Health Professionals for a Healthy Climate

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The Honorable Jessica A. Palmer-Denig
Office of Administrative Hearings
600 N Robert St.
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March 12, 2021

RE: Proposed Rules Adopting Vehicle Greenhouse Gas Emissions Standards – Clean Cars Minnesota, Minnesota Rules, chapter 7023; Revisor's ID number 04626, OAH docket number 71-9003-36416

Dear Judge Palmer-Denig:

Health Professionals for a Healthy Climate supports Clean Cars Minnesota. Health Professionals for a Healthy Climate (HPHC) is a network of over 500 nurses, doctors, public health experts, and allied health professionals from across the state of Minnesota. HPHC supports the Minnesota Pollution Control Agency's rulemaking to implement clean car standards, including low emission vehicle standards and zero emission vehicle standards in Minnesota. Clean cars rules are needed to reduce and eventually eliminate vehicular greenhouse gas emissions, which contribute to adverse health impacts from both air pollution and climate change. Regulating vehicle emissions is in alignment with the MPCA's mission to protect and improve the environment and human health.

We are facing a climate crisis and immediate action is needed to address this crisis in every sector of our economy, including transportation, the number one contributor to greenhouse gas (GHG) emissions in our state. As described on pages 14-18 of the Statement of Need and Reasonableness (SONAR), Minnesota's latest report on GHG emissions[1] shows we are not on target to reach most of our legislatively mandated goals for GHG reductions in the 2007 Next Generation Energy Act. We failed to meet the 2015 goal of 15% reduction from 2005 levels and, as of 2021, have only reduced total GHG emissions by 8%. Emissions in the transportation sector have decreased by only 7% since 2005, and have recently leveled off. The MPCA's proposed Clean Cars Program will help us meet our overall GHG reduction goals and also help us make significant progress on meeting goals in the transportation sector. Page 77 of the

SONAR estimates that GHG emissions reductions of 8.4 million tons (well-to-wheel) can be achieved in the first 10 model years of Clean Cars implementation.

In addition to reductions in GHGs, the SONAR page 9 describes estimated reductions in air pollutants, including particulate matter, non-methane organic gases, and nitrogen oxides. As described on pages 18-19 of the SONAR, reductions in air pollutants resulting from clean cars standards will save lives and improve health, especially in neighborhoods with higher percentages of people of lower income, people of color, and Indigenous people who already experience high levels of air pollution. It will also improve air quality in other areas of our state most impacted by air pollution, such as southern and southeastern Minnesota and counties with larger populations of seniors, people without health insurance, or people living in poverty. Models demonstrate that including wind energy in the energy grid mix and increasing the use of low or no-emission vehicles reduces two of the worst air pollutants, ozone and PM2.5.[2] Electric vehicles powered on a clean energy grid can reduce environmental health impacts by fifty percent.[3]

A. **Comments on rule language.** HPHC agrees with the draft rules as proposed, except for 7023.0300, Subpart 5. HPHC opposes the inclusion of a "one-time credit allotment" as unnecessary to implement the program and suggests that the ZEV Credit Bank should only include "early action credits." The "one-time allotment" should be removed for the following reasons:

- **The one-year delay in rule implementation reduces the compliance obligation on automakers.** The original ZEV credit bank proposal was designed when enforcement would begin in calendar year 2023. However, now that the clean cars rule wouldn't go into effect until calendar year 2024, automakers have enjoyed a "free" year off of compliance and therefore won't need to accrue as many ZEV credits as originally thought.
- **Early Action gives credit for real sales, the one-time allotment does not.** The climate crisis demands real action now and the early action credits incentivize automakers to deliver EVs to market sooner, which benefits Minnesotans. The one-time allotment awards automakers free credits without additional action or added benefit to Minnesotans.

B. **Comments on the Statement of Need and Reasonableness (Health benefits analysis p. 81-91), Appendix 1: Technical Support Document (Health and equity analysis, pages 73-77), and February 2021 Addendum to the SONAR.** The MPCA presents a strong case for the health and health equity benefits of Clean Cars Minnesota. Their analysis of these benefits is both reasonable and compelling. MPCA utilizes currently available EPA models to estimate health benefits and avoided health costs. MPCA acknowledges that these models do not consider all health problems associated with air pollution and states on page 74 of App. 1 of the SONAR: "Thus, this analysis is probably an underestimation of the possible benefits of Clean Cars Minnesota." HPHC agrees that these models underestimate the health benefits of this program. We therefore present the following information to support a stronger case for the health benefits of Clean Cars Minnesota than that presented in the SONAR.

Appendix 1, p. 74 describes two models that the MPCA utilized to estimate health benefits, which include: a) EPA's "Estimating the Benefit per Ton of Reducing PM2.5 Precursors from 17 Sectors" ; and b) EPA's "CO-Benefits Risk Analysis (COBRA) Health Impacts Screening Tool," a plug-in model that is useful for estimating the health benefits from reductions in PM2.5 pollution on several health endpoints known to be associated with exposure to PM2.5. The Benefit per Ton and COBRA models are currently available and useful tools for estimating health benefits from reducing vehicle pollution, but have two critical limitations, as follows.

B.1. The Benefit per Ton and COBRA models do not include many health endpoints associated with exposure to PM2.5 pollution.

The Benefit per Ton and COBRA models <u>do</u> consider the following health endpoints associated with exposure to PM2.5 air pollution:

- Adult and infant mortality;
- Non-fatal heart attacks;
- Respiratory-related and cardiovascular-related hospitalizations;
- Acute bronchitis;
- Upper and lower respiratory symptoms;
- Asthma-related emergency room visits;
- Asthma exacerbations;
- Minor restricted activity days (i.e., days on which activity is reduced, but not severely restricted); and
- Work-days lost due to illness.

In the following paragraph, we present the evidence for health effects not included in the MPCA health benefits analysis, which cannot be readily quantified, but will demonstrate that there are additional health and economic benefits from reducing vehicle pollution in Minnesota.

Health endpoints associated with exposure to PM2.5 and other air pollutants <u>not</u> included in the Benefit per Ton and COBRA models:

- **Decreased lung function in children.** A large study and meta-analysis found that long-term exposure to traffic pollutants is associated with decreased lung function in children.[4] Decreased lung function early in life may persist and is associated with a higher risk of asthma and increased risk of cardiovascular disease in adults. One study found that children's lung function improved when levels of PM2.5 and nitrogen dioxide (NO_2) were reduced.[5]
- **Chronic bronchitis.** Exposure to PM2.5 and NO_2 was associated with chronic bronchitis.[6] A study in California demonstrated that decreasing NO_2, PM2.5, PM10, and ozone pollution was associated with a decrease in bronchitic symptoms in children.[7]

- **Cancer.** An American Cancer Society study of 1.5 million adults concluded that "Long-term exposure to combustion-related fine particulate air pollution is an important environmental risk factor for cardiopulmonary and lung cancer mortality."[8] Another study found an elevated risk for lung cancer incidence among people who never smoked, but were environmentally exposed to black smoke or high traffic pollution.[9] In addition to lung cancer, long-term exposure to air pollutants is associated with higher mortality for many other types of cancer, including breast, liver, and pancreatic cancers.[10, 11]

- **Diabetes.** Exposure to air pollution, especially NO_2, increased the incidence of diabetes and diabetic and cardiovascular mortality among those already diagnosed with these diseases.[12]

- **Hypertension and atrial fibrillation**. An acute increase in blood pressure was associated with brief exposure to coarse particulate matter in urban[13] and rural locations.[14] A large cohort study found that long-term exposure to traffic-related air pollution was associated with a higher risk of atrial fibrillation.[15]

- **Cerebrovascular ischemic stroke.** A 2013 Global Burden of Disease study concluded that "air pollution has emerged as a significant contributor to global stroke burden."[16]

- **Damage to kidneys and chronic kidney disease.** New information is emerging on adverse effects on the kidney from air pollution. "The inflammatory mediators induced by PM and other pollutants in the lungs could spill over into the circulation, resulting in systemic inflammation, oxidative stress and damage to distant organs including kidneys." [17] There is also evidence of direct harm to the kidneys. A large cohort study of veterans concluded that exposure to PM2.5 air pollution was linked to increased risk for chronic kidney disease and progression to end stage renal disease.[18]

- **Consideration of children's unique vulnerability to air pollution during critical developmental stages.** While the Benefit per Ton and COBRA models account for the health endpoints of infant mortality and children's asthma and bronchitis symptoms and outcomes, they do not account for the health endpoints that are related to the unique vulnerability of children *in utero* and in early childhood during critical stages of brain development.
  - **Birth outcomes.** A meta-analysis of 62 studies links higher risk for low birth weight to *in utero* exposure to air pollutants (carbon monoxide, PM10, PM2.5, and nitrogen dioxide) and higher risk for preterm birth with third trimester exposure to these pollutants.[19] Black mothers exposed to air pollution and extreme heat during pregnancy are at higher risk than white mothers for stillbirth, premature birth and underweight babies.[20]
  - **Effects on brain development.** Children are exposed to numerous brain toxins throughout their lifetime, including in the womb. The estimated annual cost of neurodevelopmental disorders linked to environmental exposures, including air pollution, is $74.3 billion a year. Combustion-related air pollution is associated with an array of adverse effects on brain development in areas including intelligence, memory, behavior, attention and anxiety. Specific air pollutants that harm developing brains are polycyclic aromatic hydrocarbons (PAHs), PM2.5, NO_2 and

black carbon.[21] Prenatal exposure to traffic related air pollutants[22] and PM2.5 are also linked to increased risk of autism spectrum disorder.[23] Because low- income and communities of color have greater exposure to air pollution, it puts them at higher risk for neurodevelopmental disorders in children.

The financial benefits of improved child health in California due to reducing air pollutants over a 20-year period are estimated at $1.6 to $2.6 billion due to reduced post neonatal mortality, asthma hospitalizations, ER visits, school absences and low birth weight infants.[24] Some, but not all, of these costs are considered in the EPA models that MPCA utilized.

B.2. The Benefit per Ton and COBRA models are based on PM2.5 exposure, and do not consider other air pollutants associated with adverse health effects, such as ground-level ozone, NO_2, sulfur dioxide (SO_2), carbon monoxide (CO) and Volatile Organic Compounds (VOCs). Air pollutants NO_2, SO_2 and VOCs are precursors to PM2.5 pollution, but are also individually harmful to human health. Ozone is created when sunlight reacts with pollutants nitrogen oxides, CO and VOCs. Ozone levels increase on hot days, which are becoming more frequent with global warming.

- **Ozone.** Exposure to ozone causes breathing problems, reduces lung function and causes lung diseases. Ozone triggers asthma exacerbations and ground-level ozone is associated with increases in emergency room visits.[25]
- **Nitrogen dioxide (NO_2).** Exposure to NO_2 reduces lung function and causes symptoms of bronchitis in asthmatic children.[26]
- **Sulfur dioxide (SO_2).** Exposure to SO_2 reduces lung function and causes eye irritation, respiratory inflammation, asthma aggravation, chronic bronchitis and a higher risk of respiratory infections.[27]
- **Volatile organic compounds (VOCs).** Several VOCs, including benzene, acetaldehyde, and 1,3-butadiene, are carcinogens. VOCs are important sources of indoor air pollution and also components of outdoor air pollution. However, the main concern with VOCs in outdoor air relates to their role in the formation of ground-level ozone, a constituent of photochemical smog. Many VOCs form ground-level ozone by reacting with nitrogen oxides and CO in the atmosphere in the presence of sunlight.[28]
- **Carbon monoxide (CO).** When inhaled, CO impairs oxygen delivery to the brain, heart, and other vital organs. Exposure to CO as a component of outdoor air pollution may result in reduced oxygen delivery to the heart and therefore impact people with heart disease, possibly causing angina.[29]

B3. Clean Cars Bring Greater Benefits for Environmental Justice (EJ) Communities. The MPCA presents an equity analysis (SONAR, pp. 77-86), which supports the fact that there is greater exposure to traffic pollution for Minnesotans who are lower income, Black, Indigenous, or people of color. The inequities we see in Minnesota are also evident nationwide. Several studies have shown that people who are non-white,[30] [31] and those with lower socio-economic status[32] are exposed to higher levels of air pollution and are more susceptible to its adverse

effects. The burden of PM emissions for people living in poverty, people who are non-white, and people who are Black is 1.35, 1.28, and 1.58 times greater, respectively, than for the overall population. These disparities applied both nationally and for most states and counties.[33] On p. 83-84 of the SONAR, the MPCA estimates that the new Clean Cars rules will result in higher reductions in PM2.5 for EJ-identified areas. Because the Benefit per Ton and COBRA models do not consider all of the health endpoints associated with exposure to air pollution and do not consider all of the vehicle-related pollutants, the benefits to BIPOC and lower income communities who reside in high traffic areas are underestimated in the SONAR.

HPHC concludes that the health and economic benefits for Minnesotans, especially BIPOC and lower income communities, will be greater than those presented in the SONAR, making an even stronger case for implementation of Clean Cars Minnesota.

Establishing clean cars standards is an important strategy to reduce carbon emissions and improve air quality, especially for communities already living with high levels of air pollution. Clean car standards are necessary for Minnesota to do its part in addressing the climate crisis and transitioning to a healthy, zero-carbon future. Thank you for the opportunity to comment on the MPCA's proposed clean cars rules.

Respectfully yours,

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Brenna Doheny, PhD, MPH, Executive Director
David Hunter, MD, Policy Committee Member

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