California Air Resources Board

1001 I St #2828

Sacramento, CA 95814

December 9, 2019

Re: Advanced Clean Trucks Regulation

To the California Air Resources Board:

Thank you for considering the “Advanced Clean Trucks Regulation”, which is a first step towards increasing electric trucks in California while improving the health of Californians. As a researcher and doctoral student at the George Washington University Milken Institute School of Public Health, my research focuses on quantifying the health impacts of air pollution. Air pollution is known to adversely affect human health, with between 58,600 and 120,000 deaths attributed to fine particulate matter (PM2.5) in the United States[[1]](#footnote-1),[[2]](#footnote-2). We are now able to estimate the health impacts of air pollution at the city level, and my current work aims to quantifying the health burden of air pollution in the Bay area, with a focus on the environmental justice neighborhoods of West and Downtown Oakland.

Our initial estimates show that an average of 1-5% of all deaths in the Bay area may be attributable to nitrogen dioxide (NO2) exposure and an average 2-4% for exposure to PM2.5. In areas of high pollutant concentrations, particularly near large roadways in the Bay area, this can range from 5-10% for NO2 and 4-22% of all deaths for PM2.5. Previous work by our group has demonstrated the large health impact of NO2 on the development of pediatric asthma[[3]](#footnote-3). Pediatric asthma is higher in the city of Oakland as compared to other areas of California[[4]](#footnote-4), and our initial estimates estimate that an average of 17-46% of the cases within Oakland may be attributable to NO2 exposure.

These health impacts are unnecessary, preventable, and avoidable. Our initial results show that 37% of PM2.5-attributable deaths and 36% of new PM2.5-attributable asthma cases could be avoided if concentrations in the Bay area are reduced to average concentrations, and with an additional 95% of PM2.5-attributable deaths and 95% of attributable asthma cases avoided if concentrations were to be reduced to minimum concentrations. Although we present the results for PM2.5 and NO2 separately, the estimates for both pollutants may overlap, as a result of our use of single-pollutant epidemiologically-derived concentration response functions. The benefits to the health of Californians are likely much larger than what we have estimated here, as these estimates are only for the Bay area, though the truck electrification rule would have benefits in areas that are known to have even higher levels of air pollution, such as the Los Angeles area

Reviewing health burden estimates in the Standardized Regulatory Impact Assessment (SRIA), it is possible that the SRIA does not fully quantify the health impacts of air pollution. In its health impact function, CARB utilized CDC Wonder County-level baseline incidence rates. Our work has found that use of highly resolved baseline disease rates, such as census block group (CBG) baseline disease rates, generates estimates approximately 22% higher than when using county level disease rates. Additional analyses for this regulation, and future air pollution control regulations, could make use of interagency data to better assess the potential health impacts of CARB regulations.

Truck electrification is an important step to reducing the health impacts of air pollution, particularly among vulnerable communities residing near areas of heavy truck traffic, such as Oakland, California. The health burden of air pollution is a current problem for California, and action must be taken sooner rather than delaying the benefits of truck electrification. Further, the rule does not go far enough to increase the number of electric trucks required in California. For the truck electrification rule to be truly impactful on the health of Californians, more than 4% of California’s truck population should be electric by 2030. The 15% electric truck population proposed by a coalition of state and national environmental groups[[5]](#footnote-5), would better realize the health benefits of truck electrification for Californians.

Please note that the results shared here are preliminary and in preparation for publication; we appreciate that you do not reprint or distribute the estimates provided in these comments. I am happy to share more detailed results when the publication is under review. The views expressed in these comments are my opinions and do not necessarily represent the views of George Washington University or the Milken Institute School of Public Health.

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1. For the year 2010. [↑](#footnote-ref-1)
2. Fann, N., Kim, S.-Y., Olives, C., & Sheppard, L. (2017). Estimated Changes in Life Expectancy and Adult Mortality Resulting from Declining PM2.5 Exposures in the Contiguous United States: 1980-2010. *Environmental Health Perspectives*, *125*(9), 097003. https://doi.org/10.1289/EHP507. Zhang, Y., West, J. J., Mathur, R., Xing, J., Hogrefe, C., Roselle, S. J., … Wong, D. C. (2018). Long-term trends in the ambient PM2.5- and O3-related mortality burdens in the United States under emission reductions from 1990 to 2010. *Atmospheric Chemistry and Physics*, *18*(20), 15003–15016. https://doi.org/10.5194/acp-18-15003-2018 [↑](#footnote-ref-2)
3. Achakulwisut, P., Brauer, M., Hystad, P., & Anenberg, S. C. (2019). Global, national, and urban burdens of paediatric asthma incidence attributable to ambient NO2 pollution: estimates from global datasets. *The Lancet. Planetary Health*, *3*(4), e166–e178. https://doi.org/10.1016/S2542-5196(19)30046-4 [↑](#footnote-ref-3)
4. Bay Area Air Quality Management District, & West Oakland Environmental Indicators Project. (2019). *Owning Our Air: The West Oakland Community Action Plan Volume 1.* Retrieved from http://www.baaqmd.gov/~/media/files/ab617-community-health/west-oakland/100219-files/final-plan-vol-1-100219-pdf.pdf?la=en [↑](#footnote-ref-4)
5. https://www.arb.ca.gov/lists/com-attach/12-cleantrucks-ws-AmNcPlQjUmBVPQdk.pdf [↑](#footnote-ref-5)