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Cooling Communities in a Warming Planet: Policies for Extreme Heat Mitigation

By Anusha Narayan

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Introduction

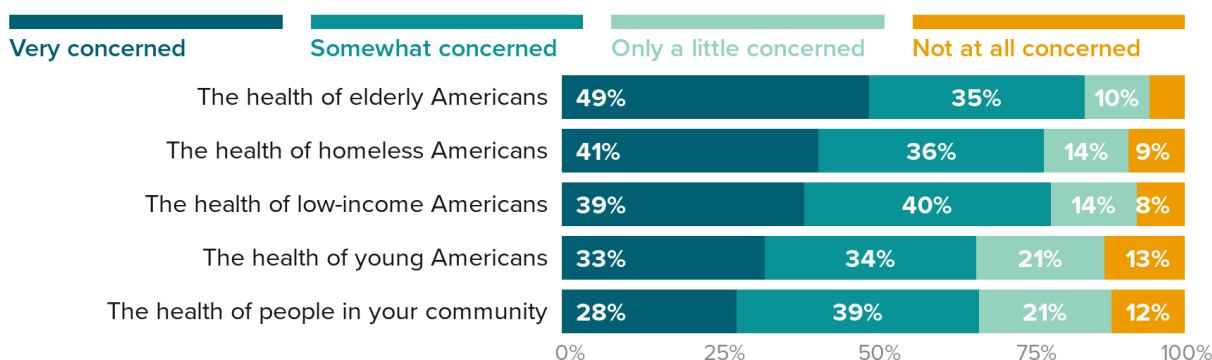
The last eight years have been the hottest on record, with 2022 ranking as the fifth hottest since record keeping began in 1880. Climate change is creating extreme heat anomalies (periods of abnormally high temperatures that persist over a relatively long period of time) across the globe, putting large populations at risk. Extreme temperatures are especially dangerous in areas that are not equipped to handle them, including cold climate regions, communities lacking sufficient cooling infrastructure, and marginalized, disabled, and disenfranchised communities.

In July 2021 the Pacific Northwest, a region where lasting heat waves are historically rare, experienced a weeklong heat wave with temperatures reaching 116 degrees Fahrenheit. The extreme temperatures led to the deaths of 800 people across Oregon, Washington, and British Columbia, with the majority of these individuals being elderly people who were living alone. Because the Pacific Northwest typically has a temperate climate, many people do not have access to air conditioning or cooling systems within their homes. In response to this heat wave, Oregon passed a law enforcing all homes built after April 2024 to have air conditioning (the top protective measure against heat-related illness and death) in at least one room of the house — a sign that even typically temperate states are waking up to the urgent need to adapt to a changing climate. The Pacific Northwest is not the only region facing the dangers of extreme heat. Fatalities related to extreme heat increased globally by 74 percent between 1990 and 2016, making heat the cause of more deaths than any other extreme weather anomaly. The consequences of extreme heat can be felt across the U.S., particularly by those who have disabilities, are elderly, and are experiencing housing insecurity. Structural racism — macro-level discrimination against people of color embedded into large-scale systems and sectors such as housing, education, and healthcare — also contributes to extreme heat disproportionately impacting Black and brown communities.

New Data for Progress polling of 1,199 national likely voters finds that 67 percent of voters are “very concerned” or “somewhat concerned” about extreme heat impacting the health of their community. Voters are most concerned about the health of elderly Americans in extreme heat events, with 84 percent indicating that they are very or somewhat concerned about this population. A majority of voters are also concerned about the impact of extreme heat on the health of low-income (79 percent) and homeless Americans (77 percent). Widespread concerns about the health impacts of extreme heat on communities underscore the need for interventions that create safer and cooler conditions throughout the country.

Voters Are Concerned About the Effects of Extreme Heat on Americans

How concerned or not concerned are you about extreme heat events impacting each of the following?



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The planet has already warmed by 1 degree Celsius since preindustrial times and, without intervention, is in danger of approaching the 1.5 °C increase that scientists have long warned would have catastrophic ramifications for both society and the planet. As global climate systems continue to evolve, more frequent, intense, and unpredictable heat waves are to be expected, suggesting that policy and infrastructure need to be put in place to create a heat-resilient nation. In order to mitigate extreme heat and protect communities across the U.S., federal, state, and local governments should expand heat-mitigating infrastructure that serves the dual purpose of supporting community access to cooling systems and scaling down greenhouse gas (GHG) emissions that exacerbate global warming.

The Paradox of Cooling Communities in a Warming Planet

Anthropogenic activity is widely accepted as the main driver of climate change and warming global temperatures, which result in unpredictable extreme weather events like heat waves. As more frequent heat waves occur, cooling systems are used more frequently and at a higher intensity, not just for people, but also in the form of refrigeration for produce, medicine, electronics, and other goods and materials deemed essential for the function of society. However, many cooling processes, such as air conditioning and refrigeration, rely on the use of refrigerants, substances that absorb and release heat to cool air or maintain low temperatures. Many refrigerants are potent greenhouse gases, including hydrofluorocarbons (HFCs), chlorofluorocarbons (CFCs), and hydrochlorofluorocarbons (HCFCs), which can be released into the atmosphere as a result of refrigerant leakage as well as emissions associated with the generation of electricity to provide the cooling service. When released, these substances contribute to rising global temperatures by trapping heat and preventing it from escaping the Earth's atmosphere, creating a paradoxical effect where the immediate solution to the problem of extreme heat actually exacerbates the underlying issue.

Warnings about widespread electrical blackouts often closely follow news of a heat wave anomaly, as current cooling systems can be energy-intensive and strain local power grids. In September 2022, California faced a late-summer heat wave where an increase in statewide energy usage, driven by increased deployment of home and public cooling systems, caused several power grid transformers to blow out. The state proposed rolling blackouts during the heat wave as a preventative measure to keep the energy grid from collapsing. While California was able to avoid widespread blackouts or even load shedding (a temporary and deliberate disruption of energy usage by utilities to avoid blackouts) largely due to consumer conservation, energy demand was at a record high due to cooling needs from triple-digit temperatures. The state declared the highest-level energy emergency, the step right before widespread blackouts. California's energy grid challenges demonstrate that the U.S. is not equipped to handle the demand of extreme heat, which, without intervention, will only continue to increase due to climate change.

The Consequences of Extreme Heat

Climate change and rising global temperatures are enabling conditions for heat waves to become longer, more frequent, and more extreme. Extreme heat exacerbates other climate disasters like wildfires and droughts while simultaneously causing an increase in water usage for individual households. Heat waves also threaten food systems, as drought and above-average temperatures are unfavorable for plant growth. Extreme heat also threatens the health and wellness of people, particularly those who live within cities and urban spaces.

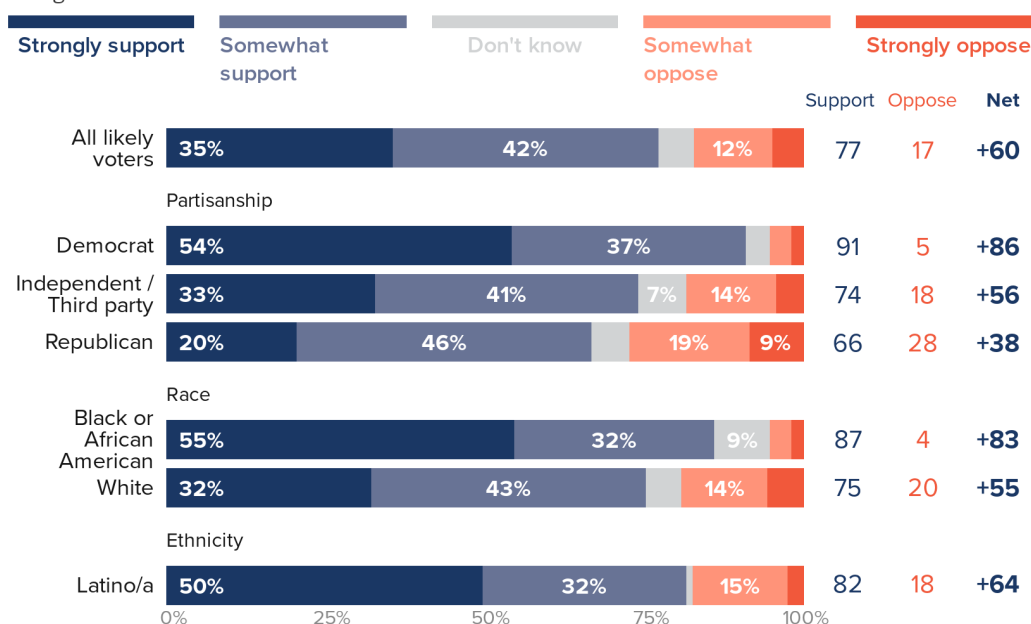
Urban spaces are disproportionately impacted by heat due to a phenomenon called the urban heat island (UHI) effect. Built infrastructure such as buildings, roads, and pavements, which are more concentrated in urban spaces and made of impermeable materials like concrete and asphalt, absorb and reemit more solar radiation than natural structures such as trees, which typically have higher surface reflectivity than their man-made counterparts and also offer temperature-lowering shade to surrounding areas. Due to the UHI effect, urban spaces tend to be around 1-7 °F hotter than suburban and rural areas. Higher energy use and cooling needs in areas impacted by the UHI effect also can contribute to power outage frequency. In addition, the UHI effect disproportionately impacts communities of color and other historically marginalized groups. Studies by the Environmental Protection Agency (EPA) have found that BIPOC and low-income communities experience hotter temperatures relative to other neighborhoods within a city, suggesting that heat-mitigation interventions should be targeted toward these communities. Data for Progress polling shows that 77 percent of voters support programs that specifically invest in cooling infrastructure for marginalized communities, with almost all Democrats (91 percent), 74 percent of Independents, and 66 percent of Republicans in support of these investments. Furthermore, Black (87 percent) and Latino/a (82 percent) voters support these investments at a particularly high rate. BIPOC respondents' perceptions on investments in marginalized communities are especially significant because of the firsthand impacts of extreme heat that are experienced within these communities.

National Voters Support Cooling Infrastructure Investments for Marginalized Communities

Extreme heat disproportionately affects marginalized communities, including low-income communities and communities of color. Members of marginalized communities are more likely to live in urban heat islands, where they experience higher temperatures compared to rural areas because urban areas have more heat-absorbing surfaces, like concrete buildings and pavements.

Because of these risk factors, members of marginalized communities are also more likely to suffer illness resulting from extreme heat.

Would you support or oppose programs that specifically invest in cooling infrastructure for marginalized communities?



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Not only does extreme heat lead to fatalities, but it also continues to take a major toll on the economy. A study by the Atlantic Council found that the U.S. faces \$100 billion in losses annually due to extreme heat, a number that is projected to double by 2030. This value was calculated by assessing the decrease in productivity many workers face due to the impact that extreme heat has on their ability to complete their job. While heat most directly affects outdoor jobs, research shows that even predominantly indoor industries, such as retail and service, face a decrease in productivity during extreme heat events as well. The consequences of extreme heat on the economy are so widespread across the nation that only nine counties out of more than 3,000 in the U.S. have not experienced any economic detriment as a result. These counties are all located in Alaska — the coldest state on average. Among the industries affected by extreme heat, agriculture is one of the most harmed. Reduced worker safety and productivity, in combination with the disruptions that extreme heat has on crops, has a direct impact on decreased crop yield. Additionally, 73 percent of farmworkers in the United States are immigrants, and extreme heat creates conditions where marginalized communities, who make up the majority of farmworkers, are disproportionately at risk in their place of work. Without intervention, the consequences of more frequent extreme heat events will continue to decrease crop yield, causing record-breaking increases in the cost of food across the nation at a time when skyrocketing food prices are already impacting families.

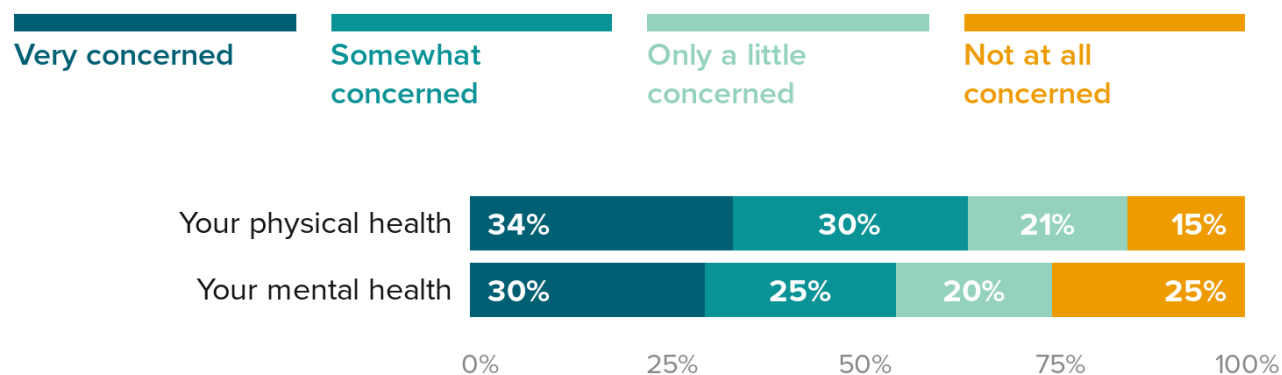
Extreme heat also poses serious health risks. Long-term exposure to extreme heat can lead to heat exhaustion, nausea, cramping, and dehydration. When core body temperature reaches 104 F, the body is unable to cool itself, causing swelling in the brain and organ damage. This condition is known as heatstroke and can have permanent health impacts and even cause death without prompt treatment. One of the main symptoms of heatstroke is confusion, meaning an individual might not even be aware that they are experiencing dangerous symptoms. And as climate change proliferates, nights are becoming increasingly warmer, leaving people with less respite from the heat. Research has found a robust link between extreme heat at night and insufficient sleep, suggesting an increase in illness related to sleep deprivation, such as hypertension, diabetes, depression, and cardiovascular disease, as the Earth continues to warm.

Extreme heat is also linked to adverse mental health outcomes, specifically an increased risk of suicide and self-harm. A study conducted in California has connected heat waves to increased risk of hospital admissions due to mental illness. Climate doomism, a surge of anxiety especially among young people caused by feelings of fear and hopelessness about climate change, is a phenomenon that is exacerbated by climate emergencies such as extreme heat. Psychotropic drugs, which are prescribed to treat certain mental illnesses, can have a side effect where they impair the body's ability to regulate its own temperature, causing the physical impacts of extreme heat to be exacerbated. People, particularly children, who are taking these medications are at risk for heat-related illnesses during extreme heat events. As the Earth continues to heat due to climate change, heat-related mental illness will continue to become more prevalent, making it essential that mental health interventions are incorporated in studies about heat resiliency.

Data for Progress polling shows prevalent concern about the negative mental and physical health implications of extreme heat. A strong majority of voters (64 percent) are concerned about extreme heat events impacting their physical health, while 55 percent are concerned about extreme heat's impacts on their mental health. As extreme heat events continue to increase in frequency and intensity due to climate change, these concerns will likely rise.

Voters Are Concerned About the Personal Impacts of Extreme Heat

How concerned or not concerned are you about extreme heat events impacting each of the following?



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The impacts of extreme heat on health are not equally felt across the country, however, as there are a number of factors that cause heat to disproportionately affect marginalized, low socioeconomic status, disabled, homeless, and elderly communities.

Heat Inequality: Social Determinants of Health

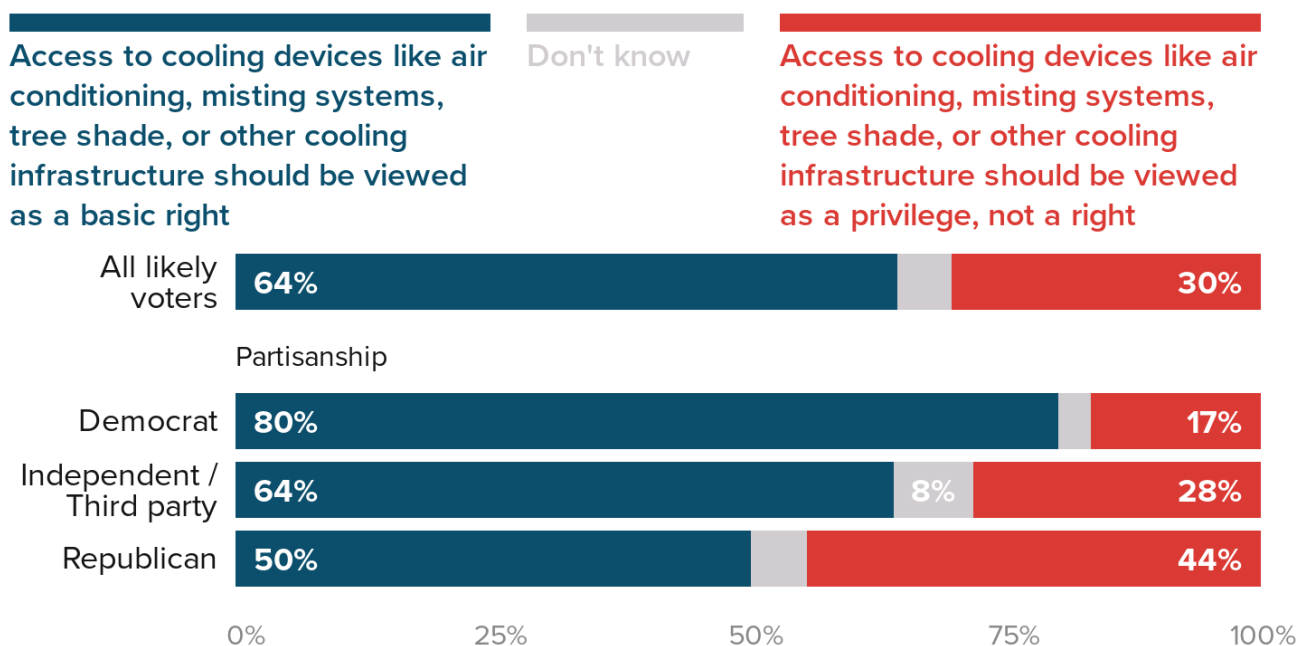
The consequences of heat are not distributed equally among populations. Social determinants of health (SDOH) are factors that public health experts look at to understand patterns in health outcomes and exposure to health risks. The Centers for Disease Control and Prevention (CDC)'s SDOH framework focuses on a few key areas: 1) access to healthcare (such as primary care), health insurance, and health literacy; 2) access to education, education attainment, high school graduation, access to higher education, and language and literacy; 3) social and community contexts that include discrimination, incarceration, and access to community and inclusion; and 4) economic stability as well as the neighborhood and built environment, which includes housing and direct environment. Public health experts study these factors to understand their impacts on diagnosable physical and psychological illnesses, enabling them to develop preventative measures by implementing evidence-based interventions. In contrast to medicine, public health programs target whole communities and populations rather than individuals. They do so by working to improve the social determinants of health. The SDOH framework is also useful for studying extreme heat and the communities it impacts the most, and understanding how to build a preventative environment.

Lack of social support is a prominent social determinant of health in heat-related fatalities. Social resilience, the act of community mobilization in an emergency, has shown to be essential in preventing fatalities in a heat emergency. Those who have disabilities, are homeless, or are elderly are most commonly excluded from community mobilization efforts and therefore do not have the same level of protection from social resilience.

Infrastructure inequality is another important social determinant of health in extreme heat. Research from the [Arizona Department of Health Services](#) demonstrates roughly a third of heat-caused deaths happen inside the home, a pattern reflected throughout much of the nation. Additionally, cold climate regions, which do not traditionally experience extreme heat, typically do not have widespread infrastructure to support cooling, thus making extreme heat particularly dangerous in these areas. Air conditioning and adequate infrastructure to cool a home is often viewed as a luxury and not a necessity in more temperate locations, despite the growing trend of more extreme heat across the country and the well-documented health benefits of cooling systems in the face of growing global temperatures. To combat these consequences of climate change, access to cooling infrastructure is critical. Americans broadly agree. Among national likely voters surveyed, 64 percent agree with a statement claiming that access to cooling systems “should be viewed as a basic right,” while only 30 percent agree with a statement arguing that access to cooling devices “should be viewed as a privilege, not a right.” The majority of voters across partisanship believe that access to cooling should be a basic right, with 80 percent of Democrats, 64 percent of Independents, and 50 percent of Republicans in agreement with this statement.

Voters Across Partisanship Believe Access to Cooling Should Be a Right, Not a Privilege

Which of these statements best describes your view, even if neither is exactly right?



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Structural racism also makes Black and brown communities especially vulnerable to heat-related illness and fatalities. One of the consequences of heat is that it exacerbates preexisting conditions such as [high blood pressure](#) and [diabetes](#), which impact BIPOC communities at a disproportionate rate as compared with their white counterparts. Environmental racism also impacts temperatures in certain

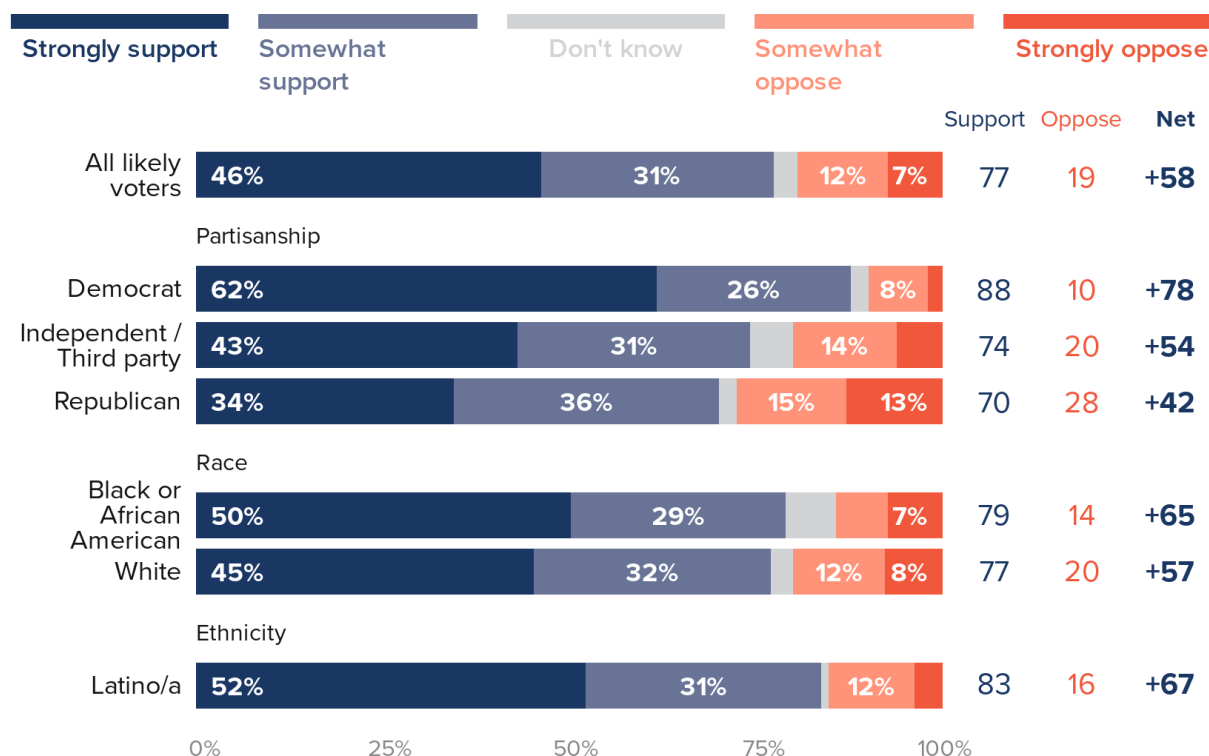
neighborhoods. Recent studies show that low-income and BIPOC neighborhoods are less likely to have tree coverage and green spaces, which help regulate temperatures. In fact, studies show that low-income and BIPOC neighborhoods are actually experiencing temperatures around 1 degree Celsius hotter than surrounding wealthy, white neighborhoods.

Among other factors impacting exposure to extreme heat, renting rather than owning a house takes away some individual autonomy over access to cooling. In most states landlords are not required to provide air conditioning to their tenants. A lack of cooling systems within rental units disproportionately impacts Black and brown communities. According to 2019 studies, a majority of both Black households (58 percent) and Latino/a households (52 percent) rent their homes, whereas only 27.9 percent of white households rent. Data for Progress polling shows that more than three-quarters of voters (77 percent) support requiring landlords to provide renters with air conditioning or indoor cooling in areas that experience extreme heat. Results are consistent across partisanship, with 88 percent of Democrats, 74 percent of Independents, and 70 percent of Republicans in support. Notably, BIPOC voters particularly favor this policy, with 83 percent of Latino/a respondents and 79 percent of Black respondents in support.

Likely Voters Support Requiring Landlords to Provide Cooling Infrastructure for Renters

In most of the United States, landlords are not obligated to provide renters with an air conditioner or other indoor cooling devices. This contrasts with the treatment of home heating, which is generally accepted as a basic obligation during winter months.

Would you support or oppose requiring landlords to provide renters with air conditioning or indoor cooling in areas that experience extreme heat events?



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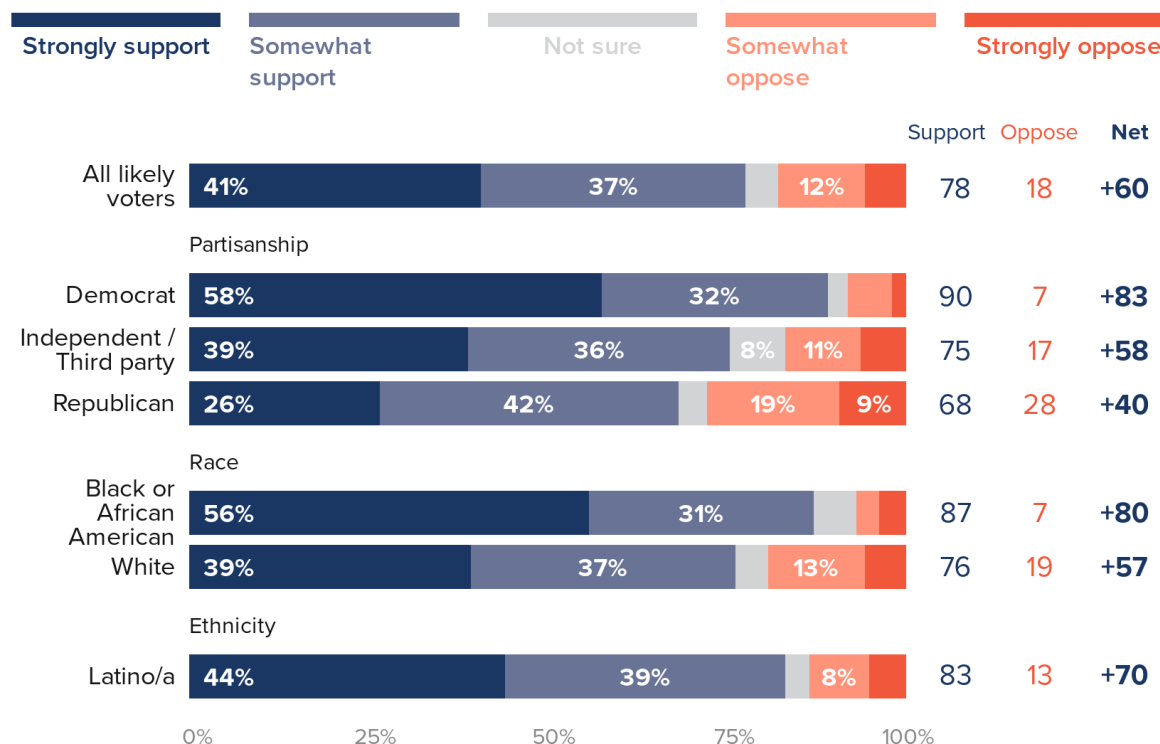
Similarly, prisons offer almost no autonomy for incarcerated individuals to change their basic living conditions. Prisons are also not required by any law to have air conditioning in most states, even during extreme heat events. Incarceration in the United States is highly racialized, as Black Americans make up 38 percent of the incarcerated population despite only representing 12 percent of the total U.S. population. These oppressive systems by design create conditions where communities, particularly marginalized ones, do not have the autonomy to control and regulate temperatures within their living spaces, thus creating unsafe living conditions in extreme heat events.

Seventy-eight percent of voters support requiring air conditioning in state-owned and federally owned buildings such as housing and prisons as well. Support is bipartisan, with a majority of Democrats (90 percent), Independents (75 percent), and Republicans (68 percent) in support, expanding the notion that voters agree that air conditioning is a basic right that should be accessible to all. Eighty-seven percent of Black voters are in favor of requiring air conditioning in federal buildings, which is an important insight in this context, as Black Americans are disproportionately impacted by the incarceration system.

Voters Support Requiring Air Conditioning in State and Federal Buildings, Including Housing and Prisons

Currently, air conditioning is not required in many state- and federally-owned buildings, including housing and prisons, creating dangerous and uncomfortable conditions for some of the most vulnerable Americans.

Would you support or oppose requiring air conditioning in state- and federally-owned buildings, including housing and prisons?



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The origins of heat-related inequality can be traced back to a federal loan-approval program created by [Congress in 1933](#) as a part of the New Deal to support people in paying their mortgages during the Great Depression. In order to encourage banks to invest in communities, neighborhoods were ranked to create a system where banks could prioritize which neighborhoods to invest in. Low-income and BIPOC neighborhoods were consistently ranked lowest, causing banks to invest in them less and creating a widening gap of inequality resulting in a number of protective environmental features, such as green spaces and other heat-mitigating infrastructure, being noticeably absent or inadequate in these communities. This legacy of disenfranchisement has created an unequal playing field in existing efforts to mitigate extreme heat; however, governments at the local, state, and federal level are taking steps to mitigate extreme heat.

Existing Efforts to Mitigate Extreme Heat

A range of federally funded policies and programs have been implemented to mitigate the impacts of extreme heat across the country. One notable example is the [National Integrated Heat Health Information System \(NIHHIS\)](#), a database that equips individuals, communities, and organizations with tools to prepare for and respond to extreme heat events. NIHHIS offers a range of resources, including heat safety tips, information on heat-related illnesses, and resources for vulnerable populations. It also provides guidance for emergency responders, healthcare professionals, and other stakeholders to help them better understand the risks associated with extreme heat and take appropriate action to mitigate its impacts. By providing access to reliable and up-to-date information on extreme heat, NIHHIS plays an important role in supporting efforts to prevent heat-related illnesses and deaths, as well as reducing the economic and social costs of extreme heat events.

NIHHIS provides resources that include several [interactive maps](#) that visualize the impacts of extreme heat in different parts of the United States. The [Heat and Health Tracker map](#) is one such resource that shows the risk of heat-related illnesses across the country based on a range of factors, such as temperature, humidity, and urbanization. The [Heat Watch/Warning map](#) displays current heat watches and warnings issued by the National Weather Service, allowing users to stay informed about potential heat hazards in their area. Additionally, the [UHI map](#) provides information on the extent and intensity of UHIs. These interactive maps enable individuals and communities to identify areas where extreme heat poses the greatest risk and take appropriate action to protect vulnerable populations and mitigate the impacts of heat.

Recently, President Biden signed two bills into law that leverage historic investments in climate and infrastructure — the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA), which serve the dual purpose of upgrading the country's dated infrastructure while tackling GHG emissions that drive warming global temperatures. The [IIJA](#), signed into law in 2021, invests \$550 billion to address long-standing infrastructure needs, improves resilience against extreme weather events, and modernizes the country's infrastructure to meet the needs of the 21st century while addressing climate change and promoting economic growth.

The IIJA includes provisions to support the mitigation of extreme heat impacts across the country. Specifically, the IIJA includes funding for:

1. **CLIMATE-RESILIENT INFRASTRUCTURE PROJECTS:** These projects will construct new infrastructure and retrofit existing infrastructure to withstand extreme weather events, such as floods, storms, and heat waves. The IIJA will prioritize incorporating resilient design features, such as natural infrastructure, that can help absorb heat and mitigate the impacts of climate change.
2. **URBAN HEAT ISLAND MITIGATION:** Mitigating the urban heat island effect is a priority within the IIJA. It includes investments for planting more trees, creating more green spaces, and increasing the reflectivity of buildings and roads.
3. **RESILIENT COMMUNITIES:** Communities, including low-income and underserved ones, will be provided funding for the development of resilient infrastructure, including heat-mitigating infrastructure. The IIJA will also fund projects that promote environmental justice and reduce the disproportionate impacts of climate change on vulnerable communities, such as building comprehensive extreme heat response plans specific to protecting communities within urban heat islands and creating accessible cooling centers across urban spaces.
4. **EMERGENCY RESPONSE AND PREPAREDNESS:** Investments in emergency response and preparedness will be made through the creation of cooling centers during heat waves and other extreme weather events. This will help ensure that communities are prepared for the impacts of climate change and can respond effectively to emergencies when they arise.

Overall, the IIJA aims to address the impacts of climate change and extreme weather events, including extreme heat, by investing in resilient infrastructure.

The IRA is the largest investment in climate and energy in American history. It invests approximately \$369 billion in climate and energy programs, including efforts to mitigate the impacts of extreme heat. Specifically, the IRA includes funding for:

1. **CARBON EMISSION REDUCTION:** One of the goals of the IRA is to cut carbon emissions by 40 percent by 2030 through long-term tax credits for clean fuel, clean hydrogen (hydrogen produced with zero carbon emissions), and direct air capture (removing past CO₂ emissions directly from the atmosphere). Reducing CO₂ emissions is a long-term investment in mitigating climate change, a key driver of extreme heat anomalies.
2. **ENVIRONMENTAL JUSTICE BLOCK GRANTS:** The IRA aims to invest in disenfranchised communities by cutting energy costs, cleaning up pollution, and reducing environmental injustices. IRA will create environmental justice block grants to support community-led interventions that target environmental harms impacting marginalized communities. Through IRA, the EPA's Environmental Justice Collaborative Problem-Solving (EJCPS) Cooperative Agreement Program has received \$100 million in funding for block grants. The EJCPS has launched an application where community-based organizations can propose local climate projects, including the mitigation of urban heat islands and extreme heat.
3. **CLEAN ENERGY EXPANSION:** The IRA prioritizes the expansion of clean energy systems, including increased solar power projects, grant programs for implementing energy-efficient infrastructure in households, and investments in state and local clean energy interventions. These projects will support communities in reducing energy costs during periods of extreme heat and bolstering energy grids.

- 4. STRENGTHENING CLIMATE RESILIENCE:** The IRA strengthens climate resilience within communities by establishing community and urban green spaces as a heat-mitigation strategy and making housing systems more resilient to extreme weather by incentivizing and creating affordable opportunities for homeowners to undergo energy-efficient upgrades. Through the IRA, \$1.5 billion will be distributed as grants to state and local government agencies through the Urban and Community Forestry Assistance program to plant trees and create more urban and community green spaces, which will support the mitigation of extreme heat within these marginalized communities.

Executive actions to mitigate extreme heat will be essential given a newly divided Congress that will not likely pass major climate legislation at the scale of the IIJA or IRA over the next two years despite extreme temperatures continuing to impact communities across the country. The Justice40 Initiative, created via executive order at the beginning of the Biden Administration, directs 40 percent of the benefits of federal investments for climate change, clean energy, and energy efficiency; workforce development; and other related areas to go to historically marginalized communities. As extreme heat continues to disproportionately affect these communities, Justice40 is just one viable avenue for concentrating the benefits of future investments in climate and clean energy and similar efforts that directly address extreme heat in the communities that need them the most.

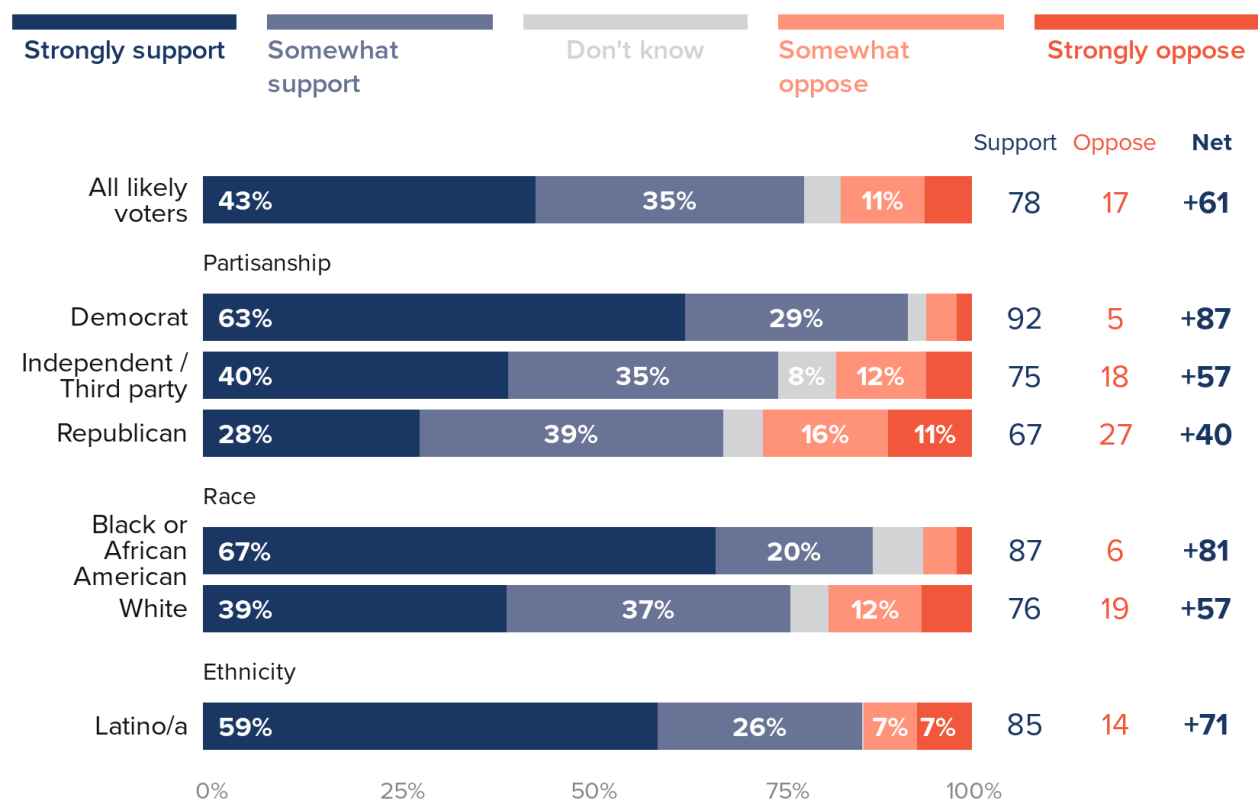
The Low Income Home Energy Assistance Program (LIHEAP) is a federally funded energy assistance program that supports communities by increasing access to air conditioning systems and reducing costs related to home energy bills and weatherization. In April 2022, the Biden Administration provided \$385 million of funding via executive action to LIHEAP to support summer cooling throughout the United States. One example of the implementation of these funds can be seen in the state of Washington, which received an additional \$86 million in LIHEAP funding to develop and implement its first cooling program in partnership with a Washington-based nonprofit, HopeLink. The funding allowed HopeLink to ensure that marginalized populations had access to portable air conditioners, and that water and power stayed on throughout heat waves and other extreme weather. However, LIHEAP would benefit from additional funding and capacity to serve low-income families across the nation. The Heating and Cooling Relief Act would provide LIHEAP with increased annual funding to ensure that families, particularly within marginalized communities, receive support for energy costs across extreme weather events, including heat. Data for Progress finds that 78 percent of voters, including almost all Democrats (92 percent), 75 percent of Independents, and 67 percent of Republicans, support the implementation of the Heating and Cooling Relief Act. Black voters (87 percent) and Latino/a voters (85 percent) support an increase in LIHEAP funding at a higher rate than white respondents (76 percent).

A Majority of Voters Support the Heating and Cooling Relief Act

The Low Income Household Energy Assistance Program (LIHEAP) provides federally funded assistance to reduce the costs associated with home energy bills, energy crises, weatherization, and minor energy-related home repairs. However, LIHEAP is historically underfunded and only serves a fraction of eligible recipients.

The Heating and Cooling Relief Act would increase annual funding for LIHEAP and expand eligibility to ensure that no household pays more than 3 percent of its annual income on energy costs.

Would you support or oppose the Heating and Cooling Relief Act?



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Many cities across the country have implemented and expanded upon heat mitigation strategies in innovative and effective ways. Phoenix, New York City, and Chicago are notable in their efforts to mitigate the heat island effect within their communities.

New York, the most populated city in the country, has a humid subtropical climate with four distinct seasons and experiences hot summers and cold winters. While 90 percent of New York residents have access to air conditioning, access to cooling systems is still limited in lower-income neighborhoods. New York is a leader in climate leadership due to the longevity and widespread implementation of climate

infrastructure and innovation. An organization called the HOPE Program began the NYC CoolRoofs initiative where, with funding from agencies such as the EPA, they work to cover roofs with a white, silicone-based reflective material called Elasto-Kool 1000 that reflects solar heat, cooling indoor and outdoor environments. Since 2009, the HOPE Program has been able to cover 10 million square feet of roofs in New York City, making it one of the largest and most successful cool roof programs in the United States. The program has helped to reduce the amount of heat absorbed by buildings throughout the city and has made a significant contribution to the city's efforts to mitigate the effects of extreme heat. In 2019, New York City passed the Climate Mobilization Act in partnership with the NYC CoolRoofs program, mandating that new buildings in New York City be covered with green roofs, solar panels, or a combination of both.

Phoenix is located in the Sonoran desert — one of the hottest and driest regions in North America — so the city is no stranger to extreme heat. In addition, Phoenix is an urban area with a large amount of concrete and asphalt, both of which absorb and retain heat at a higher rate than lighter surfaces and contribute significantly to increased surface temperatures. This effect may be particularly pronounced in Phoenix due to the city's rapid urban development and sprawling layout. To address this issue, in 2020 the city's Street Transportation Department and Office of Sustainability piloted the Cool Pavement program, an initiative to cool down the city and reduce household energy costs by coating black roads with a light gray paint called CoolSeal that reflects sunlight. The city identified local streets that experience varying temperatures due to exposure to direct sunlight, and replaced regular asphalt with CoolSeal cool pavement. Tests found that the CoolSeal reduced the average surface temperature by around 10.5 to 12 °F during peak heat hours. The Cool Pavement program is part of the city's broader efforts to mitigate the impacts of extreme heat, which include tree planting, shade structures, and misting systems in public spaces, among other strategies. The program is still in the early stages of implementation, but has the potential to make a significant impact in reducing the UHI effect and improving the livability of the city.

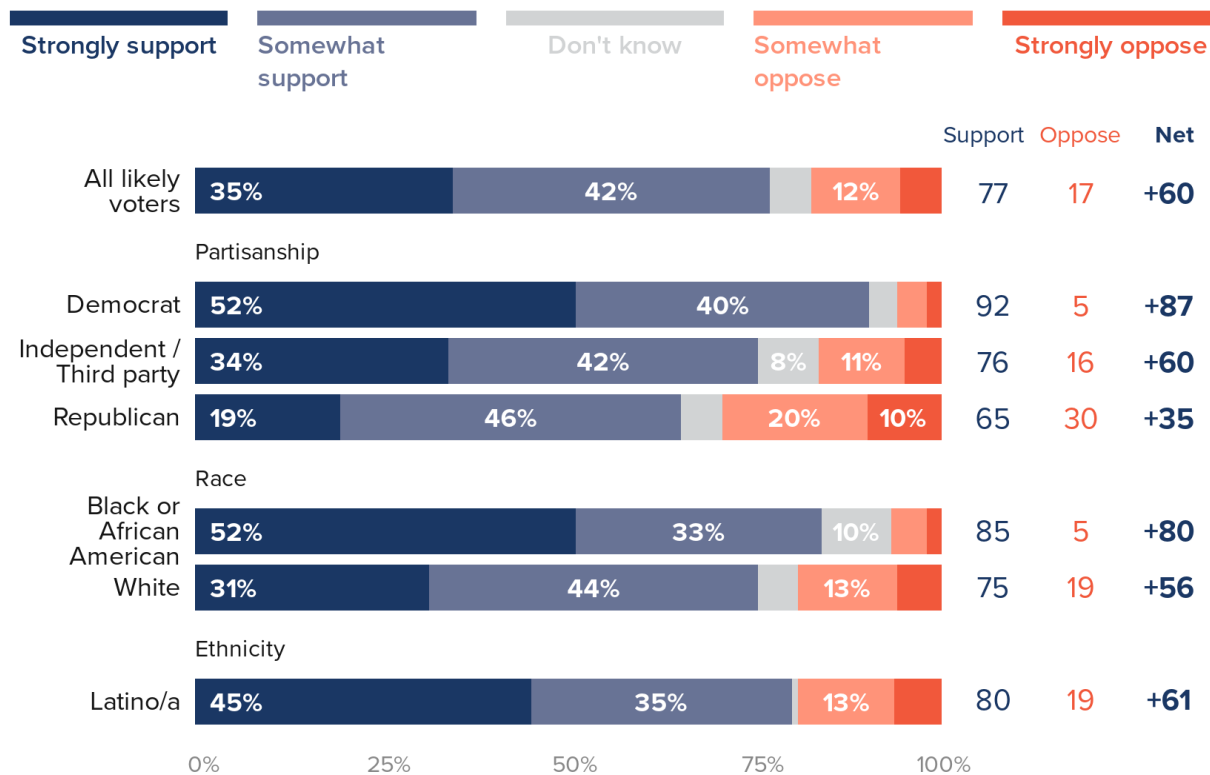
More than three-quarters of voters (77 percent), including 92 percent of Democrats, 76 percent of Independents, and 65 percent of Republicans, support investments in cool roofs and cool pavements within their state or municipality, suggesting that local leaders should use Phoenix and New York as a model for implementing this cooling infrastructure. Notably, 85 percent of Black voters and 80 percent of Latino/a voters are in support of implementing cooling infrastructure, further pointing to the importance of creating targeted cooling interventions that support marginalized communities.

Voters Would Support Cool Roofs and Cool Pavements to Reduce the Urban Heat Island Effect

The heat island effect refers to the observation that urban areas have higher temperatures compared to rural areas because they have more heat-absorbing surfaces, like concrete buildings and pavements.

Cool roofs and cool pavements are designed to reflect less sunlight, and can help combat the heat island effect, thus reducing the temperature in urban areas.

Would you support or oppose your state or municipality investing in cool roofs and cool pavements?



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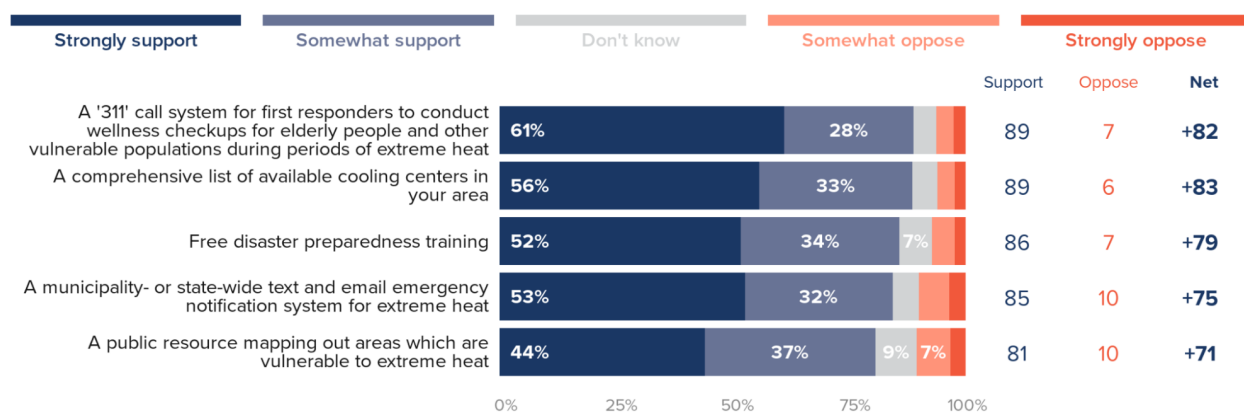
In contrast with Phoenix, Chicago experiences a wide range of weather conditions, including hot, humid summers and very cold, snowy winters. Extreme cold is a frequent challenge that Chicago experiences, with low temperatures averaging in the low teens. However, climate change has made heat waves in Chicago more intense and frequent: 2020 was the city's hottest summer on record, and the summer of 2021 ranked eighth. In response, the city has created a comprehensive set of actions that includes three separate interventions for mitigating extreme heat. The first intervention is to identify all of the current resources for heat mitigation that are already in place. This includes creating a comprehensive list of available cooling centers, a citywide text and email emergency notification system, available disaster preparedness training, as well as a 311 call system where officials conduct wellness checkups for elderly

and other vulnerable populations. The second part of the city's plan is to assess populations and areas within the city that remain vulnerable to current and future climate and extreme heat conditions. Finally, the city has partnered with a local community organization, the Field Museum, to conduct outreach with vulnerable populations and introduce green infrastructure in areas that are prone to the heat island effect.

Data for Progress polling finds that an overwhelming majority of voters support their state or municipality pursuing comprehensive heat preparedness efforts. Notably, 89 percent of voters support a 311 call system for first responders to check on the elderly and other vulnerable populations during periods of extreme heat, showing that Americans are concerned about the impacts extreme heat has on members of their communities. A strong majority of voters also support other measures of extreme heat preparedness, including creating a comprehensive list of cooling centers (89 percent), offering free disaster preparedness training (86 percent), establishing a municipality-wide or statewide emergency notification system (85 percent), and mapping out areas vulnerable to extreme heat (81 percent).

Voters Strongly Support Extreme Heat Preparation and Response Programs

Would you support or oppose your state or municipality creating each of the following?



February 16–21, 2023 survey of 1,199 likely voters

DATA FOR PROGRESS

These citywide programs are innovative approaches to mitigating effects of extreme heat in urban environments, and they represent promising strategies for other communities experiencing similar challenges. While efforts to mitigate extreme heat have been leveraged across the country at all levels of government, further direct interventions to mitigate the impacts of extreme heat should be implemented to protect communities from the growing threat that extreme heat poses. By introducing federal protection against utility shut-offs, mandating that heat-mitigating infrastructure be built within communities, utilizing community benefits agreements to ensure community-centered infrastructure development, and investing in grid resiliency, communities can protect themselves from the debilitating and deadly risks of extreme heat.

Policy Recommendations

As climate change continues to exacerbate heat wave anomalies across the country, federal, state, and local governments should take action to combat the ever-growing threat that extreme heat poses. Specifically, they must:

1 — IMPLEMENT FEDERAL PROTECTION AGAINST UTILITY SHUT-OFFS DURING EXTREME HEAT

To date, 19 states and the District of Columbia¹ have protections that prevent utilities from being shut off in a heat wave for customers who have missed payments. This leaves the majority of the U.S. population vulnerable to having their cooling systems shut off by their utility companies. The PUDDLE Act calls for the Public Utility Regulatory Policies Act (PURPA), which requires states to create utility shut-off policies, to clarify that terminating service in both extreme heat and extreme cold would be detrimental to health, pushing states to create utility shut-off policies. Recent Data for Progress polling demonstrates that voters concur, with 78 percent supporting a federal law that would prevent utility shut-offs during extreme heat events, including 86 percent of Democrats, 75 percent of Independents, and 73 percent of Republicans.

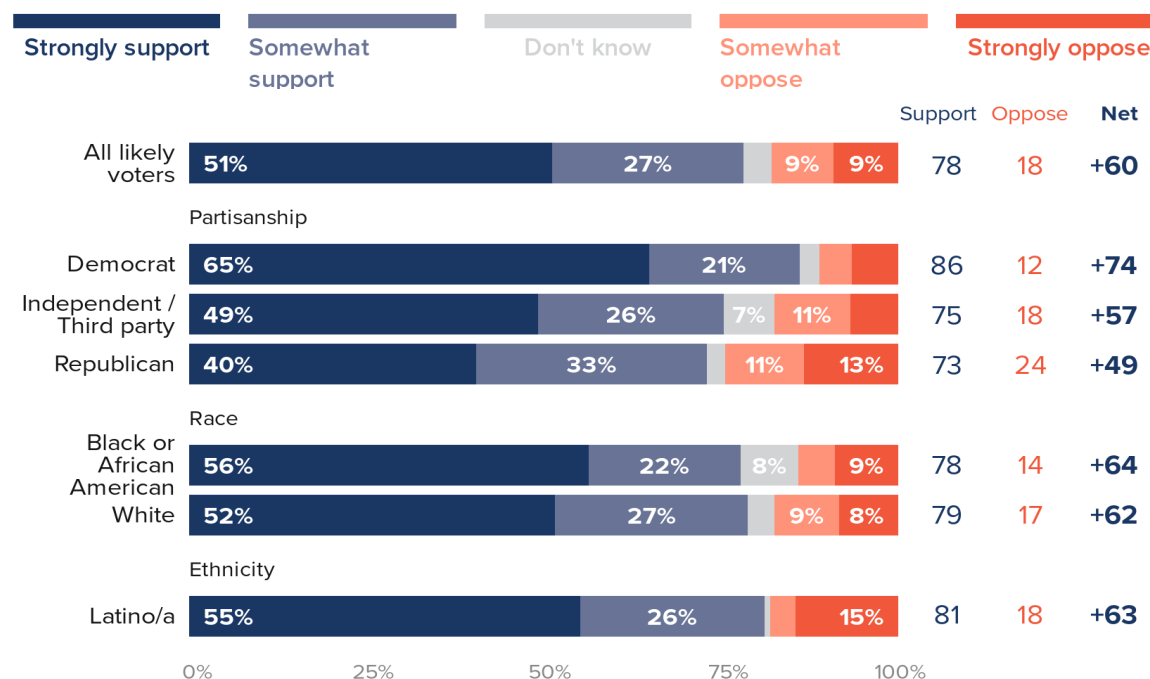
Banning Utility Shut-Offs During Extreme Heat Events Is Supported By a Strong Majority of Voters

Extreme heat poses health risks, causing heat stroke, dehydration, and even death. These risks are higher for low-income Americans, who may lack access to air conditioning.

Some states allow their utility providers to shut off energy access if customers are behind on payment, even during heat waves. This forces low-income Americans to risk potentially fatal health consequences because they cannot afford their utility bills.

Lawmakers are considering passing a law to prevent utility shut-offs during extreme heat events.

Would you support or oppose a federal law that prevents utility shut-offs during extreme heat events?



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¹ Currently, the states with protections against utility shut-offs in extreme heat include: Arizona, Arkansas, California, Colorado, Delaware, Georgia, Illinois, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Nevada, New Jersey, Oklahoma, Oregon, Rhode Island, Texas, and Wisconsin.

2 — MANDATE HEAT-MITIGATING INFRASTRUCTURE TO BE INCORPORATED INTO COMMUNITIES VULNERABLE TO EXTREME HEAT

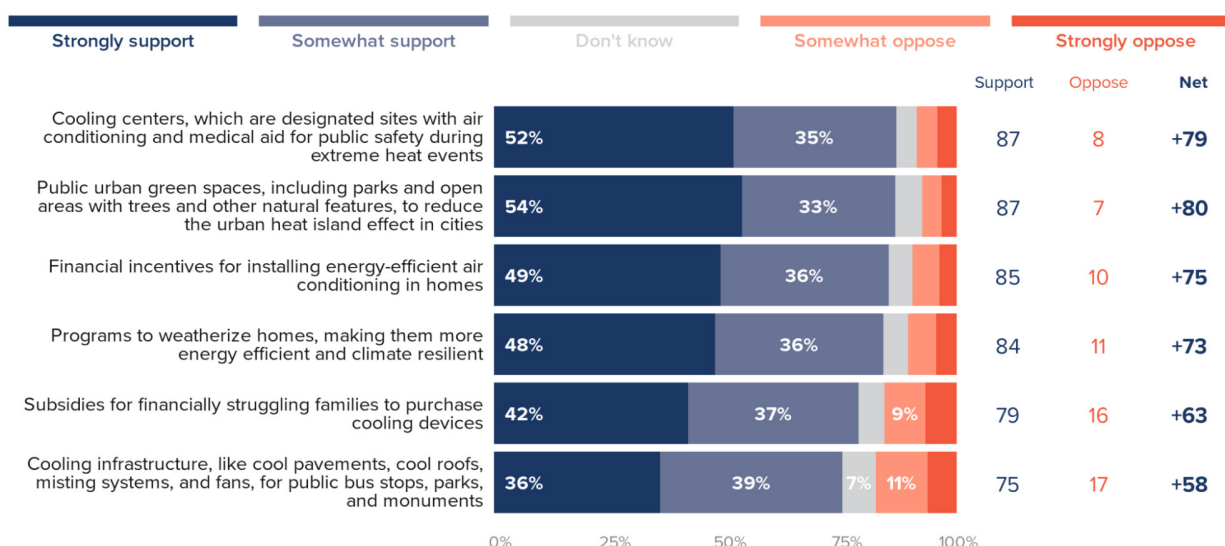
Using Phoenix and New York City as examples, cities should mandate the implementation of cool roofs and cool pavement into their infrastructure to combat urban heat island effect. To mitigate extreme heat at the local level, communities should implement:

- **SOLAR REFLECTIVE COOL ROOFS:** Painting roofs with a solar reflective coating reflects sunlight away from a building, significantly decreasing temperatures within the building and therefore lowering energy demand for occupants.
- **VEGETATIVE GREEN ROOFS:** Similar to cool roofs, planting a layer of vegetation on rooftops can contribute to decreasing the surface temperature of the roof and an entire building as well.
- **COOL PAVEMENTS:** Installing a reflective layer on a community's sidewalks, streets, and parking lots can significantly reduce the surface temperature of surrounding areas. The cool pavements pilot program in Phoenix resulted in surface temperatures decreasing by 10.5 to 12 °F during peak heat hours.
- **TREE COVER IN URBAN SPACES:** Increasing tree and vegetation density within a community can lower surface and air temperatures. Shaded surfaces can be 20–45 °F cooler than the peak temperatures of unshaded surfaces.

Data for Progress finds a majority of voters support investing in various heat-mitigating infrastructure, including all mitigation interventions tested. Notably, cooling centers and public urban green spaces both receive the most support, with 87 percent of voters indicating that they would like their state or municipality to invest in these cooling strategies. Eighty-five percent of voters support financial incentives for installing energy-efficient air conditioning in homes, and 84 percent support programs to weatherize homes to make them more energy- and climate-efficient. Voters clearly want to see changes in infrastructure within their communities and their own homes to be more prepared for extreme heat events.

Likely Voters Would Support Investments in Infrastructure to Mitigate the Effects of Extreme Heat

Would you support or oppose your state or municipality investing in each of the following?



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DATA FOR PROGRESS

3 — UTILIZE COMMUNITY BENEFITS AGREEMENTS TO ENSURE COMMUNITY-CENTERED INFRASTRUCTURE DEVELOPMENT

Climate innovation technology often focuses on emissions reduction, which is crucial for mitigating long-term impacts of climate change. However, community benefits agreements (CBAs) — contractual agreements between developers and local communities that outline the benefits a community can receive for supporting a development project — can be used to advocate for measures that synergistically deal with emissions and short-term climate impacts like extreme heat. Recent Data for Progress polling finds that 72 percent of voters support the implementation of CBAs for development projects. CBAs can work concurrently with long-term interventions to mitigate climate change and harmful short-term effects on human health. As more large-scale, industrial, climate innovation projects emerge through funding from the IRA and IIJA, communities can advocate for co-benefits that support in mitigating extreme heat.

Successful implementation of heat-mitigation infrastructure and projects within communities entails partnership with local organizations. Governments at all levels should incentivize local community organizations to be involved in the implementation of local climate development through a CBA, where communities can be empowered to be involved and consent to infrastructure implementation while receiving direct benefits resulting from development.

Some examples of provisions that community leaders can advocate for in their CBAs to mitigate extreme heat include:

- **GREEN INFRASTRUCTURE:** Communities can create an agreement where developers are required to include green infrastructure, such as trees, green roofs, and cool pavements, in their projects. Green infrastructure helps absorb heat and can reduce the urban heat island effect. For example, trees and green roofs can provide shade and evaporative cooling, while cool pavements can reduce the amount of heat absorbed by the ground.
- **HEAT-RESILIENT CONSTRUCTION:** A CBA can require developers to build heat-resilient buildings, which are designed to be more comfortable in hot weather. These buildings' features may include shading devices, such as overhangs and shades; natural ventilation, such as operable windows; and energy-efficient cooling systems, such as high-efficiency air conditioners or radiant cooling.

4 — INVEST IN RESILIENT GRID SYSTEMS THROUGH MULTIFACETED INTERVENTIONS

Extreme heat will likely cause a rise in energy demand as cooling needs rise. Current energy systems are not equipped to handle this spike in energy needs, creating the risk of widespread blackouts throughout the country. To create a heat-resilient power grid system, federal, state, and local governments should implement the following strategies:

1. **UPGRADE INFRASTRUCTURE:** Existing power grid infrastructure must be upgraded to withstand high temperatures, particularly in typically cold climate regions that are newly experiencing high temperatures. These upgrades include strengthening transmission lines, upgrading transformers, and improving cooling systems in power plants.

2. **IMPLEMENT SMART GRID TECHNOLOGIES:** Smart grid technologies can detect and respond to changes in energy demand and supply, allowing for more efficient and reliable energy distribution during extreme heat. This can include automated demand response systems, which can automatically adjust energy usage during periods of high demand.
3. **DIVERSIFY ENERGY SOURCES:** Incorporating a mix of energy sources, such as solar and wind, can make the grid more resilient to extreme heat by reducing the risk of power outages caused by disruptions to a single energy source.
4. **IMPROVE ENERGY STORAGE:** Energy storage systems, such as batteries, can store excess energy during periods of low demand and release it during periods of high demand. Improving energy storage mechanisms can help alleviate stress on the power grid during extreme heat.
5. **DEVELOP LOCAL MICROGRIDS:** Microgrids are energy systems that can provide power to a community by operating independently or in conjunction with the grid. Local microgrids can provide backup power during outages and reduce reliance on the main power grid during extreme heat. They can also be powered by renewable energy sources, making them more resilient to disruptions in the energy supply.

Overall, creating a power grid system that is more resilient to extreme heat will require a combination of these strategies, as well as continued research and innovation to adapt to the changing climate.

Conclusion

As the summer months approach and the impacts of climate change worsen, it is crucial to adopt and implement effective strategies to protect vulnerable populations and prevent extreme heat-related illnesses and deaths. We must consider long-term interventions that target the root causes of climate change and extreme heat in conjunction with solutions that mitigate the immediate consequences of extreme heat events.

By implementing federal protections against utility shut-offs during extreme heat, mandating heat-mitigating infrastructure to be incorporated into communities, utilizing CBAs, and investing in resilient grid systems, we can protect communities and provide innovative solutions to staying cool throughout the summer and year-round.

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