Case No. 21-16278

IN THE UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

CALIFORNIA RESTAURANT ASSOCIATION,

Plaintiff-Appellant,

v.

CITY OF BERKELEY,

Defendant-Appellee.

On Appeal from the United States District Court
for the Northern District of California
No. 4:19-cv-07668-YGR

BRIEF OF *AMICI CURIAE* PHYSICIANS FOR SOCIAL RESPONSIBILITY & AMERICAN THORACIC SOCIETY IN SUPPORT OF REHEARING EN BANC

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RULE 29 STATEMENTS

Pursuant to Fed. R. App. P. 29(a)(2), *amici curiae* certify that all parties in this proceeding have consented to the filing of this amicus brief.

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Dated: June 12, 2023

/s/ *Timothy R. Oberleiton*
TIMOTHY R. OBERLEITON

INTERESTS OF THE *AMICI CURIAE*

Amici are leading physician-member public health organizations comprised of experts in public health and medicine focused on climate change advocacy and bettering climate health. *Amici* support efforts to limit continued use of gas-fueled applications in buildings in the interest of improving public health, including the City of Berkeley's ordinance and other state and local efforts.

Amicus Physicians for Social Responsibility ("PSR") is a national nonprofit education and advocacy organization founded in 1961 that mobilizes physicians and health professionals to advocate on issues that threaten communities, and leverages medical and public health expertise to reverse the trajectory towards global warming and protect public health.

Amicus American Thoracic Society ("ATS"), an international educational and scientific organization founded in 1905, represents more than 15,000 healthcare professionals. ATS works to prevent and fight respiratory disease around the globe through research, education, patient care, and advocacy. ATS publishes three peer-reviewed scientific journals that disseminate groundbreaking research, including studies on the relationship between emissions and human health outcomes.

INTRODUCTION

The gas appliances inside of our homes, schools, and workplaces are making us sick. Emissions from gas appliances and the burning of methane gas[1] indoors have wide-ranging health impacts that have been well-known for decades. But the last decade of peer-reviewed scientific literature has uncovered the true extent and severity of the connection between gas appliances and adverse health outcomes. It is now indisputable that methane gas-powered building appliances are a leading source of indoor air pollution. The burning of methane gas produces high levels of harmful indoor emissions that often exceed federal outdoor air quality standards. The consequent air pollution inside buildings has a significant impact on human health and can lead to a range of serious negative health outcomes, including the development and exacerbation of lung diseases, such as asthma and chronic obstructive pulmonary disease, cardiovascular disease, cognitive deficits, cancer, and death. The World Health Organization estimates that household air pollution

[1] Termed "natural gas" by the gas industry, methane gas refers to distribution-grade methane for consumer end use that is harvested or produced by a variety of means including drilling, hydraulic fracturing ("fracking"), as well as through anaerobic digestion from waste sources (the product of which is often termed "renewable natural gas").

alone was responsible for 3.2 million deaths per year in 2020,[2] and the connection between the burning of gas and asthma risk is well-established.[3]

Abating the public health harms associated with gas appliance emissions requires a range of regulatory and policy efforts—chief of which is removing gas appliances as the source of those emissions. A panel of this Court ("the Panel") issued an opinion erroneously interpreting the Energy Policy and Conservation Act ("EPCA") as preempting the City of Berkeley's ordinance prohibiting gas infrastructure in new buildings. This overboard interpretation threatens dozens of different types of state and municipal measures within the Circuit—and across the nation—that seek to address methane gas' contribution to climate change and degraded outdoor air quality, as well as the public health crisis caused by methane gas appliances. This faulty reading of EPCA has the potential to bring ongoing state and local efforts to protect public health to a screeching halt, and would frustrate attempts for policymakers to take the steps necessary to curb public health harms by limiting the sources of those harms—gas appliances.

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[2] World Health Organization, Household Air Pollution, https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health (last visited June 9, 2023).

[3] Weiwei Lin *et al.*, *Meta-Analysis of the Effects of Indoor Nitrogen Dioxide and Gas Cooking on Asthma and Wheeze in Children*, 42 INT'L J. EPIDEMIOLOGY 1724 (2013).

The Panel's overbroad opinion threatens to limit the ability for states and localities to adopt sensible regulations to ensure the health and safety of their residents, thereby presenting an issue of exceptional importance warranting reconsideration. *Amici* support the City's request for rehearing *en banc* to correct the Panel's decision, and urge the Court to grant *en banc* rehearing to rectify the Panel's errors.

ARGUMENT

I. Gas appliances emit harmful air pollutants that degrade indoor air quality.

The delivery and use of methane gas for appliances in buildings represent a known danger to public health. At every stage—unburned, incompletely burned, and completely burned—gas from gas appliances all release harmful chemicals into household air.[4] Distribution-grade methane gas for consumer use in buildings itself contains methane (CH_4) and volatile organic compounds (VOCs), including benzene—all of which can be released in the event of a leak.[5] When burned, methane gas releases harmful pollution such as nitrogen oxides (NOx, which

[4] U.S. Env't Prot. Agency, *The Inside Story: A Guide to Indoor Air Quality*, https://www.epa.gov/indoor-air-quality-iaq/inside-story-guide-indoor-air-quality (last visited June 8, 2023) [hereinafter EPA Indoor Air Quality Guide].

[5] Drew R. Michanowicz *et al.*, *Home is Where the Pipeline Ends: Characterization of Volatile Organic Compounds Present in Natural Gas at the Point of the Residential End User*, 56 ENV'T SCI. & TECH. 10258 (2023), https://pubs.acs.org/doi/10.1021/acs.est.1c08298.

collectively describes gases including nitric oxide (NO) and nitrogen dioxide (NO_2)), fine particulate matter ($PM_{2.5}$), and carbon monoxide (CO), as well as benzene and formaldehyde[6] and, in the case of incompletely burned gas, polyaromatic hydrocarbons, and ultrafine particles.

These pollutants pose serious risks to human health. The U.S. Environmental Protection Agency ("EPA") has acknowledged that nitrogen oxide pollution, which is a precursor pollutant to ground-level ozone and fine particulate matter, is "an inherent consequence of fossil fuel combustion."[7] Carbon monoxide is an odorless, colorless, and toxic gas produced by the incomplete combustion of fuels,[8] and is emitted through the use of gas stoves, gas water heaters, and gas furnaces. Particulate matter is a term used for a mixture of solid particles and liquid droplets found in the air.[9] $PM_{2.5}$, or fine particulate matter, refers to inhalable particles with diameters that are 2.5 micrometers and smaller.[10] $PM_{2.5}$ is mainly produced by

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[6] Yifang Zhu *et al.*, UCLA, *Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California* at 6 (2020).

[7] U.S. Env't Prot. Agency, *Nitrogen Oxides*, 1-1 (1977), https://nepis.epa.gov/Exe/ZyPDF.cgi/2000XWPA.PDF?Dockey=2000XWPA.PDF (last visited June 8, 2023). *See also* Jim Dennison *et al.*, RMI, *How Air Agencies Can Help End Fossil Fuel Pollution from Buildings*, at 6 (2021).

[8] Brady A. Seals *et al.*, RMI, *Health Effects from Gas Stove Pollution* at 9 (2020), https://rmi.org/insight/gas-stoves-pollution-health/.

[9] 62 Fed. Reg. 38,652, 38,653 (July 18, 1997).

[10] *Id.* at 38,654 fn. 6.

"combustion processes and by atmospheric reactions of various gaseous pollutants."[11] As it relates to cooking, while $PM_{2.5}$ is a byproduct of both electric and gas stoves and ovens, emissions from gas stoves can be two times higher than those from electric stoves.[12]

Indoor environments are often more polluted than outdoor environments. According to EPA, indoor levels of pollutants may be two to five and as much as 100 times higher than outdoor air pollution levels.[13] The levels of these pollutants released into the home due to gas appliance use are alarming. Gas stoves used without exhaust hoods can expose household occupants to NO_2 levels that exceed health-based standards.[14] The use of gas burners is estimated to add between 25 to 39 percent more nitrogen dioxide emissions and between 21 to 30 percent higher concentrations of carbon monoxide indoors.[15] Fifteen years ago, in 2008, EPA

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[11] 71 Fed. Reg. 61,144, 61,146 (Oct. 17, 2006).

[12] Tianchao Hu *et al.*, Lawrence Berkeley Nat'l Lab'y, *Compilation of Published PM2.5 Emission Rates for Cooking, Candles and Incense for Use in Modeling Exposures in Residences* at 11 (2012).

[13] U.S. Env't Prot. Agency, *Why Indoor Air Quality is Important to Schools*, https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools (last visited March 31, 2023).

[14] Seals *et al.*, *supra* note 8, at 7, 21 (citing Jennifer M. Logue *et al.*, *Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California*, 122 ENV'T HEALTH PERSPECTIVES 43 (2014)).

[15] Wendee Nicole, *Cooking Up Indoor Air Pollution: Emissions from Natural Gas Stoves*, 122 ENV'T HEALTH PERSPS. 1 (2014), https://ehp.niehs.nih.gov/doi/10.1289/ehp.122-a27

found that "homes with gas cooking appliances have approximately 50 percent to over 400 percent higher average NO_2 concentrations than homes with electric cooking appliances."[16] The short- and long-term NO_2 levels in homes with gas stoves often exceed EPA outdoor air quality standards, which are less stringent than the indoor air quality guidelines issued by the World Health Organization and Health Canada.[17] Currently, the National Ambient Air Quality Standard (NAAQS) for NO_2 is 100 parts per billion (ppb) over a one-hour period. However, recent studies have shown that gas oven operation alone could produce enough peak NO_2 to exceed this one-hour standard within a matter of minutes.[18] High levels of NO_2 pollution are more likely when gas stoves are operated without the use of exhaust hoods.[19] Similarly, homes with gas stoves have higher levels of carbon monoxide. While the average level of carbon monoxide in homes without gas stoves varies from 0.5 to 5 parts per million (ppm), CO concentrations in homes with properly adjusted gas stoves are often 5 to 15 ppm, and homes with poorly adjusted stoves may have levels 30 ppm or higher.[20]

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[16] U.S. Env't Prot. Agency, *Integrated Science Assessment for Oxides of Nitrogen – Health Criteria*, 2-38 (2008).

[17] Seals *et al.*, *supra* note 8, at 11.

[18] Eric D. Lebel *et al.*, *Methane and NO Emissions from Natural Gas Stoves, Cooktops, and Ovens in Residential Homes*, 56 ENV'T SCI. & TECH. 2529 (2022).

[19] *See* Seals *et al.*, *supra* note 8, at 7.

[20] EPA Indoor Air Quality Guide, *supra* note 4.

But even with ventilation, the elimination of harmful pollutants is not possible. A 2022 National Center for Healthy Housing study monitored NO_2, $PM_{2.5}$, carbon dioxide, CO, and formaldehyde in 152 homes across Chicago and New York and found no significant reduction in NO_2 from ventilation and only 13 to 44 percent reductions in other contaminants.[21] The researchers' primary building intervention recommendation was to reduce or eliminate indoor contaminant sources and replace gas stoves with electric models.[22]

The dangers associated with gas appliances start from the delivery of the gas to those appliances and are present even when appliances are not in use. A study measuring direct methane emissions from gas stoves in homes found that more than three-quarters of those emissions occurred when the appliances were off and not in use.[23] Researchers from Harvard T.H. Chan School of Public Health have discovered chemicals in methane gas being delivered to stoves that EPA has classified as air toxics, including benzene, for which no safe level of exposure can be recommended given the genotoxicity.[24]

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[21] Nat'l Ctr. for Healthy Hous., *Studying the Optimal Ventilation for Environmental Indoor Air Quality* at 3 (Apr. 2022), https://nchh.org/resource-library/report_studying-the-optimal-ventilation-for-environmental-indoor-air-quality.pdf.

[22] *Id*. at 4.

[23] Lebel *et al.*, *supra* note 18.

[24] Genotoxicity refers to the properties of a chemical agent to damage genetic information within a cell causing mutations that lead to cancer.

But these emissions from gas appliances, which pose unacceptable health risks to millions of people, would be abated by Berkeley's ordinance and other measures that curb the use of such appliances.

II. Indoor air pollutants from methane gas appliances threaten public health.

The continued use of methane gas appliances in buildings has serious public health implications for the general population. Exposure to methane gas appliance-related pollution, including NO_2, $PM_{2.5}$, CO, benzene, and formaldehyde, has been increasingly linked to negative human health effects, including higher rates of respiratory and cardiovascular illnesses, childhood asthma, as well as reduced lung function and premature death.[25] That these pollutants are generated indoors raises even greater health concerns, given that U.S. residents spend nearly 90 percent of their time indoors.[26]

Given the robust body of scientific literature evidencing these harms, leading national health organizations are recognizing the immense public health risks

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[25] Seals *et al.*, *supra* note 8, at 12-13; Andee Krasner *et al.*, *Cooking with Gas, Household Air Pollution, and Asthma: Little Recognized Risk for Children*, 83 J. ENV'T HEALTH 8, 14 (2021).

[26] Neil E. Klepeis *et al.*, *The National Human Activity Pattern Survey (NHAPS): A Resource for Assessing Exposure to Environmental Pollutants*, 11 J. EXPOSURE ANALYSIS & ENV'T EPIDEMIOLOGY 231, 242 (2001); *see also* U.S. Env't Prot. Agency, Report to Congress on Indoor Air Quality Volume II: Assessment and Control of Indoor Air Pollution (1989), https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9100LMBU.TXT.

associated with gas appliances. In June 2022, the American Medical Association stated that it "(1) recognizes the association between the use of gas stoves, indoor nitrogen dioxide levels and asthma; (2) will inform its members and, to the extent possible, health care providers, the public, and relevant organizations that use of a gas stove increases household air pollution and the risk of childhood asthma and asthma severity; which can be mitigated by reducing the use of the gas cooking stove, using adequate ventilation, and/or using an appropriate air filter; and (3) will advocate for innovative programs to assist with mitigation of cost to encourage the transition from gas stoves to electric stoves in an equitable manner."[27] In November 2022, the American Public Health Association adopted a policy acknowledging the scientific evidence linking gas stove emissions—particularly NO_2—and negative health effects and called on various regulatory agencies and policymakers to enact a wide range of measures to abate gas appliance emissions.[28] These resolutions acknowledge the link between the use of

[27] Am. Med. Ass'n, AMA House of Delegates Report, at 16 to 17, Res. 439, A-22 (2022), https://www.ama-assn.org/system/files/a22-refcmte-d-report-annotated.pdf.

[28] Am. Pub. Health Ass'n, *Gas Stove Emissions are a Public Health Concern: Exposure to Indoor Nitrogen Dioxide Increases Risk of Illness in Children, Older Adults, and People with Underlying Health Conditions* (2022), https://www.apha.org/Policies-and-Advocacy/Public-Health-Policy-Statements/Policy-Database/2023/01/18/Gas-Stove-Emissions.

gas appliances and emissions of air pollutants that we have long known to be harmful to human health.

Nitrogen dioxide is the component of NO_x that is of greatest concern for health and is known to cause asthma-related health effects.[29] In 1971, EPA established the first national ambient air quality standard for NO_2 in recognition of the harmful health effects of NO_2 exposure.[30] EPA has acknowledged that even short-term NO_2 exposure can cause respiratory health effects, such as impaired lung function, respiratory symptoms, inflammation of the airway, and asthma exacerbations requiring hospitalization.[31] NO_2 exposure is also linked to chronic obstructive pulmonary disease, cardiovascular effects, diabetes, cancer, and reproductive harms.[32]

Carbon monoxide exposure is associated with life-threatening cardiovascular effects. CO poisoning results in 430 deaths and approximately 50,000 emergency

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[29] U.S. Env't Prot. Agency, *Fact Sheet: Review of the Primary National Ambient Air Quality Standards for Oxides of Nitrogen*, https://www.epa.gov/sites/default/files/2018-04/documents/no2_naaqs.final_action.fact_sheet_4.6.18.pdf (last visited June 9, 2023).

[30] 36 Fed. Reg. 8186 (Apr. 30, 1971).

[31] 75 Fed. Reg. 6474, 6479-80 (Feb. 9, 2010).

[32] Seals *et al.*, *supra* note 8, at 12; *see also* U.S. Env't Prot. Agency, *Integrated Science Assessment (ISA) For Oxides of Nitrogen – Health Criteria*, 1-17, 5-55 (2016) [hereinafter 2016 NOx ISA].

department visits in the United States annually.[33] In 2010, EPA concluded that short-term CO exposure can cause cardiovascular morbidity and mortality, such as heart attack, congestive heart failure, and ischemic heart disease.[34] Individuals with coronary heart disease are vulnerable to experiencing adverse health effects from even low levels of CO exposure and are more likely to be admitted to the hospital due to CO exposure.[35] CO exposure is also linked to respiratory and cardiovascular illnesses and neurological impairment.[36]

Exposure to $PM_{2.5}$ pollution has significant adverse effects on human health. Elevated $PM_{2.5}$ levels have been linked to premature mortality; heart attacks, strokes, worsening of chronic heart failure, and sudden cardiac death; impaired fetal and childhood lung function development; acute and chronic decreases in lung function; respiratory infections; respiratory emergency department visits,

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[33] Ctrs. for Disease Control & Prevention, *Carbon Monoxide Poisoning (CO)*, https://www.cdc.gov/dotw/carbonmonoxide/index.html (last visited June 9, 2023); s*ee also* Jason Rose *et al.*, *Carbon Monoxide Poisoning: Pathogenesis, Management, and Future Directions of Therapy*, 195 AM. J. RESPIRATORY & CRITICAL CARE MED. 596 (2017), https://www.atsjournals.org/doi/full/10.1164/rccm.201606-1275CI.

[34] 2016 NOx ISA, *supra* note 32. *See also* U.S. Env't Prot. Agency, *Air Quality Criteria Document for Carbon Monoxide*, at 5 (1979).

[35] Seals *et al.*, *supra* note 8, at 16 (citing *id.* at 2-10).

[36] *Id.* at 2-5.

hospitalizations, and deaths; and development and exacerbation of asthma.[37] Even "[s]hort-term exposure (from less than 1 day up to several days) to $PM_{2.5}$ is likely causally associated with mortality from cardiopulmonary diseases, increased hospitalization and emergency department visits for cardiopulmonary diseases, increased respiratory symptoms, decreased lung function, and changes in physiological indicators for cardiovascular health."[38]

Short-term exposure to benzene can lead to drowsiness, dizziness, headaches, tremors, confusion, and/or unconsciousness. Long-term exposure to benzene can lead to blood disorders, and, according to the American Cancer Society, has been linked to higher rates of cancer including leukemia and other blood cancers.[39] Considering the known dangers, the recent study showing measurable levels of benzene in delivered gas to homes highlights an urgent public health concern.[40]

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[37] 72 Fed. Reg. 20,586, 20,586-87 (Apr. 25, 2007). *See also* U.S. Env't Prot. Agency, *Health and Environmental Effects of Particulate Matter (PM): Health Effects*, https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm (last visited June 9, 2023).

[38] 72 Fed. Reg. 54,112, 54,128 (Sept. 21, 2007).

[39] Am. Cancer Soc'y, *Benzene and Cancer Risk*, https://www.cancer.org/cancer/risk-prevention/chemicals/benzene.html (last visited June 9, 2023).

[40] Michanowicz *et al.*, *supra* note 5.

The negative health effects of pollutants produced from indoor gas combustion and methane gas leaks are well-documented and alarming, and regulations and policy measures to eliminate these pollutants are critical to abate negative health outcomes.

III. Indoor and outdoor air pollution related to gas appliance usage exacerbates health risks to vulnerable populations, low-income communities, and communities of color.

Pollution from gas appliances poses severe health risks for vulnerable populations, including children, the elderly, individuals with respiratory illnesses, and communities of color who bear disproportionately greater pollution burdens. It is established that demographics, including age, ethnicity, and socioeconomic status, are correlated with disproportionate individual health risks from outdoor air pollution.[41] Those risks, in turn, are exacerbated by exposure to indoor air pollution associated with methane gas.

The link between gas stoves and childhood asthma has been well-known in the public health community for almost three decades. Over thirty years ago, a 1992 study found that children exposed to higher levels of indoor NO_2—at an increment "comparable to the increase resulting from exposure to a gas stove"—

[41] Am. Lung Ass'n, *State of the Air: Populations at Risk*, https://www.lung.org/research/sota/key-findings/people-at-risk (last visited June 9, 2023).

had an elevated risk of respiratory illness.[42] More recently, a 2013 meta-analysis of 41 studies spanning 36 years of research demonstrated that children living in homes with gas stoves had a 42 percent higher risk of experiencing asthma symptoms and, over their lifetime, a 24 percent increase in the risk of being diagnosed with asthma.[43] Children aged four and under who are exposed to indoor nitrogen dioxide from gas appliances are also more likely to experience impaired cognitive function and are at greater risk of developing attention deficit or hyperactivity disorder symptoms.[44] In 2016, EPA determined that there is a causal relationship between short-term exposure to NO_2 and respiratory effects and likely a causal relationship between long-term exposure to NO_2 and the development of asthma in children.[45] In so concluding, EPA reviewed studies that showed even small increases in short-term exposure to indoor NO_2—such as exposure generated from indoor gas stove use—can increase asthma risks for children.[46]

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[42] Vic Hasselblad *et al.*, *Synthesis of Environmental Evidence: Nitrogen Dioxide Epidemiology Studies*, 42 J. AIR & WASTE MGMT. ASS'N 662-71, 662 (1992).

[43] Lin *et al.*, *supra* note 3.

[44] Seals *et al.*, *supra* note 8, at 13 (citing Eva Morales *et al.*, *Association of Early-life Exposure to Household Gas Appliances and Indoor Nitrogen Dioxide With Cognition and Attention Behavior in Preschoolers*, 169 AM. J. EPIDEMIOLOGY 1327 (2009)).

[45] 2016 NOx ISA, *supra* note 32, at lxxxii, tbl. ES-1.

[46] Seals *et al.*, *supra* note 8, at 12 (citing Kathleen Belanger *et al.*, *Household Levels of Nitrogen Dioxide and Pediatric Asthma Severity*, 24 EPIDEMIOLOGY 320 (2013)).

Other vulnerable populations, such as the elderly and individuals with existing respiratory illnesses such as asthma, cardiovascular disease, or chronic obstructive pulmonary disease, also experience greater adverse health effects from indoor air pollution. For adults with asthma, NO_2 exposures not much higher than peak outdoor 1-hour concentrations can exacerbate symptoms.[47] This is particularly troubling considering that gas stoves and ovens can produce levels of NO_2 exceeding the legally acceptable outdoor 1-hour concentration limit within a matter of minutes.[48] A study published in 2021 concluded that elderly adults who experience long-term exposure to even low concentrations of $PM_{2.5}$ and NO_2 are at increased risk for pneumonia, stroke, and cardiovascular conditions.[49]

Throughout the United States, minoritized and low-income communities bear disproportionate pollution burdens and are more likely to live in areas with high levels of air pollution.[50] Communities forced to breathe these elevated levels of pollution face serious health consequences, and one study has estimated that

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[47] Seals *et al.*, *supra* note 8, at 12 (citing 2016 NOx ISA, *supra* note 32, at 1-18, 1-31, 5-240).

[48] Lebel *et al.*, *supra* note 18.

[49] Mahdieh D. Yazdi *et al.*, *Long-Term Association of Air Pollution and Hospital Admissions Among Medicare Participants Using a Doubly Robust Additive Model*, 143 CIRCULATION 1584 (2021).

[50] Lara P. Clark *et al.*, *National Patterns in Environmental Justice and Inequality: Outdoor NO_2 Air Pollution in the United States*, 9 PLOS ONE e94431 (2014).

reducing NO_2 exposures of non-white individuals to levels experienced by white individuals would reduce ischemic heart disease mortality by around 7,000 deaths per year.[51]

Another recent study showed that communities of color, regardless of income, are also exposed to outdoor $PM_{2.5}$ pollution from a variety of sources, including power plants, industrial facilities, agricultural activities, vehicles, and residential gas combustion.[52] This research also showed that the relative disparity in exposure to outdoor $PM_{2.5}$ caused by residential gas combustion is among the largest, where people of color are exposed to almost twice as much $PM_{2.5}$ than white individuals.[53] Indeed, residential gas combustion showed the highest relative racial-ethnic disparity of the 14 source categories studied—more than power plants, vehicles, and industrial sources.[54]

Housing conditions in low-income communities contribute to socioeconomic disparities in household exposure to indoor air pollution. For example, smaller units, higher occupant density, and inadequate ventilation all contribute to higher

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[51] *Id.*

[52] Christopher W. Tessum *et al.*, *PM2.5 Polluters Disproportionately and Systemically Affect People of Color in the United States*, 7 SCI. ADVANCES eabf4491 (2021), https://www.science.org/doi/10.1126/sciadv.abf4491.

[53] *Id.* at 1, supplementary data file S2.

[54] Dennison *et al.*, *supra* note 7.

levels of NO_2 in lower-income multifamily buildings.[55] The 2022 study by the National Center for Healthy Housing revealed that 90% of rental homes did not have adequate ventilation,[56] and another study showed that gas stove pollution was highest in multi-unit buildings.[57] As noted above, increased levels of NO_2 exposure can lead to cardiovascular effects, diabetes, cancer, reproductive harms,[58] and lung illnesses that are exacerbated by indoor air pollution.

These public health disparities highlight the need for the wide range of targeted policies that the Panel's opinion would frustrate. Maintaining the Panel's reasoning would strip regulators and policymakers of the necessary tools to adopt policies to address the health risks to vulnerable populations exacerbated by the use of gas appliances indoors.

CONCLUSION

The Court should grant rehearing *en banc* to correct an overbroad interpretation of EPCA that will stifle efforts to abate public health harms across

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[55] Seals *et al.*, *supra* note 8 at 14 (citing Gary Adamkiewicz *et al.*, *Moving Environmental Justice Indoors: Understanding Structural Influences on Residential Exposure Patterns in Low-Income Communities*, 101 AM. J. PUB. HEALTH 238 (2011)).

[56] Nat'l Ctr. for Healthy Hous., *supra* note 21, at 3.

[57] Lisa K. Baxter *et al.*, *Predictors of Concentrations of Nitrogen Dioxide, Fine Particulate Matter, and Particle Constituents Inside of Lower Socioeconomic Status Urban Homes*, 17 J. EXPOSURE SCI & ENV'T EPIDEMIOLOGY 433 (2007).

[58] Seals *et al.*, *supra* note 8, at 12.

the country. Reducing methane gas end uses in buildings is a critical public health issue, and policymakers responsible for safeguarding human health and welfare must have access to the widest range of regulatory tools available to curtail the adverse health effects associated with gas appliances. The City of Berkeley's ordinance ending gas hookups in new buildings and other local and state policies limiting gas use in buildings are effective measures to reduce indoor air pollution and eliminate the unacceptable health risks that stem from the use of methane gas appliances.

For the foregoing reasons, *amici* support Defendant-Appellee's request that the Court grant the petition for rehearing *en banc*.

Dated: June 12, 2023

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CERTIFICATE OF COMPLIANCE

I certify that pursuant to Circuit Rule 35-4 and 40-1, this brief of amicus curiae is prepared in a format, typeface, and type style that complies with Fed. R. App. P. 32(a)(4)-(6) and contains 4,031 words.

Dated: June 12, 2023

/s/ *Timothy R. Oberleiton*
TIMOTHY R. OBERLEITON

CERTIFICATE OF SERVICE

I certify that on June 12, 2023, I electronically filed the foregoing document with the Clerk of the Court of the United States Court of Appeals for the Ninth Circuit by using the appellate CM/ECF system. I certify that all other participants in this case are registered CM/ECF users and that service will be accomplished by the appellate CM/ECF system.

Dated: June 12, 2023

/s/ *Timothy R. Oberleiton*
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