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Re: Docket ID No. EPA–HQ–OAR–2025–0194. Reconsideration of 2009 Endangerment Finding and Greenhouse Gas Vehicle Standards

Safeguarding Workers in a Warming World: Why Rolling Back Greenhouse Gas Standards Threatens Occupational Health and the U.S. Economy

Executive Summary

Bottom Line Up Front: The Environmental Protection Agency's (EPA) proposal to rescind the 2009 Endangerment Finding and Greenhouse Gas (GHG) Vehicle Standards and repeal these vehicle GHG standards would undermine decades of progress on climate mitigation efforts, accelerate heat exposure and air-pollution risks faced by United States (U.S.) workers, and impose steep economic costs on employers and the greater economy. Robust scientific evidence—including the agency's own analyses—shows that continued climate action and strong heat-illness prevention programs protect health, boost productivity, and deliver returns that far exceed compliance costs.

1. **The Proposed Repeal Conflicts with EPA's Core Duty to Protect Health**

The Clean Air Act obliges the EPA to safeguard public health and welfare. In 2009, the agency determined that six well-mixed greenhouse gases endanger health and welfare and that motor-vehicle emissions are a significant contribution to the burden of these gases. The proposed rule now claims that *global climate change concerns* lie "outside" the statute's scope and that no "requisite technology" exists to address them.[1]

In contrast to the assertions by the EPA, comprehensive reviews of the scientific literature since 2009 show that greenhouse gases endanger worker safety and health:

- A 2009–2021 review by Schulte et al. finds "substantial literature" on rising worker morbidity and mortality from heat, extreme weather, vector-borne disease, air pollution, and other climate-driven hazards.[2]

- A 2024 review article by Gibb et al. concludes that higher temperatures will "cause increasing heat-related morbidity and mortality for workers across the globe," noting exceptionally high risks for agriculture, construction, mining, firefighting, and manufacturing workers.[3]

These peer-reviewed publications conclusively demonstrate that greenhouse-gas pollution is inextricably linked to health harm to workers by effects on multiple organ systems. Curtailing EPA authority would leave millions of workers more vulnerable.

Additionally, the EPA conducted its own review of climate change and impacts on workers.[4] This review found that millions of American workers specifically face heightened health risks from climate change due to occupational exposures that the general population can avoid. The EPA outlined how climate change threatens worker health through five key pathways[4]:

i. **Heat illnesses** pose the most significant immediate danger, with most outdoor heat-related deaths occurring in workers' first few days in warm environments before their bodies can adapt.

ii. **Respiratory illnesses** are increasing due to worsening air quality from ground-level ozone, particulate matter, and wildfire smoke, particularly affecting firefighters and agricultural workers. Extended pollen seasons further exacerbate respiratory conditions.

iii. **Physical and mental health effects** from extreme weather events impact emergency responders and disaster recovery workers, causing injuries, deaths, and psychological trauma, including anxiety, depression, and post-traumatic stress disorder (PTSD).

iv. **Vector-borne diseases** like Lyme disease and West Nile virus are spreading as warmer temperatures increase mosquito development and expand tick ranges.

v. **Pesticide exposure** is intensifying as changing pest populations drive increased agricultural chemical use.

The EPA also emphasized that certain workers face compounded risks when they belong to multiple vulnerable populations, such as older workers with health conditions.

2. Climate-Driven Heat is Already a Workplace Emergency

2.1. Escalating heat exposure

According to the EPA, "The United States is expected to continue to warm faster than other parts of the world. As average temperatures increase, the risk of extreme heat goes up."[5] Temperature records have been broken repeatedly in the U.S. over the past decade. The EPA has highlighted the health impacts on workers: "People who work outdoors are more exposed to extreme heat. This can include agriculture, fishing, construction, transportation, utility, or delivery workers."[6] Studies show the severe impact of escalating heat exposure among workers:

- Among U.S. construction workers, heat-related fatalities accounted for 36% of all occupational heat deaths between 1992 and 2016.[7]
- In California, rates of heat-related illness doubled between 2000 and 2022, with over 20,000 heat-related illness (HRI) workers' compensation claims filed.[8]

Furthermore, the International Labor Organization's (ILO) 2024 global review pinpoints six climate-sensitive hazards—excessive heat, solar UV, extreme weather, air pollution, vector-borne disease, and agrochemicals—and documents how each is already harming U.S. workers and the broader economy.[9]

1. Excessive heat

- Construction accounts for 36% of all U.S. occupational heat deaths (1992-2016), even though the trade is only 6% of the labor force; heat fatalities in all sectors rose another 18.6% in 2022.
- California workers suffer about 20,000 extra injuries each year when daily highs edge upward, costing society US$1 billion; injury risk is 6-9% higher above 90°F and 10-15% higher above 100°F.
- Farmworkers are 35 times more likely to die from heat than in other occupations, jeopardizing the nation's 2.6 million agricultural jobs.

2. Solar ultraviolet radiation

Outdoor trades receive two to three times the annual UV dose of indoor staff. U.S. construction workers—8% of the workforce—account for roughly 40% of occupational skin-cancer cases and deaths.

3. Extreme weather

Wildfire frequency and intensity elevate risks for firefighters and emergency crews. All 86 female firefighters examined in one study carried four or more perfluoroalkyl and polyfluoroalkyl substances (PFAS) compounds in their blood, chemicals linked to several cancers. Weather disasters are also increasing heat, smoke, and chemical exposures for utility, transport, and clean-up workers.

4. Workplace air pollution

Health-care costs attributed to U.S. air pollution already exceed US$800 billion a year; climate-driven wildfires and ozone spikes are expected to raise this bill and erode labor productivity.

5. Vector-borne disease

Warming has nearly doubled Lyme-disease incidence since 1991 (from 3.74 to 7.21 cases per 100,000) and expanded tick habitat into new states, threatening forestry, landscaping, and park personnel.

6. Agrochemicals

Higher temperatures and new pest ranges are driving heavier pesticide use. Organophosphate exposure alone is estimated to cost U.S. society up to US$42 billion annually in health care and lost output; greenhouse and field workers shoulder the most significant burden.

Aggregate economic losses

- Heat stress could cut 2.2% of global work hours by 2030—equal to 80 million full-time jobs—and shave US$2.4 trillion off world GDP; the U.S. absorbs a large share through reduced construction, transport, and agriculture output.
- Outdoor-air-pollution health spending worldwide will soar from US$21 billion (2015) to US$176 billion (2060); the present U.S. slice is already > US$800 billion.
- Climate-related disasters caused US$166 billion in direct losses in 2018 alone; 45% of all disaster deaths since 1970 occurred in high-income nations, underscoring risk to U.S. communities.

As the ILO concludes, without rapid mitigation and workplace adaptation, climate change will accelerate injury, illness, and economic drag across the U.S. labor market.

2.2. Economic costs of unmitigated heat

Heat stress lowers labor productivity, inflates workers' compensation premiums, and triggers turnover. According to a 2023 report by the Atlantic Council's Adrienne Arsht-Rockefeller Foundation Resilience Center and Vivid Economics, lost labor capacity from heat in the U.S. costs nearly $100 billion annually, disproportionately in agriculture, construction, manufacturing, and service sectors.[10] Moreover, they found that nearly all U.S. counties are feeling the economic impacts of extreme heat, with labor-productivity losses expected to cost half a trillion dollars annually by 2050.[10]

Additional data from the Bureau of Economic Analysis (BEA) indicate that the construction sector contributes significantly to economic output, and thus, lost labor activity due to extreme heat will have a noticeable impact, primarily affecting this sector.[11]

3. Air Pollution and Climate: Double Threat to Worker Safety

Heat is only part of the risk. Rising temperatures amplify ground-level ozone and fine-particle ($PM_{2.5}$) formation, creating a "double blow" for outdoor workers.[2] Controlled human-exposure and epidemiologic studies reviewed by Schulte et al. link ozone and $PM_{2.5}$ spikes to acute respiratory illness, lost workdays, and cardiovascular events.[2] Climate-driven wildfires exacerbate exposures; firefighters experience chronic lung-function declines and elevated heart-rate strain during active fire seasons.[12]

Employers have limited ability to control ambient air pollution at worksites, which underscores the necessity of upstream mitigation (i.e., reducing fossil-fuel combustion in favor of zero-emission vehicles and clean energy).

4. Worker Health Vulnerabilities: Climate Harms those in the Lower Socioeconomic Bracket

According to the Kaiser Family Foundation, there are over 65 million nonelderly adult workers in the U.S. in occupations at increased risk for climate-related health risks, accounting for over four in ten of nonelderly workers.[13] These primarily low-wage workers make up a sizeable share of those in occupations with increased exposure to heat, extreme weather, vector-borne and infectious diseases, and environmental contaminants.[13] These workers often lack health insurance, paid leave, or decision-making power to refuse hazardous tasks. The EPA's proposed rollback would magnify these effects by accelerating climate stressors while removing regulatory impetus for cleaner technologies.

5. Evidence-Based Solutions Deliver Returns

5.1. Climate-mitigation standards

Vehicle GHG standards drive technological innovation—light-duty fuel-economy improvements, electric-vehicle deployment, and cleaner supply chains. Analyses of prior EPA vehicle rules projected **net benefits of $120 to $190 billion**, mainly from fuel savings, pollution-related health gains, and climate-damage avoidance.[14] Repealing them sacrifices these gains and locks in higher future compliance costs.

5.2. Heat-illness prevention guidelines

CDC/NIOSH and the American Conference of Governmental Industrial Hygienists have issued evidence-based recommendations to protect workers against heat –hydration, shade/cool areas, acclimatization schedules, engineering controls, wearable cooling, paid rest breaks, and medical surveillance.[15,16]

The 2016 NIOSH Criteria for a Recommended Standard on Occupational Exposure to Heat and Hot Environments reviews contemporary evidence showing that uncompensated metabolic and environmental heat loads can precipitate a spectrum of disorders ranging from heat rash and syncope to exertional heat stroke and rhabdomyolysis, accentuated by dehydration, inadequate acclimatization, certain medications, obesity, advanced age, and comorbid disease.[17] It reaffirms Wet Bulb Globe Temperature–based Recommended Alert Limits for unacclimatized workers and Recommended Exposure Limits for acclimatized workers, advocates structured acclimatization, hydration (~250 mL every 15–20 min with electrolyte replacement during prolonged sweating), work/rest regimens, engineering and administrative controls, medical surveillance, and real-time physiologic monitoring of core temperature and heart rate to maintain deep body temperature below 38–38.5 °C. The document underscores that effective prevention programs require worker and supervisor training, heat-alert plans keyed to meteorological forecasts, prompt on-site cooling of symptomatic employees, and ongoing research into climate change impacts, individual susceptibility, and the interaction of heat stress with chemical toxicology.

This document highlighted the following:

i. **Occupational heat stress is becoming an increasingly urgent medical concern, particularly for workers in densely populated regions near the equator.** There is accumulating evidence that rising global temperatures—amplified by urban heat island effects—are intensifying physiological stress among at-risk populations, correlating with increased rates of heat-related illnesses such as heat exhaustion, heat stroke, renal injury, and cardiovascular events, especially in outdoor and non-climate-controlled workplaces. These changing environmental conditions, driven by climate change, are altering both the geographic and seasonal distribution of heat morbidity and are creating enduring public health challenges for vulnerable occupational groups.[18]

ii. **It addressed the interaction between elevated environmental heat and toxicological exposures in the workplace.** Although research since this NIOSH guideline has yielded new insights, there remains a critical lack of human data concerning the ways hyperthermia influences uptake, distribution, and responses to workplace chemicals. Animal data suggests that heat exposure can enhance cutaneous and respiratory absorption of certain chemicals and alter pharmacokinetics via changes in hydration status and renal function; these effects may potentiate toxic risks. However, the degree to which these

findings translate to human occupational exposures remains undefined, and the extent to which global climate change could amplify the severity, distribution, or synergistic toxicity of heat-chemical co-exposures is as yet unclear. Further research—both clinical and mechanistic—is imperative to inform workplace standards and preventive strategies better as climate warming continues.[19-23]

In addition, evidence from recent scientific literature and policy organizations shows that outdoor heat stress is a growing occupational problem for workers in temperate, arid, tropical, and subtropical regions, not limited to those near the equator:

- A systematic review in BMC Public Health found heat stress is an escalating occupational risk for outdoor workers worldwide, across 14 countries. It recommended comprehensive mitigation strategies for all climates, explicitly including hot-dry and hot-humid regions beyond the equator.[24,25]
- Another systematic review concluded that heat-related stress is a significant occupational hazard for outdoor workers regardless of geographic region, recommending prevention strategies at the company, national, and international levels for worker safety everywhere.[26]
- A recent global analysis in Nature Communications demonstrated that per capita working hours exposed to heat stress have increased substantially in all regions, with both developing (e.g., India, Nigeria, Thailand) and developed economies (e.g., Germany, U.S.) registering significant exposure and lost productivity. However, rates are higher in warmer countries.[27]
- The World Health Organization states that heat stress is the leading cause of weather-related deaths and that it threatens workers' health everywhere, affecting underlying diseases and exacerbating workplace accidents even outside tropical zones.[28]
- The Global Heat Health Information Network reports that occupational heat stress reduces productivity, safety, and health at considerably lower temperatures and impacts workers in both indoor and outdoor sectors worldwide, not limited by latitude.[29]
- Policy briefings from the World Economic Forum and UN labor agencies estimate that more than 70% of the global workforce is now at risk from excessive heat, with 2.4 billion workers potentially endangered by increasingly severe heatwaves everywhere.[30]
- Researchers have documented high odds ratios for heat-related illness among outdoor workers in the US, Europe, Central America, Africa, South Asia, and elsewhere, confirming that heat stress is a ubiquitous concern in agriculture, construction, transport, and other labor-intensive professions everywhere, especially during heatwaves.[31-34]

Current state heat standards have demonstrated effectiveness, as highlighted in these examples:

- After California instituted mandatory outdoor heat protections in 2005, with revisions in 2015 placing more specific and enforceable regulations, there was a 43 percent decrease in deaths relative to the average county that reported deaths related to outdoor work from 2001 through 2020.[35]

- A central Texas municipality that removed medical surveillance from its program saw heat-illness rates jump from **1.0 to 7.6 per 1,000 workers** within two years, underscoring the importance of comprehensive plans.[36]

Thus, the contemporary scientific and health policy consensus is clear—heat stress is a significant hazard for outdoor workers worldwide, not just near the equator, with increasing risks due to global climate change and frequent extreme heat events.

6. Economic Competitiveness

Opponents of climate standards often argue that standards impose unsustainable burdens on business. In contrast, federal Occupational Safety and Health Administration's (OSHA) recent economic feasibility analysis for its proposed Heat Injury and Illness Prevention rule concluded that the economic benefits of protecting workers against heat illness substantially outweigh the compliance costs.[37]

Economic Benefit vs. Compliance Cost:

- OSHA's regulatory impact analysis finds that the proposed heat standard would yield approximately $9.2 billion in annual benefits, compared to an annual compliance cost of $7.8 billion.[38] This means that for every dollar spent on compliance, there is more than a dollar in societal and economic benefits.
- These benefits come from a combination of avoided productivity losses due to heat-related injuries and illnesses, reduced medical and workers' compensation costs, and improved worker safety, especially among vulnerable populations such as low-income and Hispanic workers who experience higher rates of heat-related incidents.[2]
- Failure to implement a federal heat standard is estimated to cost the U.S. economy nearly $100 billion each year due to productivity losses, increased healthcare expenses, and absenteeism. The proposed OSHA standard directly addresses these costs by establishing requirements for rest breaks, access to cool water, acclimatization, and monitoring, which have demonstrable payoffs in reduced illness and boosted productivity.

Who Benefits:

- The analysis shows that the most significant positive impact will be among underserved populations—workers with low incomes, those in physically demanding jobs like construction, agriculture, and manufacturing, with exposure to heat.
- Small businesses and some financially precarious firms might face higher compliance burdens; however, OSHA's industry-by-industry feasibility review found that costs are not prohibitive, and many firms already implement part of the required measures.

7. The Legal and Scientific Basis Remains Strong

The EPA's proposed rescission asserts that the Clean Air Act does not encompass global climate pollutants and that recent court rulings (e.g., *West Virginia v. EPA*) constrain agency authority.[1] Yet, that decision pertained to power-plant regulation under Section 111(d), not to mobile-source

standards under Section 202(a), which the Supreme Court previously affirmed in *Massachusetts v. EPA*. In short, rescission contradicts established precedent and the agency's stated mission.

8. Recommendations

Withdraw the repeal proposal and retain the 2009 Endangerment Finding. The overwhelming body of scientific evidence since 2009 reinforces—not weakens—the conclusion that greenhouse gases endanger the health and welfare of workers in the U.S. Eliminating the EPA's endangerment finding disregards the robust scientific consensus that the six regulated air pollutants, including carbon dioxide, directly and indirectly harm worker health. Decades of research have demonstrated that exposure to these pollutants—especially particulate matter, ozone, and greenhouse gases—causes and aggravates respiratory and cardiovascular diseases, increases the risk of heat-related illnesses, and makes workers more susceptible to infectious diseases. The effects are seen not only in medically diagnosed conditions but also in elevated rates of lost productivity, disability, and even premature death among the U.S. workforce. These risks are intensified for outdoor and manual laborers, who are more frequently and severely exposed to air pollution and heat stress.[39-44]

Medically, repealing the endangerment finding would undermine protections for workers across many sectors by enabling higher concentrations of recognized hazardous pollutants in the air. Scientific and legal reviews repeatedly affirm these pollutants must be regulated because their cumulative impacts extend far beyond the workplace, contributing to public health burdens through increased hospitalizations, chronic illnesses, and labor market disruptions. The Clean Air Act mandates a precautionary, science-based approach, not requiring absolute certainty but reasonable anticipation of harm, as upheld by both courts and health authorities. Dismissing these findings would ignore the substantial and growing evidence of occupational and societal harm, jeopardizing not only worker safety but also national health and productivity.[41-42; 45-47]

Conclusion

The science is unequivocal: climate change is already harming U.S. workers through extreme heat, air pollution, and related hazards, with costs measured in billions of dollars, lost lives, and eroded productivity. Rolling back greenhouse-gas standards would amplify those harms. Conversely, maintaining and strengthening climate regulations, alongside robust workplace heat protections, offers considerable net benefits—saving employers money, safeguarding vulnerable communities, and advancing the EPA's statutory obligation to protect public health and welfare. The agency should follow the evidence, not retreat from it.

If you have any questions or need additional information, please contact Julie Ording, MPH, ACOEM Director, Scientific Affairs at julie@acoem.org.

Sincerely,

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