U.S. Department of Housing and Urban Development
451 7th St. SW
Washington, D.C., 20410-0500

Adoption of Energy Efficiency Standards for New Construction of HUD- and USDA-Financed Housing: Preliminary Determination
Docket FR–6271–N–01
August 7, 2023

Thank you for the opportunity to comment on the preliminary determination to update energy efficiency requirements for federally financed housing. The below organizations, representing health-based nonprofits and societies support the determination and urge you to adopt it quickly. We also urge you to adopt subsequent codes to ensure that future new construction of Housing and Urban Development (HUD) and United States Department of Agriculture (USDA)-backed homes prioritize the health of inhabitants through the phase out of combustion fueled and other inefficient appliances.

HUD and USDA programs subsidize 73% of US housing units considered affordable to extremely low-income residents[1] with about two-thirds of residents identifying as Black, Indigenous or other people of color.[2] The government has a unique opportunity to protect the health of hundreds of thousands of people through the adoption of building codes that prioritize safe, healthy, and efficient living spaces.

The proposed standards will improve efficiency and reduce emissions over current codes
The agencies' potential adoption of the 2021 IECC and ASHRAE 90.1-2019 ("proposed standards") constitute a meaningful step toward greater energy affordability and healthy buildings. The proposed standards are the minimum acceptable improvement for this code update. The published preliminary determination states that $1.19 billion could be saved over the life cycle of units built during the first year following adoption of the proposed codes, considering both first cost and utility cost changes.[3] In the 18 states whose current local codes are equivalent to or less stringent than the proposed update, energy costs and greenhouse gas emissions associated with new units will fall by as much as 33% if the proposed codes are adopted. In states whose outdated single-family and low-rise codes do not exceed IECC 2009, the proposed codes would result in energy savings of up to 27%. Beyond emissions reductions, requiring these improvements in building tightness, ventilation, and insulation requirements will yield more comfortable and healthy homes for residents.

[1] HUD Office of Policy Development and Research. "Picture of Subsidized Households." Available at: https://www.huduser.gov/portal/datasets/assthsg.html
[2] National Low Income Housing Coalition. "The Gap: A Shortage of Affordable Homes." Available at https://nlihc.org/sites/default/files/gap/Gap-Report_2023.pdf
[3] Adoption of Energy Efficiency Standards for New Construction of HUD- and USDA-Financed Housing: Preliminary Determination and Solicitation of Comment; 88 FR 31774, May 18, 2023

Adopt zero-emission codes as soon as possible
Though the new proposed standards are more protective of health than current ones, they still allow for the use of combustion in the home. A zero-combustion, all electric standard is far more protective of health and should be considered and adopted as soon as feasible.

Health impacts of in-home combustion use
All-electric homes that are highly efficient have proven health benefits. Gas, propane and wood burning appliances such as stoves, water heaters, furnaces, fireplaces, and clothing dryers emit combustion pollutants and contribute to both indoor and outdoor air pollution when the pollution migrates outside.

A significant amount of evidence on the detrimental health effects of exposure to air pollution shows that burned methane gas byproducts such as nitrogen dioxide contribute to premature mortality[4] and increased risk for illness including ischemic heart disease, stroke, COPD, lung cancer, type 2 diabetes, and lower-respiratory infections.[5] There is a growing body of evidence showing an association between long-term exposure to air pollution and adverse birth outcomes. Short term exposure to high levels of air pollution can exacerbate asthma and cardiopulmonary symptoms.[6]

When methane gas and wood are burned, they produce carbon monoxide and particulate matter, which impact the heart. Carbon monoxide is a harmful air pollutant that can cause headache, fatigue, and death.[7] When inhaled, $PM_{2.5}$ penetrates deep in the lungs which sets off a cascade of inflammatory reactions in the body. These reactions affect proper heart function and can cause arrhythmia and increase the risk of heart attacks.

Methane and wood burning also produces nitrogen dioxide (NO_2). The relationship between both short-term and long-term nitrogen dioxide exposure and the development of childhood asthma is well-documented.[8] This is of particular importance for low income and people of color who live in federally financed housing. Black people face the highest risk of asthma and

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[4]Singer BC, Pass RZ, Delp WW, Lorenzetti DM, Maddalena RL. Pollutant concentrations and emission rates from natural gas cooking burners without and with range hood exhaust in nine California homes. *Building and Environment*. 2017;122:215-229. doi:10.1016/j.buildenv.2017.06.021
[5]Roda C, Kousignian I, Guihenneuc-Jouyaux C, et al. Formaldehyde Exposure and Lower Respiratory Infections in Infants: Findings from the PARIS Cohort Study. *Environmental Health Perspectives*. 2011;119(11):1653-1658. doi:10.1289/ehp.1003222
[6] Tiotiu AI, Novakova P, Nedeva D, Chong-Neto HJ, Novakova S, Steiropoulos P, Kowal K. *Impact of Air Pollution on Asthma Outcomes*. Int J Environ Res Public Health. 2020 Aug 27;17(17):6212.
[7]United States Environmental Protection Agency. *Carbon Monoxide's Impact on Indoor Air Quality*. July 31, 2014. available at: https://www.epa.gov/indoor-air-quality-iaq/carbon-monoxides-impact-indoor-air-quality
[8]*Integrated Science Assessment (ISA) For Oxides of Nitrogen – Health Criteria* (Final Report, 2016). US Environmental Protection Agency, Washington, DC, EPA/600/R-15/068, 2016, Table ES-1, p. Lxxxii, https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=310879.

higher mortality rates from asthma[9] and are at higher risk of asthma exacerbation and respiratory symptoms from methane gas pollution due to often living in historically disinvested communities with higher levels of ambient outdoor air pollution and poorly maintained housing stock and building appliances.[10] Factors including smaller unit size, more people inside the home and inadequate stovetop ventilation can also contribute to elevated concentrations of $NO_2$and other pollutants in lower-income multifamily buildings.[11] Reducing residents' exposure to these byproducts, therefore, is important for mitigating the disparate health impacts seen in the United States.

Home-based combustion impacts on outdoor pollution

Venting appliances to the outside mitigates some of the potential health impact of exposure indoors. However, emissions stay within the atmosphere and contribute to the health impacts of outdoor air pollution and to climate change. Residential and commercial emissions made up 13% of total U.S. global warming emissions in 2020, mostly from natural gas and heating oil.[12] In smaller and more rural places, woodsmoke from indoor burning contributes substantially to the local air pollution and can greatly increase the amount of particulate matter in the area.

More research is needed to know exactly how indoor air pollution is contributing to the outdoor environment but known impacts of the types of pollutants emitted demonstrate a need to reduce these emissions beyond simply expelling them from our houses. We know from research done over the last 50 years that exposure to air pollutants such as PM, ozone, NOx, carbon monoxide and air toxics contribute to premature mortality and increased risk of illness in children and adults, including heart disease and stroke, asthma, COPD, lung cancer, type 2 diabetes, premature birth and respiratory infection. [13, 14]

Overall, we appreciate the Departments' recommendation to implement 2021 IECC and ASHRAE 90.1-2019 which will improve health and save emissions without impacting availability of affordable housing across the country. We support HUD and USDA adopting the proposed determination and urgently implore them to do so without further delay. Further, we

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[9] Centers for Disease Control. Asthma Surveillance. September 2021. https://stacks.cdc.gov/view/cdc/109086

[10]Hansel NN, Breysse PN, McCormack MC, et al. A Longitudinal Study of Indoor Nitrogen Dioxide Levels and Respiratory Symptoms in Inner-City Children with Asthma. *Environmental Health Perspectives*. 2008;116(10):1428-1432. doi:10.1289/ehp.11349

[11] Adamkiewicz G, Zota AR, Fabian MP, et al. Moving environmental justice indoors: understanding structural influences on residential exposure patterns in low-income communities. Am J Public Health. 2011; 101 Suppl 1 (Suppl 1):S238-S245. doi:10.2105/AJPH.2011.300119

[12] United States Environmental Protection Agency, Total U.S. Greenhouse Gas Emissions by Economic Sector in 2021 available at https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

[13] Uzoigwe JC, Prum T, Bresnahan E, Garelnabi M. The emerging role of outdoor and indoor air pollution in cardiovascular disease. N Am J Med Sci. 2013 Aug;5(8):445-53. doi: 10.4103/1947-2714.117290. PMID: 24083218; PMCID: PMC3784920.

[14] Manisalidis I, Stavropoulou E, Stavropoulos A, Bezirtzoglou E. Environmental and Health Impacts of Air Pollution: A Review. Front Public Health. 2020 Feb 20;8:14

recommend that the Departments act swiftly following this update to assess and adopt more proactive codes that require highly efficient, all-electric new construction.

Sincerely,

Allergy & Asthma Network
American Lung Association
American Public Health Association
American Thoracic Society
Asthma and Allergy Foundation of America
Children's Environmental Health Network
Medical Society Consortium on Climate and Health
Medical Students for a Sustainable Future
National Environmental Health Association
National Medical Association
Physicians for Social Responsibility