

Colliding Crises

The Dangers of Extreme Heat in Affordable Housing

HIGHLIGHTS

The housing crisis and climate change–fueled extreme heat are increasingly colliding. Among those at greatest risk: people living in affordable housing, many of whom have the lowest incomes, are older, or live with disabilities.

To assess this risk, the Union of Concerned Scientists analyzed the exposure of affordable housing to county-level National Weather Service heat alerts in 2024 across the United States, Puerto Rico, and the Virgin Islands. We found that people living in affordable housing experienced several days’ to several weeks’ worth of heat alerts each year, with households headed by people of color facing disproportionately high risks. The largest shares of affordable housing exposed are in the Northeast and Southeast, with Texas, California, and New York leading in total numbers of homes exposed.

In order to protect people, UCS recommends increasing investments to make both new and upgraded affordable housing resilient to climate change—particularly extreme heat. A robust Low-Income Home Energy Assistance Program that expands access to both energy-efficient cooling and broader building efficiency upgrades is essential, as are steps to ensure state and local support for heat protections and affordable housing.

The United States is in the midst of a housing crisis, one that most acutely affects families and individuals living with low incomes. Simultaneously, the climate crisis is heightening the frequency and severity of extreme heat and will continue to worsen as long as heat-trapping emissions rise (Dahl et al. 2019). This combination exposes many people who live in affordable housing serving low-income families to increasingly unhealthy, even dangerous, conditions. As policymakers grapple with the shortfall in affordable housing, it is crucial that they gear investments in upgrading and expanding the housing stock toward making it more resilient to climate extremes.

To inform policy decisions at the intersection of climate, health, and housing, the Union of Concerned Scientists (UCS) analyzed the exposure of a subset of the existing stock of affordable housing across the nation—and the people who live in these homes—to extreme heat. The analysis, based on heat alerts from the National Weather Service (NWS) in 2024, the hottest year on record (NOAA 2025), led to recommendations on how to make existing and new affordable housing safer, more heat-resilient, and more energy efficient.

The Housing and Climate Crises Compound Long-Standing Racial and Socioeconomic Disparities

Across the nation, the climate crisis increasingly collides with the long-standing crisis in affordable housing. This amplifies the harms for people with the fewest resources, including residents of both subsidized and unsubsidized affordable housing who are living on low and very low incomes.¹

Socioeconomic disadvantages—low incomes, substandard housing, limited access to cooling amenities—can amplify heat-related illness or death risks (Harlan et al. 2013; Declet-Barreto et al. 2025), especially for people of advanced age, with preexisting health conditions, or acutely exposed to intense heat (Harlan et al. 2019). As climate-driven extreme heat worsens, it puts the residents of these homes at increased risk of heat stroke, cardiovascular, kidney, respiratory disorders, and much more, including death (CDC 2024a).

Renters with the lowest incomes often lack safe housing options because the United States has underinvested in building and maintaining affordable housing for decades. The result is a significant shortfall in housing for the people with the lowest incomes. Currently, the nation has about 34.2 million rental housing units, including public housing and manufactured homes, that are considered affordable for people with low incomes (Harati et al. 2025). Of the 34.2 million units, however, only 3.8 million are *affordable* and *available* for the 10.9 million extremely low-income households, a shortfall of 7.1 million homes (Harati et al. 2025).²

Often, affordable housing units are located where there is little shade. Many are old, built to outdated standards, and are not sufficiently energy efficient or protective against heat. For example, public housing units in urban areas are often in places with few if any trees and that are paved with heat-absorbing asphalt and concrete. This exposes residents to what is known as the “urban heat island effect”—the phenomenon of built environments and paved areas absorbing and radiating heat. That effect amplifies urban heat and elevates both daytime and nighttime temperatures relative to surrounding areas (EPA 2025). Manufactured and subsidized housing are also often in the hottest neighborhoods (Gabbe and Pierce 2020; 2024). Based on FEMA’s National Risk Index and compared with owner-occupied and renter-occupied homes, federally assisted rental homes are at a disproportionately high risk of the greatest expected losses from hazards like heat waves (Aurand et al. 2023). As the climate warms and urban development expands, premature deaths could be attributed to heat islands (Lungman et al. 2023).

A further important factor is insufficient access to central air conditioning in affordable housing. Even when central or window air conditioning is available, the cost of running it may be prohibitive for residents with low incomes. Moreover, older manufactured homes are not well-designed to keep summer heat out, creating overheating and requiring greater—and costlier—use of air conditioning (Curran-Groome et al. 2025; Gabbe et al. 2025). Residents of manufactured housing are also more likely to have lower incomes. Many are older adults constrained by fixed incomes, and therefore more likely to keep their homes at unhealthily high temperatures, which can lead to the need for heat-related medical attention (Gabbe and Pierce 2024).

Across the nation, the residents of about one in four households face “energy insecurity”—meaning they cannot afford their utility bills or are forced to keep their homes at unsafe temperatures (EIA 2020). Compounding that challenge, energy-insecure households pay more for energy than other households in absolute terms (EIA 2023).

Within US counties, census tracts with predominantly Black, Hispanic, and Asian populations living with low incomes are hotter than tracts with predominantly higher-income, non-Hispanic White populations (Benz and Burney 2021). In addition, the legacy of “redlining” puts present-day people of color at significantly higher risk of urban heat (Hoffman, Shandas, and Pendleton 2020). Historically, redlining was the practice of racial discrimination in the home-loan and insurance markets, a practice long supported by deliberate government policies.

In cities, Black and Hispanic households in general, as well as other low-income households, are less likely to have air conditioning than White or higher-income households (Scott et al. 2025). Air conditioning is the strongest protection against extreme heat (CDC 2024b), yet the federal government does not require it in public housing.³ This heightens the barriers to installing and using air conditioning for energy-burdened, low-income communities (Kelly, Marquez, and Smith 2024). As of 2025, only 23 states have requested dedicated cooling assistance from the Low-Income Home Energy Assistance Program (LIHEAP) (Declet-Barreto 2025; LIHEAP n.d.). This federally funded program helps low-income households pay their home heating and cooling bills.

Many people living in affordable housing have characteristics that make them particularly vulnerable to the increasingly frequent and severe heat caused by climate change (Harlan et al. 2019; Gabbe and Pierce 2020; Williams et al. 2019; Tsoulou et al. 2020). For example, many affordable housing residents are children and older adults, and many residents live with disabilities or preexisting health conditions.⁴

Exacerbating heat risks are gaps in landlord-tenant laws, housing markets, and government policies and programs. For example, all of these frequently exclude manufactured housing from tools used to protect people in other housing contexts (Kear et al. 2023).

Nevertheless, manufactured housing remains one of the most affordable housing options. It plays a critical role in addressing today’s crisis in affordable housing—and could play a larger, more beneficial role in the future if homes were built to meet strong resiliency standards and located in places less exposed to extreme heat.

Analyzing the Exposure of Affordable Housing to Extreme Heat

The UCS analysis assessed how many affordable homes were exposed to extreme heat in 2024 and how many times those homes were exposed. We analyzed nearly eight million affordable homes in key portions of the affordable housing market: subsidized public housing and project-based subsidized housing, manufactured housing, and homes subsidized through the Low-Income Housing Tax Credit (LIHTC) program (Box 1).⁵ For LIHTC and manufactured homes, resident counts were not available for our study. We conservatively assumed that at least one person lived in each of these units. The four home types in our study provided shelter for at least 9.2 million people.

UCS assessed exposure to extreme heat using county-level data on heat alerts issued nationwide by the National Weather Service. These data are part of the UCS 2024 Danger Season tracker (UCS n.d.). Local NWS Weather Forecasting Offices issue heat warnings when extremely dangerous heat conditions occur or are expected (NWS n.d.). The UCS Danger Season tracker provides daily updates for counties (including what the US Census Bureau terms county equivalents) on several types of extreme weather alerts between May and October every year. This is the period when climate-fueled extreme weather is most active and dangerous in the United States.

We cross-referenced the annual frequency of heat alerts in the 2024 Danger Season with the county locations of affordable housing, generating summary frequencies of all homes analyzed. For a subset of the data for which sociodemographic data were available, we summarized the characteristics of the residents of public housing and project-based subsidized housing (3.69 million people across 2.35 million homes). The analysis included the 48 conterminous states plus Puerto Rico and the US Virgin Islands; Alaska and Hawai'i did not experience heat alerts in the 2024 Danger Season.

To assess heat exposure during the 2024 Danger Season, we used two threshold frequencies:

- *One or more weeks' worth of heat alerts:* The number of affordable homes in counties that experienced at least seven heat alerts.
- *Three or more weeks' worth of heat alerts:* The number that experienced at least 21 heat alerts.

In May to October 2024, 70 percent of US counties and county equivalents experienced one or more weeks' worth of heat alerts. These thresholds enabled us to capture levels of heat exposure that reflected the experiences of many people in 2024. We captured repeated (i.e., multiple non-consecutive events) though not necessarily prolonged (i.e., lasting multiple consecutive days) exposure to extreme heat events. We did not assume that alerts were consecutive. *See the Technical Appendix for additional information on the methodology.*

Box 1. The Types of Affordable Housing Studied



Public Housing: Publicly owned rental housing for low-income households. It is federally subsidized and managed by housing authorities. The United States has about 872,000 such homes, housing 1.54 million people.



Project-Based Subsidized Housing: Privately owned and managed rental housing subsidized through a contract between property owners and the US Department of Housing and Urban Development (HUD). Tenants pay a set percentage of their income as rent. The United States has about 1.48 million such homes, housing 2.14 million people.



Manufactured Housing: Factory-built housing developed without government subsidy. This analysis included about 1.93 million such buildings nationwide. We conservatively assumed an occupancy rate of at least one person per home.



Low-Income Housing Tax Credit Housing: Privately developed and managed apartments in which a federal tax credit reduces construction, acquisition, or rehabilitation costs in exchange for 15 to 30 years of rent restrictions. The United States has about 3.61 million such homes. We conservatively assumed an occupancy rate of at least one person per home.

Findings: The Threat of Extreme Heat to Affordable Housing Residents Nationwide

UCS found that affordable homes and their residents faced repeated exposure to extreme heat during the 2024 Danger Season. The risks were widespread across every region of the country, in nearly every state and territory, and in both urban and rural areas. Households headed by people of color faced disproportionate risks, even accounting for their overrepresentation in public and project-based housing.

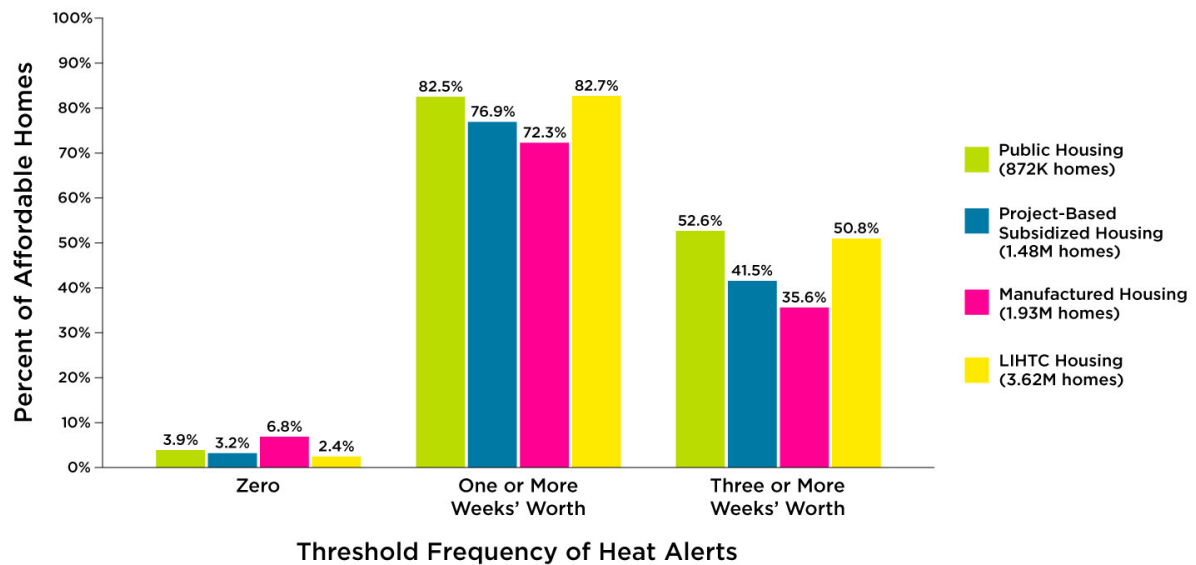
Most affordable housing experienced one or more weeks' worth of heat alerts. Nearly half experienced three or more weeks' worth of heat-alert days.

Across the nation, 6,226,965 affordable homes (79.1 percent of the total in our analysis) were located in counties that experienced *one or more weeks' worth of extreme heat days* between May and October 2024. These homes housed at least 7,377,193 people (79.3 percent of people living in affordable housing).

Across the nation, 3,588,964 affordable homes (45.6 percent) were in counties that experienced the equivalent of *three or more weeks' worth of heat alerts* between May and October 2024. This included at least 4,290,010 people living in affordable housing (46.1 percent of people living in affordable housing).

In a breakdown by affordable home type, about three-quarters of both project-based and manufactured homes were exposed to one or more weeks' worth of heat alerts; nearly 83 percent of both public housing and LIHTC homes were exposed to the same frequency of heat alerts (Figure 1). Some 35.6 percent of manufactured homes, 41.5 percent of project-based subsidized homes, and a little more than half of public housing and of LIHTC homes were exposed to three or more weeks' worth of heat alerts. Small percentages of affordable homes were not exposed to any heat alerts.

Figure 1. Exposure to Heat Alerts in Affordable Housing During 2024 Danger Season



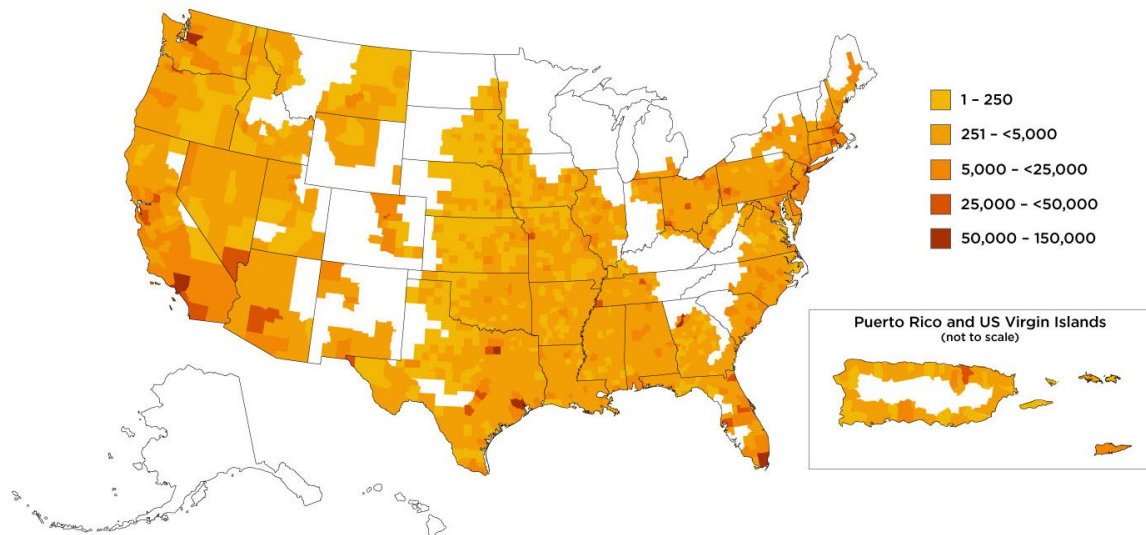
Across the country, most affordable housing experienced one or more weeks' worth of heat alerts. Nearly half of affordable housing experienced three or more weeks' worth of heat alert days. Very few affordable homes were under zero heat alerts during the 2024 Danger Season.

Note: The homes in the "one or more weeks' worth of alerts" frequency threshold also includes all homes in the "three or more weeks' worth of alerts" frequency threshold, such that the percentages for each housing category across frequency thresholds do not add up to 100.

Major metropolitan areas account for about one-third of all the affordable housing exposed to one or more weeks' worth of heat alerts. Thousands of counties in less densely populated areas account for about two-thirds.

UCS found widespread exposure to one or more weeks' worth of heat alerts in affordable homes throughout the country, except in Alaska, Hawai'i, and Wisconsin (Figure 2). Counties (or equivalents) with large numbers of affordable homes exposed to one or more weeks' worth of heat alerts (25,000 to 151,000 homes per county) are in metropolitan areas, reflecting the high number of people and affordable homes under heat alerts there. This amounts to 2,046,682 affordable homes across 42 counties, or 32.9 percent of exposed affordable homes. Counties or equivalents with fewer than 25,000 affordable homes have a total of 4,180,283 such homes (67.1 percent of exposed affordable homes), spread across 3,181 counties in less densely populated areas of the country.⁶

Figure 2. Number of Affordable Homes in Counties* That Experienced One or More Weeks' Worth of Heat Alerts During 2024 Danger Season



Counties with 25,000 to 150,000 affordable homes exposed to one or more weeks' worth of heat alerts are located in metropolitan areas across the country. Counties with fewer than 25,000 affordable homes exposed to one or more weeks' worth of heat alerts are spread across counties in less densely populated areas. Alaska and Hawai'i had no heat alerts during the 2024 Danger Season; the remaining blank areas in the map experienced less than one week's worth of heat alerts.

*Note: *Or county equivalents*

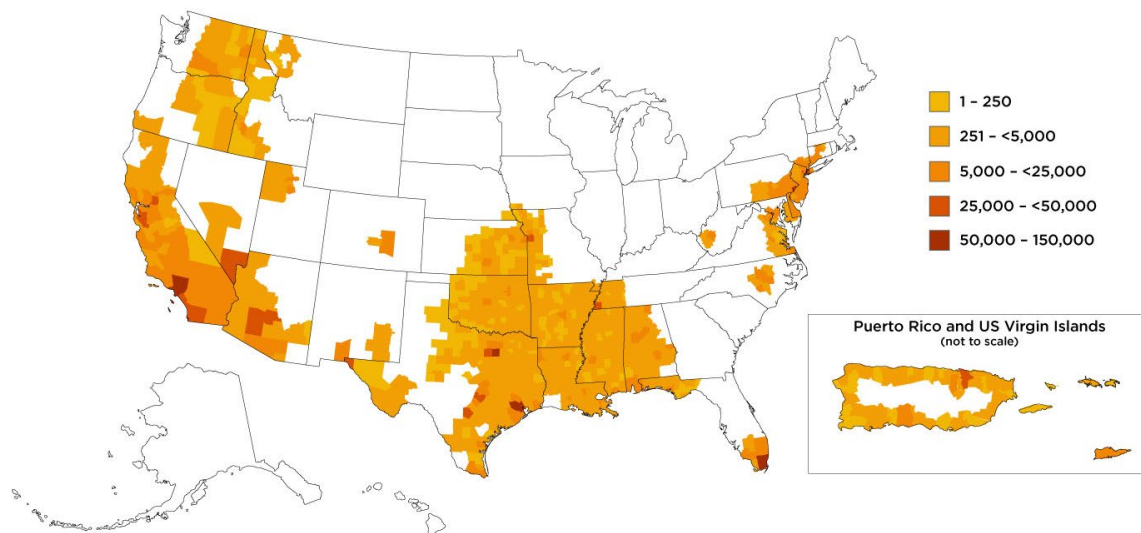
In every region, residents of affordable housing are exposed to heat alerts.

The states with the most affordable homes exposed to one or more weeks' worth of heat alerts are Texas (600,907 homes), New York (583,599 homes), California (564,673 homes), Florida (321,147 homes), and Ohio (331,442 homes) (Figure 2).

Exposure to three or more weeks' worth of heat alerts in affordable homes covers 34 states and includes large metropolitan areas across the country (Figure 3). The states with the largest numbers of affordable homes exposed to three or more weeks' worth of alerts are Texas (567,886 homes), California (530,361 homes), New York (498,084 homes), New Jersey (212,842 homes), and Louisiana (156,404 homes).

In 36 states or territories, at least 75 percent of all affordable homes suffered one or more weeks' worth of alerts. In 15 states or territories, at least 75 percent of all affordable homes were exposed to three or more weeks' worth of heat alerts.

Figure 3. Number of Affordable Homes in Counties* That Experienced Three or More Weeks' Worth of Heat Alerts During 2024 Danger Season



The largest numbers of affordable homes exposed to three or more weeks' worth of heat alerts are in Texas, California, New Jersey, New York, and Louisiana. Alaska or Hawai'i had no heat alerts during the 2024 Danger Season; the remaining blank areas in the map experienced less than one week's worth of heat alerts.

*Note: *Or county equivalents*

The Northeast and the Southeast each contain about one quarter of the nation's affordable housing stock that was exposed to one or more weeks' worth of heat alerts. These represent the largest shares among all regions.

Two regions had the largest shares of all affordable housing exposed to one or more weeks' worth of alerts: the Northeast at 27.3 percent and the Southeast at 26.1 percent (Table 1). This was also reflected for two housing types in the Northeast: this region had the largest share of exposed homes in public housing (45.3 percent; 326,131 homes) and project-based housing (35.3 percent; 401,270 homes). The Southeast had the largest share of exposed manufactured homes (33.6 percent; 469,091 homes) and LIHTC homes (25.4 percent; 757,027 homes). The Northeast came in a close second in terms of the percentage of LIHTC homes exposed (24.9 percent; 740,687 homes).

Public housing represented the largest share of exposed affordable homes in the US Caribbean (Puerto Rico and the US Virgin Islands at 6.9 percent or 49,302 homes). LIHTC and project-based subsidized housing each accounted for less than 2 percent of all exposed affordable homes (32,078 homes in total). There are no manufactured homes in Puerto Rico and the US Virgin Islands in the data.

Table 1. Number of Affordable Homes That Experienced One or More Weeks' Worth of Heat Alerts During 2024 Danger Season

Region	Public Housing	Project-Based Subsidized Housing	Manufactured Housing	LIHTC Housing	All Affordable Housing
Midwest	78,746 (11.0%)	165,704 (14.6%)	220,321 (15.8%)	290,147 (9.8%)	755,018 (12.1%)
Northeast	326,131 (45.3%)	401,270 (35.3%)	231,165 (16.6%)	740,687 (24.9%)	1,699,253 (27.3%)
Northern Great Plains	7,892 (1.1%)	15,354 (1.3%)	38,702 (2.8%)	36,217 (1.2%)	98,165 (1.6%)
Northwest	13,264 (1.85%)	34,023 (3.0%)	54,767 (3.9%)	176,256 (5.9%)	278,310 (4.5%)
Southeast	151,331 (21.0%)	250,559 (22.0%)	469,091 (33.6%)	757,027 (25.4%)	1,628,008 (26.1%)
Southern Great Plains	55,926 (7.8%)	92,329 (8.1%)	238,263 (17.1%)	391,017 (13.1%)	777,535 (12.5%)
Southwest	36,894 (5.1%)	159,597 (14.0%)	141,877 (10.2%)	570,928 (19.2%)	909,296 (14.6%)
US Caribbean	49,302 (6.9%)	18,573 (1.6%)	0 (0%)	13,505 (0.5%)	81,380 (1.3%)

Two regions had the largest shares of all affordable housing exposed to one or more weeks' worth of heat alerts: the Northeast at 27.3 percent and the Southeast at 26.1 percent

A person of color heads about half of all households in public and project-based housing developments that experienced one or more weeks' worth of heat alerts. Using a higher threshold of three or more weeks' worth of heat alerts, this fraction increases to two-thirds of households in public and project-based affordable housing.

A person of color headed about 52 percent of households in public housing and project-based housing (HUD 2024). By comparison, a person of color headed about 34 percent of all US households (US Census Bureau 2024), suggesting that households led by people of color were highly overrepresented in these two types of affordable housing.

Our analysis showed that people of color faced disproportionate risks of exposure to heat, even accounting for their overrepresentation in public and project-based housing. On average nationally, a person of color headed 66 percent of households in public and project-based housing developments that experienced three or more weeks' worth of heat alerts.

The top five states or territories in this heat-alert-exposure category and with the largest percentages of households in public and project-based housing led by a person of color were: Puerto Rico (98.9 percent), District of Columbia (95.7 percent), the US Virgin Islands (94.9 percent), Florida (84.7 percent), and New York (83.2). The largest racial or ethnic category exposed to each heat-alert category was Black households (39.7 percent exposed to one or more weeks' worth and 41.5 percent exposed to three or more weeks' worth of heat alerts). ⁷

Recommendations

With climate-driven extreme heat on the rise, policymakers at every level must take action to increase the resilience of homes and protect people's health. Effective solutions will require robust funding, coordination across federal, state, and local decisionmakers, and equitable, science-based implementation at the state and local levels.

Among the largest sources of federal funding for preserving, upgrading and building affordable housing are the Low-Income Housing Tax Credit (LIHTC), which the Treasury Department allocates to states and territories, and the HOME Investment Partnerships (HOME) and the Community Development Block Grant (CDBG) programs, both of which the Department of Housing and Urban Development administers (Keightley 2025). State and local housing trust funds provide additional funding. Federal and state housing voucher programs, by paying a portion of tenants' rent, help low-income households afford units in the private housing market.

Historical funding levels and financing thresholds for this patchwork of programs have been vastly insufficient to meet the need for affordable and available housing. *We recommend that **federal, state, and local policymakers** work together to:*

- Increase investments in upgrading existing and building new affordable homes to be more resilient to heat. This includes investing in improving energy efficiency by implementing the latest building codes and standards. Such investments will better protect people's health and safety, help lower their energy bills, and are a smart use of taxpayer funds. Crucial is a deliberate emphasis on meaningful affordability—ensuring that homes are actually affordable for families living on the lowest incomes, not just families living with middle incomes.
- Ensure that federal housing funds allocated following disasters through HUD's CDBG-DR and other programs are invested in climate-resilient ways. This will make the housing stock in highly exposed places safer from future disasters and chronic climate stressors like extreme heat.

Providing access to energy-efficient cooling and broad efficiency upgrades in homes is especially important in a warming world. Low-income households face specific challenges because residents may be unable to afford the costs of cooling, which can lead to deadly outcomes during extreme heat events.

To address this, we recommend that **federal policymakers** bolster, expand, and reform the Department of Health and Human Services' Low-Income Home Energy Assistance Program and the Department of Energy's Weatherization Assistance Program to better support households living with low incomes and extreme heat:

- Boost LIHEAP funding and ensure robust annual appropriations and staffing to implement the program effectively. Include funding for both installing and maintaining cooling systems.
- Increase LIHEAP funding for cooling needs. Despite growing exposure to extreme heat, only 20 percent of LIHEAP funds are spent on cooling (NEADA 2024).
- Modernize eligibility for household funding. Allow households to receive assistance for both heating and cooling in a single calendar year. Increase assistance during extreme heat events. Increase the weatherization allotment, reducing overall household energy costs (Smith, Carforo, and Constible 2024). Allow upgrades for all types of affordable housing (Farrell et al. 2025).
- Link LIHEAP funding formulas to the latest climate and vulnerability data so allocations shift automatically with changing risk zones (Schott 2024).

Further, we recommend that **federal policymakers:**

- Implement a cooling inspection standard for *all* publicly owned or subsidized homes, requiring that cooling deficiencies be remedied within 24 hours. Currently, residents may access additional support for cooling costs only if granted a reasonable disability accommodation (HUD 2024).
- Incentivize strong national, state, and local laws to protect tenant rights to safe, healthy homes. Provide safeguards against eviction during times of acute financial hardship.
- Incentivize strong national, state, and local laws to restrict utility shutoffs, especially during periods of extreme heat (or cold).

State and local policymakers are best positioned to evaluate local needs and customize policies and investments to help meet those needs. We recommend that they:

- Ensure that all “warranties of habitability” for rental properties reflect the growing need for cooling. This warranty is a state-level requirement outlining tenants’ safe, livable home environments.
- Amend provisions for the Low-Income Housing Tax Credit to require backup power to support cooling for affordable multifamily housing developments in the event of grid failures.
- Develop utility-disconnection protections that are heat-index-specific to protect public health. Currently, only 22 states have protective policies for heat-related disconnection (NCAT 2025).
- Supplement LIHEAP funding to help low-income renters and homeowners pay their electricity bills.
- Ensure that programs funding building upgrades include upgrades for energy efficiency, heat resilience, and improved habitability.

- Fund and develop neighborhood-level cooling enhancements (e.g., shade, cool pavements, cool roofs) to limit the amplification of heat in urban heat islands, where subsidized and market-rate affordable housing are frequently located.
- Simplify application processes and provide technical assistance for rural areas and populations that may not have sufficient resources and capacity to help increase their access to funding to mitigate extreme heat (Headwaters Economics and the Federation of American Scientists 2025).
- Reassess and reform local land-use and zoning policies. Include evaluations of the siting of new affordable housing units and manufactured home parks to ensure that these decisions incorporate climate resilience.

Federal, state and local policymakers must also invest in science, expertise, tools, and freely accessible information that decisionmakers and the public need to keep safe:

- Nationwide, free, unhindered **access to federal climate and weather data** is essential for decisionmakers and communities to understand risks and implement protective policies and measures. Two critical examples are the National Weather Service heat alerts and the National Climate Assessment's projections of extreme heat.
- **Local and state public health authorities** should also invest in improving the tracking of heat-related illnesses and deaths, integrating that process with the collection of housing data. Information on the social and economic determinants of health is critical to improving policy interventions that would safeguard vulnerable populations, including the residents of affordable housing.

Toward a Livable Future

Extreme heat, fueled by climate change, already causes significant hardships to millions, disproportionately affecting households living with low or fixed incomes. With heat-trapping emissions continuing to rise, deadly extreme heat will worsen in the future. Policymakers at all levels must take these challenges seriously. They must break through financial and policy challenges and address the acute affordable housing shortage. Equally important, decisionmakers must ensure that investments in heat resilience—for both existing and new homes—protect the health of all residents.

The urgency of these issues is growing as climate change, primarily caused by rising heat-trapping emissions from burning fossil fuels, drives up average temperatures globally and exacerbates extreme heat events (IPCC 2023, USGCRP et al. 2023). By acting now to invest in climate-resilient affordable housing, federal, state, and local policymakers can help ensure that people are safe where they live today, and that they will continue to be protected in the decades to come. At the same time, the nation and the world must also take steps that sharply curtail global warming emissions to limit dangerous heat in the future.

Authors

Juan Declet-Barreto is a bilingual senior social Scientist for climate vulnerability in the UCS Climate and Energy program. **Amanda Fencel** is the program's director of climate science. **Rachel Cleetus** is the program's senior policy director. **Zoe Middleton** is the program's

associate director for just climate resilience. **Avery Kaplan** is a research consultant in the program.

Acknowledgments

The generous support of UCS members made this analysis possible. The authors thank our reviewers for their thoughtful feedback and contributions: Andrew Aurand (National Low Income Housing Coalition), Lauren Dunlap (University of California, Los Angeles), Noah Durst (Michigan State University), C.J. Gabbe (Santa Clara University), and Esther Sullivan (University of Colorado, Denver). We also thank our UCS Colleagues: Kate Cell, Melissa Finucane, Ryan Fleischer, Chitra Kumar, J. Pablo Ortiz-Partida, Erika Spanger, Heather Tuttle, and Shana Udvardy. Organizational affiliations are listed for identification purposes only. The opinions expressed herein do not necessarily reflect the individuals who reviewed it. The Union of Concerned Scientists bears sole responsibility for the contents of this report.

References

- Aurand, Andrew, Dan Emmanuel, Kelly McElwain, and Cate Asp. 2023. *Natural Hazards and Federally Assisted Housing*. Washington, DC: National Low Income Housing Coalition, and Cheshire, CT: Public and Affordable Housing Research Corporation. <https://preservationdatabase.org/wp-content/uploads/2023/11/Natural-Hazards-and-Federally-Assisted-Housing.pdf?hsCtaTracking=23ea612b-d5d3-42f2-a1cb-5a94e4202770%7C3d5222cf-8b20-43e1-8a53-80db1081bc07>
- Benz, Susanne Amelie, and Jennifer Anne Burney. 2021. “Widespread Race and Class Disparities in Surface Urban Heat Extremes Across the United States.” *Earth’s Future* 9 (7): e2021EF002016. <https://doi.org/10.1029/2021EF002016>
- CDC (Centers for Disease Control and Prevention). 2024a. “Temperature Extremes.” March 2. <https://www.cdc.gov/climate-health/php/effects/temperature-extremes.html>
- — —. 2024b. “Tracking Heat Events.” May 13. <https://www.cdc.gov/environmental-health-tracking/php/data-research/tracking-heat-events.html>
- Curran-Groome, Will, Andrew Rumbach, Annie Rosenow, Esther Sullivan, and Oriya Cohen. 2025. “Mobile Homes Are Vulnerable to Climate Extremes. Here’s What Policymakers Can Do Before the Next Disaster.” *Urban Wire*, January 31, 2025. <https://www.urban.org/urban-wire/mobile-homes-are-vulnerable-climate-extremes-heres-what-policymakers-can-do-next>
- Dahl, Kristina, Rachel Licker, John T. Abatzoglou, and Juan Declet-Barreto. 2019. “Increased Frequency of and Population Exposure to Extreme Heat Index Days in the United States during the 21st Century.” *Environmental Research Communications* 1 (7): 075002. <https://doi.org/10.1088/2515-7620/ab27cf>
- Declet-Barreto, Juan. 2025. “Heatwave Exposes How Trump Administration Cuts Endanger Workers and Energy-Burdened Communities.” *The Equation (blog)*, July 2. <https://blog.ucs.org/juan-declet-barreto/heatwave-exposes-how-trump-administration-cuts-endanger-workers-and-energy-burdened-communities>
- Declet-Barreto, Juan, Benjamin L. Ruddell, Jarrett J. Barber, Diana B. Petitti, and Sharon L. Harlan. 2025. “A Socio-Spatial Model of the Risk of Hospitalization from Vulnerability to High Temperatures.” *Preprint, Epidemiology*, April 3. <https://doi.org/10.1101/2025.03.29.24319024>
- EIA (US Energy Information Administration). 2020. “Residential Energy Consumption Survey (RECS).” <https://www.eia.gov/consumption/residential>
- — —. 2023. “U.S. Energy Insecure Households Were Billed More for Energy than Other Households.” May 30. <https://www.eia.gov/todayinenergy/detail.php?id=56640>
- EPA (Environmental Protection Agency). 2025. “Heat Island Effect.” <https://www.epa.gov/heatislands>
- Farrell, Dan, Jasmine Mah, Reuven Sussman, and Mike Specian. 2025. *Estimating the Impacts of Weatherization Readiness Programs*. Washington, DC: American Council for an Energy-Efficient Economy. <https://www.aceee.org/research-report/b2504>
- Gabbe, C.J., and Gregory Pierce. 2020. “Extreme Heat Vulnerability of Subsidized Housing Residents in California.” *Housing Policy Debate* 30 (5): 843–60. <https://doi.org/10.1080/10511482.2020.1768574>

- Gabbe, C.J., and Gregory Pierce. 2024. “The Roles of Housing and Household Characteristics in U.S. Residential Heat Risk.” *Findings*, April. <https://doi.org/10.32866/001c.116607>
- Gabbe, C.J., Gregory Pierce, Matthew J. Barnett, and Sara Hughes. 2025. “The Multiple Drivers of Thermal Disparities in US Manufactured Housing.” *Urban Studies*, March 31. <https://doi.org/10.1177/00420980251320852>
- Harati, Raquel, Dan Emmanuel, Katie Renzi, and Andrew Aurand. 2025. *The GAP Report: A Shortage of Affordable Homes*. Washington, DC: National Low Income Housing Coalition. https://nlihc.org/sites/default/files/gap/2025/gap-report_2025_english.pdf
- Harlan, Sharon L., Juan H. Declet-Barreto, William L. Stefanov, and Diana B. Petitti. 2013. “Neighborhood Effects on Heat Deaths: Social and Environmental Predictors of Vulnerability in Maricopa County, Arizona.” *Environmental Health Perspectives* 121 (2): 197–204. <https://ehp.niehs.nih.gov/doi/10.1289/ehp.1104625>
- Harlan, Sharon L., Paul Chakalian, Juan Declet-Barreto, David M. Hondula, and G. Darrel Jenerette. 2019. “Pathways to Climate Justice in a Desert Metropolis.” *People and Climate Change: Vulnerability, Adaptation, and Social Justice* (April): 23–50. <https://doi.org/10.1093/oso/9780190886455.003.0002>
- Headwaters Economics and the Federation of American Scientists. 2025. *Extreme Heat Is Not Just an Urban Threat: The Risk to Rural Communities*. <https://headwaterseconomics.org/natural-hazards/wildfire/extreme-heat-risk-to-rural-communities>
- Hoffman, Jeremy S., Vivek Shandas, and Nicholas Pendleton. 2020. “The Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat: A Study of 108 US Urban Areas.” *Climate* 8 (1): 12. <https://doi.org/10.3390/cli8010012>
- HUD (US Department of Housing and Urban Development). 2024. “Picture of Subsidized Housing (PoSH).” Office of Policy Development and Research. <https://www.huduser.gov/portal/datasets/assths.html>
- IPCC (Intergovernmental Panel on Climate Change). 2023. “Weather and Climate Extreme Events in a Changing Climate.” In *Climate Change 2023, The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press. <https://doi.org/10.1017/9781009157896.013>
- Kear, Mark, Margaret O. Wilder, Karina G. Martinez-Molina, Laura McCann, and Dugan Meyer. 2023. “Home Thermal Security, Energy Equity and the Social Production of Heat in Manufactured Housing.” *Energy Research & Social Science* 106 (December): 103318. <https://doi.org/10.1016/j.erss.2023.103318>
- Keightley, Mark. 2025. “An Introduction to the Low-Income Housing Tax Credit.” No. RS22389. Congressional Research Service Report RS22389. <https://www.congress.gov/crs-product/RS22389>
- Kelly, Cathleen, Lucero Marquez, and Jasia Smith. 2024. *How Congress Can Protect Families from Dangerous Heat and Ensure Cool and Healthy Homes for All*. Washington, DC: Center for American Progress. <https://www.americanprogress.org/article/how-congress-can-protect-families-from-dangerous-heat-and-ensure-cool-and-healthy-homes-for-all>
- LIHEAP (Low Income Home Energy Assistance Program). n.d. “LIHEAP Clearinghouse: State Snapshots.” Accessed September 9, 2025. <https://liheapch.acf.gov/snapshots.htm>
- Lungman, Tamara, Marta Cirach, Federica Marando, Evelise Pereira Barboza, Sasha Khomenko, Pierre Masselot, Marcos Quijal-Zamorano, et al. 2023. “Cooling Cities through Urban Green Infrastructure: A Health Impact Assessment of European Cities.” *The Lancet* 401 (10376): 577–89. [https://doi.org/10.1016/S0140-6736\(22\)02585-5](https://doi.org/10.1016/S0140-6736(22)02585-5)
- NCAT (National Center for Appropriate Technology). 2025. “Hot Weather Disconnect Policies.” LIHEAP Clearinghouse. <https://liheapch.acf.gov/Disconnect/hot-weather.htm>
- NEADA (National Energy Assistance Directors Association). 2024. “Energy Hardship Report”. Washington, DC: NEADA. <https://neada.org/wp-content/uploads/2024/08/August-Summer-Hardship-Report-Final.pdf>
- NOAA (National Oceanic and Atmospheric Administration). 2025. “2024 Was the World’s Warmest Year on Record.” January 10. <https://www.noaa.gov/news/2024-was-worlds-warmest-year-on-record>
- NWS (National Weather Service). n.d. “Understanding Heat Alerts.” Accessed September 23, 2025. <https://www.weather.gov/safety/heat-ww>
- Schott, Justin. 2024. *Optimizing \$4 Billion of Low-Income Home Energy Assistance Program Funding to Protect the Most Vulnerable Households from Extreme Heat*. Washington, DC: Federation of American Scientists. <https://fas.org/publication/liheap-extreme-heat>

- Scott, Mathilda, Sara E. Grineski, Timothy W. Collins, and Daniel E. Adkins. 2025. "Climate Gaps: Disparities in Residential Air Conditioning Access Across Ten US Metropolitan Areas." *Applied Geography* 176 (March): 103537. <https://doi.org/10.1016/j.apgeog.2025.103537>
- Smith, Caleb, Annie Carforo, and Juanita Constible. 2024. *LIHEAP Needs a Lifeline: A Call to Strengthen the Low Income Home Energy Assistance Program in a Changing Climate*. New York, NY: National Resources Defense Council, and New York, NY: WE ACT for Environmental Justice. <https://weact.org/wp-content/uploads/2024/08/LIHEAP-Report.pdf>
- Tsoulou, Ioanna, Clinton J. Andrews, Ruikang He, Gediminas Mainelis, and Jennifer Senick. 2020. "Summertime Thermal Conditions and Senior Resident Behaviors in Public Housing: A Case Study in Elizabeth, NJ, USA." *Building and Environment* 168 (January): 106411. <https://doi.org/10.1016/j.buildenv.2019.106411>
- UCS (Union of Concerned Scientists). n.d. "Danger Season Tracker," May 1, 2024 to October 31, 2024. Accessed September 2, 2025. <https://dangerseason.ucsf.org>
- US Census Bureau. 2024. "Historical Households Tables: Table HH-2. Households by Race and Hispanic Origin of the Householder: 1970 to 2023." November. <https://www.census.gov/data/tables/time-series/demo/families/households.html>
- USGCRP (US Global Change Research Program, National Environmental Satellite, Data, and Information Service, Allison R. Crimmins, Christopher W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock). 2023. *Fifth National Climate Assessment*. US Global Change Research Program. <https://doi.org/10.7930/NCA5.2023>
- Williams, Augusta A., John D. Spengler, Paul Catalano, Joseph G. Allen, and Jose G. Cedeno-Laurent. 2019. "Building Vulnerability in a Changing Climate: Indoor Temperature Exposures and Health Outcomes in Older Adults Living in Public Housing during an Extreme Heat Event in Cambridge, MA." *International Journal of Environmental Research and Public Health* 16 (13): 2373. <https://doi.org/10.3390/ijerph16132373>

Endnotes

¹ The term "affordable housing" generally describes housing whose costs are within the financial capacity of households (e.g., housing costs should not exceed 30 percent of a household's gross income). Our research focused specifically on affordable housing that serves the needs of low-income and very-low-income households. We used HUD's definition of low income (at or below 80 percent of the Area Median Income—AMI) and very low income (at or below 50 percent of the AMI). Extremely low-income households are defined as those with incomes at or below either the federal poverty guideline or 30 percent of the AMI, whichever is higher (Harati et al. 2025).

² While the nation has 45.6 million renter households and 47.6 million rental units, but only a portion of them (34.2 million) are affordable to low-income households; and an even smaller portion (7.1 million) is affordable to extremely low-income households. Unfortunately, nearly half of these (3.3 million of 7.1 million) "are occupied by higher-income households, leaving only 3.8 million rental homes that are both affordable and available for extremely low-income renters" (Harati et al. 2025).

³ Air conditioning is an "eligible modest amenity," according to HUD. HUD says this means the department at best treats air conditioning as an "optional" measure (HUD 2024).

⁴ According to UCS calculations based on HUD's 2024 Picture of Subsidized Housing data on socioeconomic characteristics of tenants in public housing and project-based subsidized housing, a person 62 years of age or older heads 53.7 percent of households on average; a woman with children heads 39.3 percent of households; and 28.7 percent of all persons in federally subsidized households live with a disability.

⁵ Due to data constraints, manufactured housing was the only market-rate affordable housing type that UCS analyzed.

⁶ Here we reference county or county equivalents as designated by the US Census Bureau.

⁷ HUD's Picture of Subsidized Housing includes data on other household-level racial/ethnic categories but with a high fraction of suppressed or otherwise unavailable data for many of these variables. We did not include those in our analysis.