UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

POLICY INSTITUTE FOR ENERGY, ENVIRONMENT, AND THE ECONOMY

14 June, 2023

State of California, Air Resources Board

Regarding: Community meeting

Dear Low Carbon Fuel Standard team:

Thank you for the opportunity to comment on the ideas and materials related to the Low Carbon Fuel Standard (LCFS) in California presented in this workshop. The University of California, Davis Institute of Transportation Studies, along with the Policy Institute for Energy, Environment, and the Economy has been engaged in research, policy analysis, and technical assistance relating to alternative fuel policy for well over a decade. We commend Staff for facilitating this opportunity to seek community feedback, especially on complex topics like those discussed at the workshops. We appreciated the opportunity to hear concerns from Central Valley residents, as well as business owners about the proposed changes to the program; this helps us better align our models and research agenda with real-world challenges in this space.

At the workshops, I made a comment mentioning two studies on air quality impacts of Low Carbon Fuel Standards, as well as other clean energy goals. I provide links to the primary material here so they can be considered as CARB Staff and community stakeholders consider potential changes to the LCFS.

Modeling Air Quality Impacts of Proposed Changes to Oregon's Clean Fuels Program

This project estimated the emissions impact of changes to Oregon's transportation system consistent with two potential targets for their Clean Fuels Program (which is very similar to California's LCFS). These changes in emissions were then run through atmospheric chemistry and transport simulations to predict likely changes in air quality in 2035, as well as the expected health impacts. The proposed changes resulted in approximately 5 fewer annual deaths per million population from air pollution, specifically particulate matter in 2035, primarily from the displacement of conventional vehicles by zero-emission ones. In addition to broad improvements in air quality, the projections indicated reductions in the air pollutant exposure disparities along both racial and income-based lines.

Peer-reviewed article: Li, Yiting, Guihua Wang, Colin Murphy, and Michael J. Kleeman. "Modeling Expected Air Quality Impacts of Oregon's Proposed Expanded Clean Fuels Program." *Atmospheric Environment*, January 3, 2023, 119582. https://doi.org/10.1016/j.atmosenv.2023.119582.

Project Webpage, including technical report, policy brief, and slide deck from presentation: https://policyinstitute.ucdavis.edu/events/air-quality-impacts-proposed-expansion-oregons-clean-fuels-program

Related Article: Air Quality Impacts from Clean Energy and Fuels in California

This paper used similar modeling methodology as those in the Oregon analysis above, but in this case, it evaluated air quality impacts in California from the adoption of a broad portfolio of clean energy and fuel sources, displacing fossil fueled ones. This portfolio was not tied to any specific policy, but was generally reflective of progress toward deep decarbonization of California's economy. It projected broad air quality gains from this transition, along with a narrowing of disparities in air pollutant exposure along racial and income based lines.

Peer-reviewed article: Li, Yin, Christopher Yang, Yiting Li, Anikender Kumar, and Michael J. Kleeman. "Future Emissions of Particles and Gases That Cause Regional Air Pollution in California under Different Greenhouse Gas Mitigation Strategies." *Atmospheric Environment* 273 (March 15, 2022): 118960. https://doi.org/10.1016/j.atmosenv.2022.118960.

Related Report: Benchmarking Alternative Manure Management Program Impacts on Dairy Emissions and Long-Term Airshed Impacts

This report provides results of a CARB-sponsored research project by UC Davis researchers. It discusses measurements of air pollutant emissions from dairies that adopted a variety of alternative manure management approaches, as well as modeling of air quality impacts in the San Joaquin Valley under scenarios that assume broad adoption of various approaches to methane management. The research found little effect from the alternative manure management approaches, though suggested that this may be due to measurement problems and other confounding factors. It also modeled scenarios in which digesters were widely adopted at dairies in the San Joaquin Valley and found minimal impact to regional air quality from any of the modeled scenarios. It is important to note that local air pollution impacts can be significant even if regional (Valley-wide) ones are not.

CARB Technical Report (Mitloehner and Kleeman 2021):
https://ww2.arb.ca.gov/sites/default/files/2022-05/CARB%2017RD017%20Final%20Report%20ADA.pdf

Finally, we wanted to highlight a project that we are hoping to begin this Fall. Workshops like those held on May 31 and June 1 have clearly demonstrated the need for more effective cooperation between front-line communities and policy makers as complex policies like the LCFS are developed. We have submitted proposals to two state-funded research programs, the California Climate Action Initiative and the Resilient and Innovative Mobility Initiative, to support

work over the coming year to help build better capacity for cooperative policy development. Our plan would be to recruit 4-5 members of front-line community groups and other equity and environmental justice organizations to participate in regular workshops over a period of several months (funding will be available to help compensate participants and/or the groups they work with for their time commitment to this project). At first, these workshops would be informational, where researchers from the UC Davis Institute of Transportation Studies provide a deep look at the research and modeling tools used in fuel and energy systems analysis, while community group members present material related to local impacts of fuel and energy projects to the researchers. The second half of the program would be to cooperatively develop new policy designs for the LCFS, as well as new modeling tools needed to understand the potential or likely impact of these designs. The goal is to help enhance community group capacity to use and evaluate the modeling tools that support decision making around the LCFS, while enhancing UC Davis researchers' ability to engage with issues of critical importance to front-line communities.

We are hopeful that one or both of the applications for funding will be accepted, and we can begin recruiting participants in the Fall of 2023, for work that will predominantly occur in early-mid 2024. Any members of the community that are interested in participating, or have questions or suggestions are encouraged to reach out to the email address below.

We appreciate the opportunity to participate in this discussion and provide resources that can help facilitate a healthy and informed discussion. If there is anything we can add or clarify, please do not hesitate to contact me at cwmurphy@ucdavis.edu.

Signed,

Colin Murphy, Ph.D.
Deputy Director, Policy Institute for Energy, Environment, and the Economy
Co-Director, Low Carbon Fuel Policy Research Initiative
University of California, Davis, California, USA