Burkholder et al. 2007](#)). Exposure to these contaminants have been linked to an increased risk of cancer, diabetes, thyroid disease, and birth defects ([Burkholder et al. 2007](#); [Jones et al. 2016](#); [Inoue-Choi et al. 2015](#); [Temkin et al. 2019](#)). Furthermore, wet manure management systems are associated with high levels of nitrous oxide and methane emissions, which contribute to climate change and are associated with increased asthma attacks ([Glibert 2020](#)).

Due to the water contamination and air pollution caused by wet manure management systems, the American Public Health Association (APHA) has called on federal and state governments to “prohibit the installation of new liquid manure handling systems, including waste lagoons” and to phase out existing wet manure management at IFAP facilities ([APHA 2019](#)). Unfortunately, the Proposed LCFS Amendments, through avoided methane crediting and the resulting negative carbon intensity for biogas, would do the opposite.

The avoided methane credits do not reduce burdens on environmental justice communities and workers.

The avoided methane credits run counter to one of the key intentions of the Proposed LCFS Amendments which is to promote investment and improve air quality in disadvantaged communities ([CARB 2023](#)). In a study of North Carolina counties with many IFAP operations, average ammonia concentrations, linked to the health effects listed above, have been found to be two and a half to three times higher in environmental justice communities compared to the entire study region ([Quist et al. 2022](#)). Additionally, IFAP operations are associated with declining infrastructure, property values, and sense of cohesion—all of which have the opposite impact of community investment ([Donham et al. 2007](#)).

The EJAC, whose membership comes from Many disadvantaged communities with significant exposure to air pollution, concluded that IFAP facilities do not promote investment or improved air quality in disadvantaged communities ([EJAC 2023](#)). CARB must honor the recommendations of EJAC in order to follow through with its own commitments to reducing pollution burdens in environmental justice communities.

The practice of burning biogas on-site for electricity production poses safety and public health risks to workers. These can include explosions, asphyxiation, and disease from bacteria, viruses, and parasites in manure ([Westenbroek and Martin II 2019](#)). Many agriculture workers are not protected by US labor laws ([Lydersen 2022](#)); California has the opportunity to protect those workers from these risks by prohibiting the burning of biogas in its LCFS regulations.

In conclusion, the California Air and Resources Board must eliminate avoided methane crediting, included in the Environmental Justice Scenario, in order to mitigate the public health risks described above. CARB has stated its commitment to transition to clean fuels and to improve air quality in the transportation sector in California. We believe that a solution to improved air quality in the transportation sector cannot include regulations that harm air quality in the agricultural sector. Given that CARB does not have the authority to implement air quality mitigation measures, it should be particularly cautious about including any measures in the LCFS that pose a public health risk to air quality.

Sincerely,

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References

- Anderson, Robert C., Don Hilborn, and Alfons Weersink. "An Economic and Functional Tool for Assessing the Financial Feasibility of Farm-Based Anaerobic Digesters." *Renewable Energy* 51 (March 1, 2013): 85–92. <https://doi.org/10.1016/j.renene.2012.08.081>.
- APHA. 2019. "Precautionary Moratorium on New and Expanding Concentrated Animal Feeding Operations." American Public Health Association. November 5, 2019.
- Barbera, Elena, Silvia Menegon, Donatella Banzato, Chiara D'Alpaos, and Alberto Bertucco. 2019. "From Biogas to Biomethane: A Process Simulation-Based Techno-Economic Comparison of Different Upgrading Technologies in the Italian Context." *Renewable Energy* 135 (C): 663–73.
- Burkholder, JoAnn, Bob Libra, Peter Weyer, Susan Heathcote, Dana Kolpin, Peter S. Thorne, and Michael Wichman. 2007. "Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality." *Environmental Health Perspectives* 115 (2): 308–12. <https://doi.org/10.1289/ehp.8839>.
- CARB. 2023. "Staff Report: Initial Statement of Reasons." Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard. Sacramento, CA: California Air Resources Board.

CDC. 2018. "Animal Feeding Operations." Centers for Disease Control and Prevention. October 26, 2018.

Donham, Kelley J., Steven Wing, David Osterberg, Jan L. Flora, Carol Hodne, Kendall M. Thu, and Peter S. Thorne. 2007. "Community Health and Socioeconomic Issues Surrounding Concentrated Animal Feeding Operations." *Environmental Health Perspectives* 115 (2): 317–20. <https://doi.org/10.1289/ehp.8836>.

EJAC. 2023. "Assembly Bill 32 Environmental Justice Advisory Committee (EJAC) DRAFT Recommendations to the California Air Resources Board (CARB) on the Low Carbon Fuel Standard Regulation Updates."

Glibert, Patricia M. 2020. "From Hogs to HABs: Impacts of Industrial Farming in the US on Nitrogen and Phosphorus and Greenhouse Gas Pollution." *Biogeochemistry* 150 (2): 139–80. <https://doi.org/10.1007/s10533-020-00691-6>.

Inoue-Choi, Maki, Rena R. Jones, Kristin E. Anderson, Kenneth P. Cantor, James R. Cerhan, Stuart Krasner, Kim Robien, Peter J. Weyer, and Mary H. Ward. 2015. "Nitrate and Nitrite Ingestion and Risk of Ovarian Cancer among Postmenopausal Women in Iowa." *International Journal of Cancer* 137 (1): 173–82. <https://doi.org/10.1002/ijc.29365>.

Jones, Rena R., Peter J. Weyer, Curt T. DellaValle, Maki Inoue-Choi, Kristin E. Anderson, Kenneth P. Cantor, Stuart Krasner, et al. 2016. "Nitrate from Drinking Water and Diet and Bladder Cancer Among Postmenopausal Women in Iowa." *Environmental Health Perspectives* 124 (11): 1751–58. <https://doi.org/10.1289/EHP191>.

Lydersen, Kari. "Biogas Expansion May Compound Worker Risks." *Energy News Network*, November 16, 2022.

Quist, Arbor J.L., Jill E. Johnson, and Mike Dolan Fliss. 2022. "Disparities of Industrial Animal Operations in California, Iowa, and North Carolina." *Earthjustice*.

Temkin, Alexis, Sydney Evans, Tatiana Manidis, Chris Campbell, and Olga V. Naidenko. 2019. "Exposure-Based Assessment and Economic Valuation of Adverse Birth Outcomes and Cancer Risk Due to Nitrate in United States Drinking Water." *Environmental Research* 176 (September): 108442. <https://doi.org/10.1016/j.envres.2019.04.009>.

US EPA. 2013. "Literature Review of Contaminants in Livestock and Poultry Manure and Implications for Water Quality." 4304T EPA 820-R-13_002. Office of Water. United States Environmental Protection Agency.

US EPA. 2023. "Technical Background Document for EPCRA Animal Waste ANPRM." Washington, DC: U.S. Environmental Protection Agency.

Westenbroek, Patricia A., and Jerry Martin II. 2019. "Anaerobic Digesters and Biogas Safety – Farm Energy." *Farm Energy*. April 2, 2019.