[City logo]

City of Tempe Residential Energy Equity Roadmap
Sustainability and Resilience Division

- **Draft Version, NOT FINAL -**

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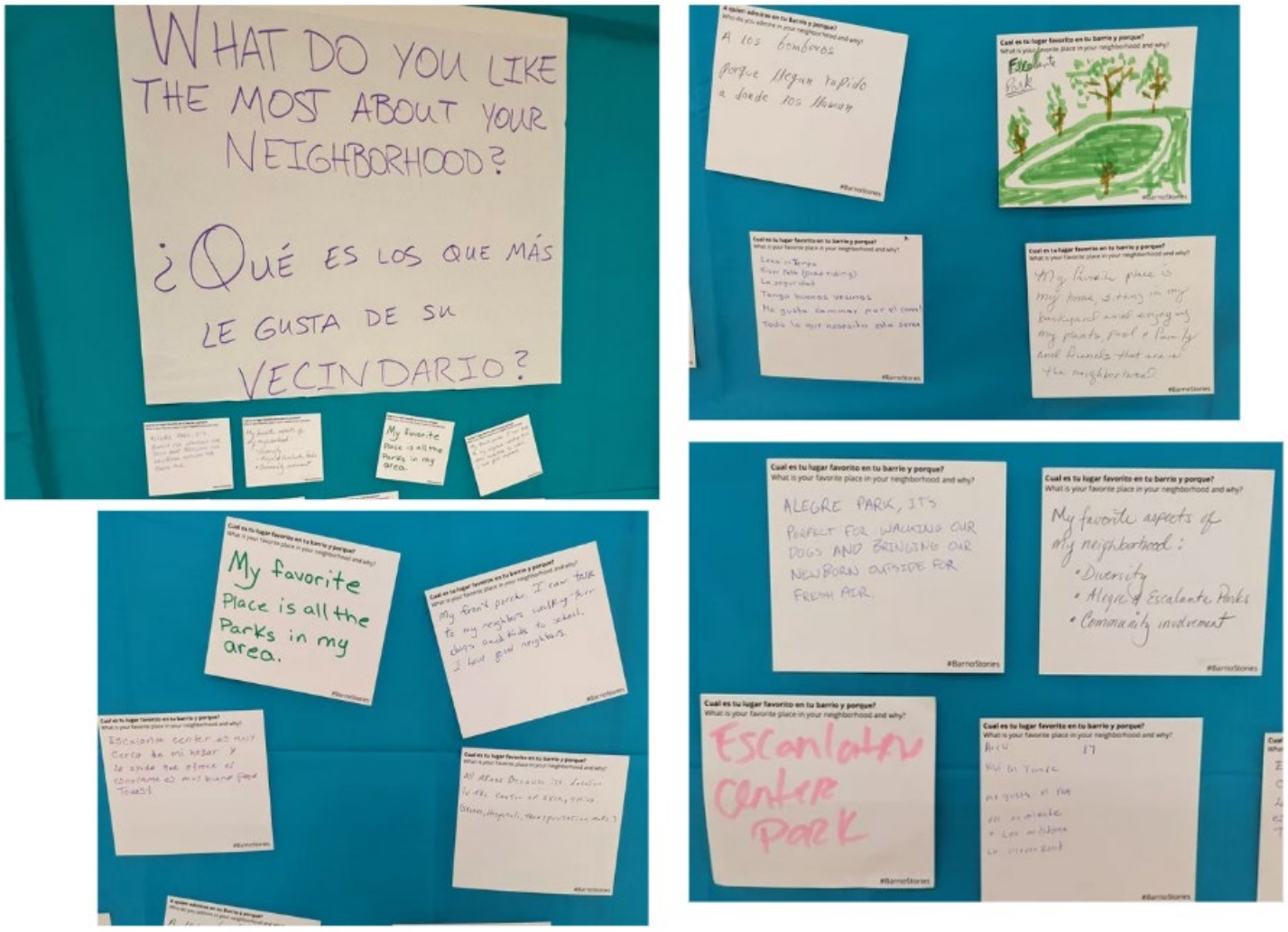


Photo Caption: Climate Justice Advisory Group (CJAG) icebreaker activity where participants shared what they like most about their neighborhoods and their responses.

Purpose and Goal

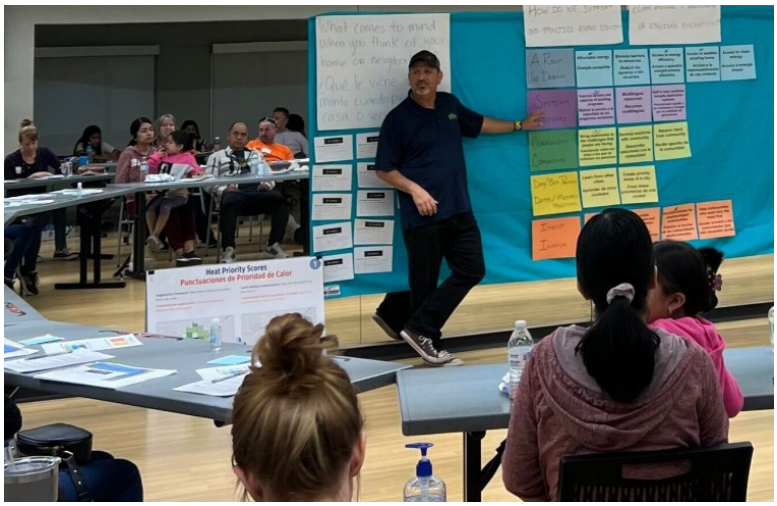


Photo Caption: Masavi Perea from Chispa AZ facilitating a CJAG workshop.

The Residential Energy Equity Roadmap outlines policies, programs, and infrastructure needs to address energy use and extreme heat challenges faced by Tempe residents. The actions in the roadmap were selected and prioritized based on resident input.

The creation of this roadmap involved input from government stakeholders, both within and outside the City of Tempe, whose work aligns with these issues. Internal input came from Community Health and Human Services, while external input was provided by Tempe Community Action Agency.

Addressing residential energy needs and challenges is also a priority to Tempe through a climate change perspective. The City of Tempe has set a Council goal to achieve community carbon neutrality by 2050 with equitable outcomes. This means we are working toward reducing greenhouse gas (GHG) emissions at the community level in a way that is fair and inclusive. Energy use, primarily from electricity powering buildings, accounts for 53% of our community-wide GHG emissions. GHG emissions generated by human activity – mainly energy and transportation – intensify the Greenhouse Gas Effect. A key goal of this roadmap is to create pathways that advance our collective efforts to reduce GHG emissions and adapt Tempe into a resilient city in the face of climate change challenges.

The Residential Energy Equity Roadmap specifically addresses the 16% of residential energy outlined in the GHG emissions data from the year 2020. Residential energy is the focus because the city believes it is important that residents should be able to afford to cool their homes.

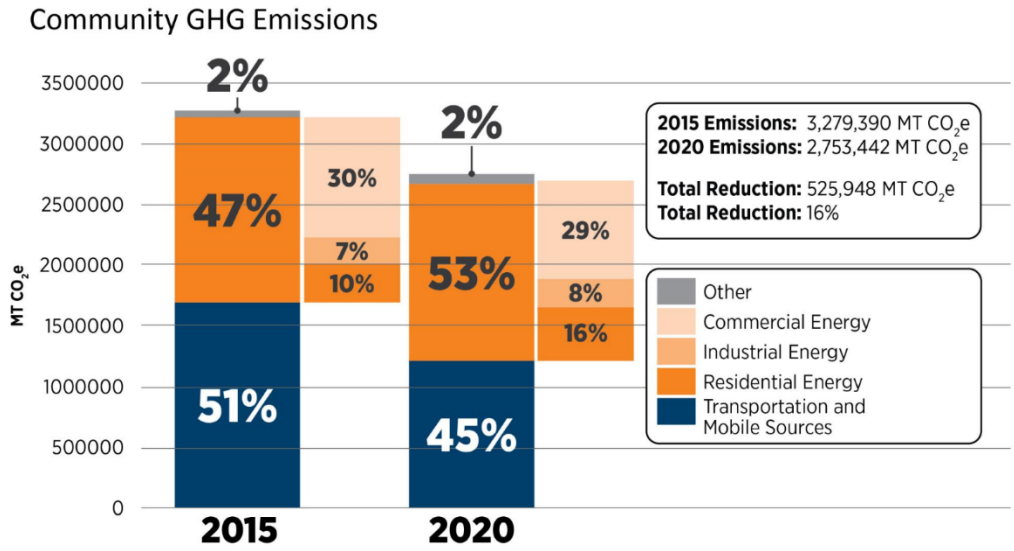
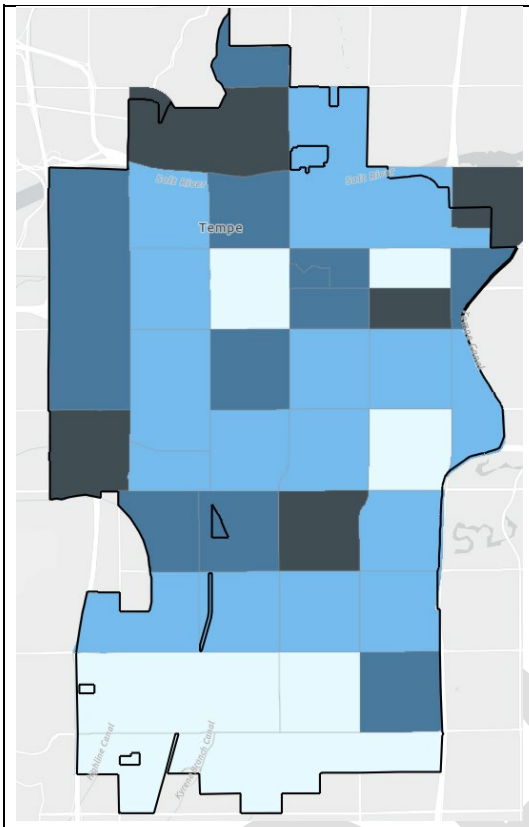


Photo Caption: Community GHG Emissions Comparison between 2015 and 2020. Source: City of Tempe

Energy Equity – What It Is and Why It Matters

Energy equity means creating policies and programs informed by community input and designed to meet the needs of all individuals in relation to accessible and affordable energy. The Residential Energy Equity Roadmap was developed in response to the feedback from residents who participated in the engagement process of the Climate Justice Agenda within the 2022 Climate Action Plan Update (CAP). During this process, residents voiced their struggles with affording energy bills and their need for more support, especially with rising utility rates and record-breaking energy consumption. As part of the broader goals outlined in the 2022 CAP Update, the Sustainability and Resilience Division continues to focus on addressing energy equity issues.



To better understand the level of concern, it is critical to look at energy burden – the percentage of income spent on home energy bills. According to the American Council for an Energy-Efficient Economy (ACEEE), a high energy burden – defined as 6% or more, is linked to higher risk of respiratory illnesses, increased stress and can be detrimental to a person's financial standing and contribute to persons remaining in poverty. The city's goal is to reduce energy burden so that no household spends more than 4% of its income on energy bills by 2035.

Photo Caption: Map of Tempe showing energy burden levels by census tract. Source: Greenlink Analytics

Energy equity is important because it changes how we think about energy access and affordability, introducing new policies and programs that ultimately reduce energy burden with the hope of promoting economic opportunities, especially for communities facing systemic inequalities, barriers, and limited access to resources. Similar policy documents have been created across the United States, such as the City of Charlotte's Strategic Energy Action Plan, the City of Milwaukee's Climate and Equity Plan, and the City of Philadelphia's Energy Poverty Alleviation Strategy Plan. These initiatives demonstrate that cities nationwide are prioritizing equity in their efforts to address energy challenges.

Energy efficiency means using less energy to cool your home in the summer or heat it in the winter, and energy-efficient appliances use less energy to perform the same tasks as standard appliances, all while maintaining the same or better level of comfort. This makes energy efficiency a cost-effective strategy to reduce utility bills. Clean energy are energy sources that are less harmful to the environment, creating very little or no GHG emissions and contributing less to air and water pollution compared to coal, natural gas, and oil. Common clean energy sources are solar, wind, and hydro, among others.

Energy efficiency and clean energy investments have historically underserved disadvantaged groups, including low- to moderate-income individuals, people with disabilities, and people of color. The clean energy transition should benefit disinvested communities by ensuring that energy efficiency and clean energy initiatives, regulations, and investments are equitable and accessible. Well-crafted energy efficiency and clean energy programs and policies enable decision-makers—including electric utilities, regulatory bodies, and

governments—to address energy disparities for low-income households, renters, and other marginalized groups.

The Bigger Picture

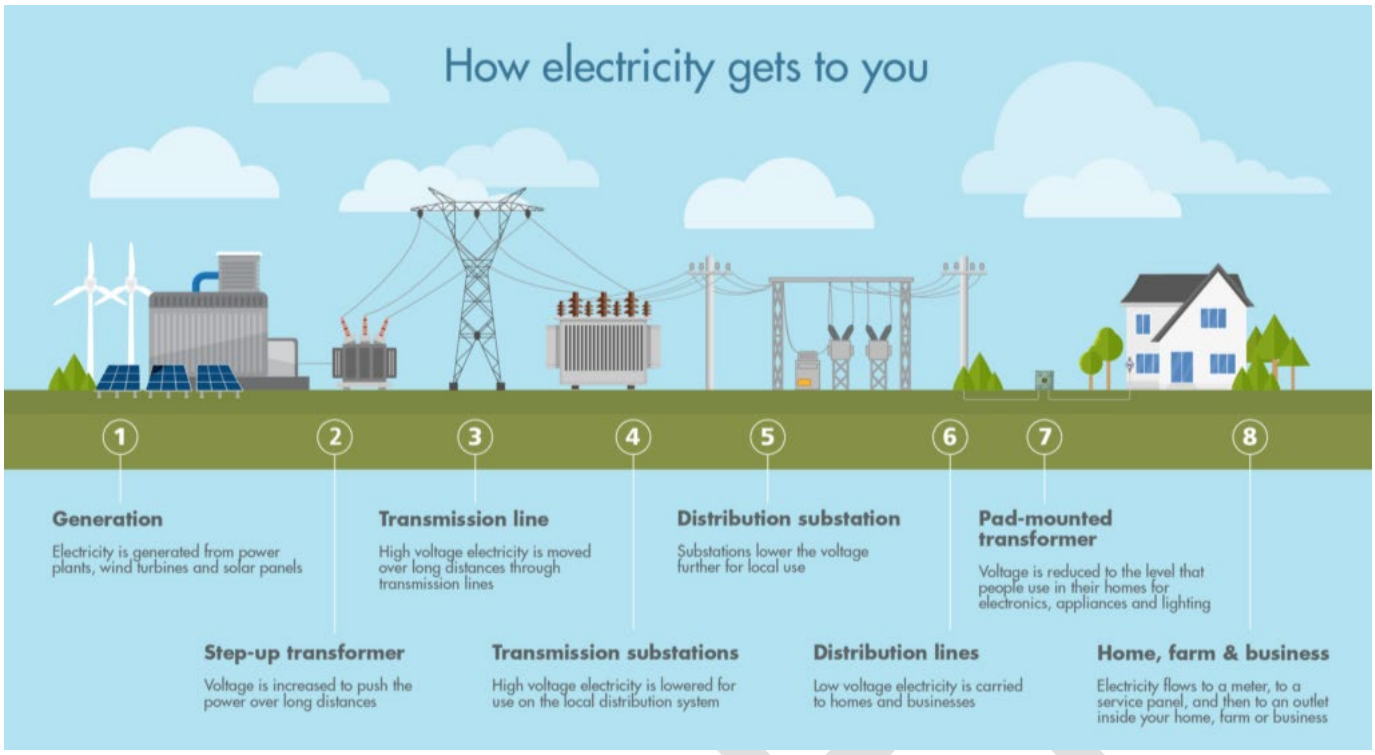
Understanding the Energy System

Energy that is used to light rooms, and heat and cool homes comes from natural resources often referred to as energy sources. There are two categories that energy sources are organized into, fossil-fuel energy and clean energy. Fossil fuels come from plants and animals buried underground over millions of years ago that have turned into oil, coal, and natural gas. These fossil fuels are burned to produce energy that is then used to power vehicles and homes. But the burning of fossil fuels releases toxic pollutants into the air, contaminating the environment and leading to harmful public health effects. These toxic pollutants, such as carbon emissions, are also a primary contributor to climate change, which is why reducing their usage is necessary to meeting the city's carbon neutrality goals. Fossil fuels are also a finite, limited, non-renewable resource.

Clean energy serves as an alternative to fossil-fuel energy sources as they are a natural resource that do not run out and generate very little, or no greenhouse gas emissions compared to fossil-fuels, helping to reduce harmful gases and decrease air and water pollution. Common clean energy sources include:

- Solar: Generated from sunlight, captured using solar panels.
- Hydro: Generated by moving water captured by dams and turbines, typically in rivers.
- Wind: Generated by wind using turbines.
- Geothermal: Generated from heat drawn from within the Earth's core and used to power turbines.
- Tidal: Generated by ocean tides using turbines.
- Biomass: Generated by burning organic materials, such as wood and plants. (Not always considered a clean energy source, but is a renewable source)

Energy is sourced, produced, and delivered across an infrastructure system commonly referred to as an electric grid. In Tempe, residents receive energy from either Salt River Project (SRP) or Arizona Public Service (APS), the state's largest utilities. Both companies manage their own electric grids, set energy prices, and sell electricity directly to their customers, with APS's rates regulated by the Arizona Corporation Commission and SRP's set by its elected board.



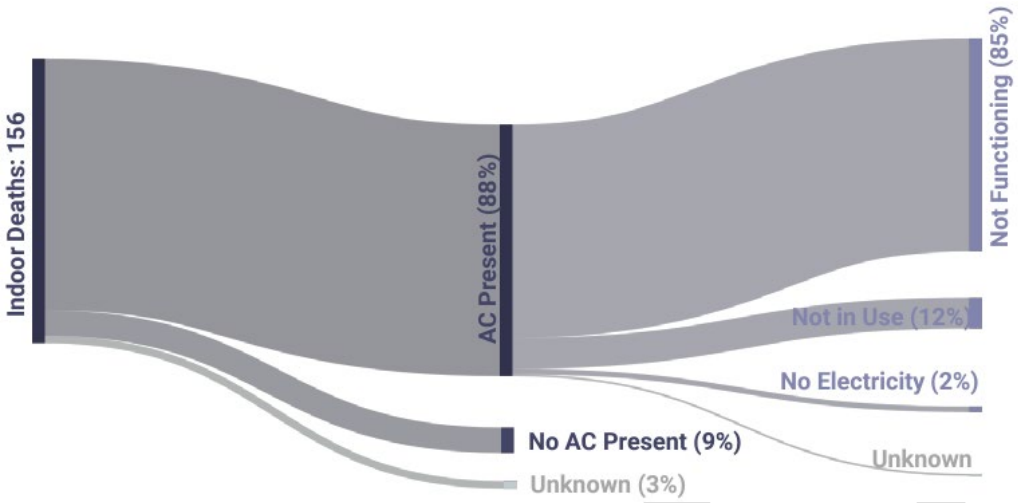
Systemic Perspective and How We Got Here

Energy bills have long been a part of household expenses but rising rates from electric utilities and the overall increase in the cost of living have turned energy burden into a national challenge that cities across the country are addressing. There isn't one specific reason for rising rates, especially given how electric utilities operate differently. However, common reasons include ongoing grid maintenance, necessary upgrades, and a general increase in energy demand that strains the electric grid. Additionally, climate-related impacts, such as wildfires in rural areas, power outages from extreme heat and human-caused accidents also put a strain on the electric grid. It is important to note that customers not only pay for the supply of energy but for the delivery as well; so, when infrastructure investments or damages are made to the grid, it impacts rates.

An increase in energy usage is also a contributing factor, driven by several reasons. To start, Arizona is experiencing one of the fastest growing populations in the country. As more people move to Arizona, there are more households, businesses, and other buildings that rely on electricity, leading to a greater demand on the electric grid. This population growth also contributes to an increase in electrification, the process of switching appliances and vehicles from gas to electric power, such as switching from gas stoves to electric ones or from gasoline-powered cars to electric vehicles. Additionally, extreme heat is impacting energy use. Arizona is experiencing hotter days than in previous years and for more extended periods, with hotter temperatures beginning earlier in the spring and lasting later in the Fall. This puts a strain on households needing to cool their homes against hotter temperatures, leading to running cooling systems longer, higher energy consumption, and increased energy bills.

Economic issues are not the only concern; energy burden also poses a public health concern. As Arizona experiences hotter temperatures, indoor temperatures increase as well. High energy costs affect households from affording basic needs, like food, and force them to make difficult trade-offs, such as limiting the use of air conditioning to cover other needs. Sometimes, these health concerns can prove fatal, Maricopa County identified a total of 645 heat related deaths in 2023, marking a 52% increase from the previous year and the most heat related deaths ever recorded. Of these deaths, 25% occurred indoors, all in uncooled environments. Eighty-eight percent of indoor cases had an air conditioning (AC) unit present on-site and within that 88%, 85% of cases had a non-functioning AC unit, 12% had an AC unit not in use and 2% had no electricity. This indicates that though most of these households had access to cooling, they did not use it, possibly due to

energy insecurity. Energy insecurity is the inability of a household to meet its basic heating, cooling and energy needs over time, and takes into account the household economic means, physical housing conditions and energy-related coping behaviors.



Source: Maricopa County

There are federal resources to help households with energy burden. The two significant resources are the Low Income Home Energy Assistance Program (LIHEAP) which assists residents with utility bills and the Weatherization Assistance Program (WAP) which provides free home improvements to reduce energy costs by increasing the energy efficiency of homes for free.

While these funds are beneficial for households, they are not distributed evenly across the nation, and additional resources are needed to ensure more Arizonans have access to energy and energy efficiency upgrades. Focusing on LIHEAP, Arizona receives a much smaller allocation of funds compared to other states, due to a funding formula that dates back to 1981 that was created to favor cold weather states. Under this formula, Arizona ranks among the lowest on a per capita basis, including all 50 states and Washington, D.C. In fiscal year 2021/2022, Arizona ranked 50th out of 51; in 2022/2023, it again ranked 50th out of 51; and in 2023/2024, it dropped to 51st out of 51.

Similar to LIHEAP, the WAP program uses a funding formula that favors colder states. As a result, Arizona also receives a smaller allocation and ranks among the lowest on a per capita basis, including all 50 states and Washington, D.C. Over the past three fiscal years – 2021/2022, 2022/2023, and 2023/2024 – Arizona has ranked 47th out of 51.

How Federal Funding Flows to Local Communities

Within Arizona, funds received from LIHEAP and WAP are distributed statewide based on allocation formulas created by the federal agencies overseeing the programs. For LIHEAP, the Arizona Department of Economic Security (ADES) distributes funds according to ..... While the Arizona Department of Housing (ADOH) allocates WAP funds based on a federally designated formula that determines distribution across the state using 90% poverty and 10% population key factors. This approach means that funding amounts vary across regions within Arizona.

To administer these funds, ADES and ADOH work with regional governments and agencies. Households must navigate different application processes based on their geographic location. Depending on the locality, they may need to apply through an online portal, a community action agency or directly through their city or county government. This variation in program administration creates confusion not only for households seeking assistance but also for municipalities and organizations trying to connect households to these resources.

In Tempe, the understanding is that households seeking assistance from LIHEAP go through an online portal that can be accessed on Maricopa County's website compared to Phoenix households which can work directly

with the City of Phoenix's Community Services and Initiatives Division. For WAP, Tempe households apply to the program through Foundation For Senior Living's website, a non-profit who administers the program for Maricopa County households, unlike City of Phoenix households who can work directly with their Neighborhood Services Department as the city receives their own allocation of funding.

Given the nuances of how households receive help and the varying capacity and dedication cities have for helping their residents, our residents risk being overlooked.

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Climate Justice Advisory Group

Caption: *Tempe community members attending the Climate Justice Advisory Group workshops.*

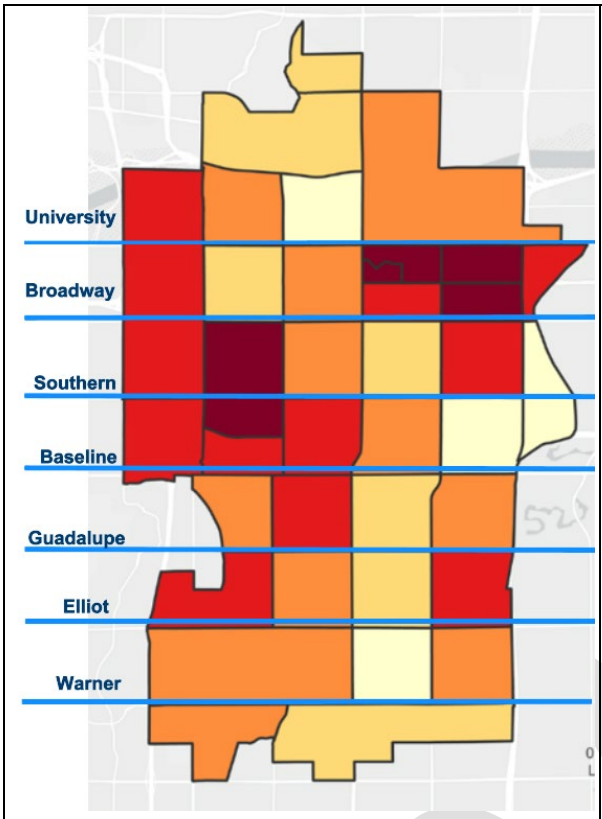
Understanding history is crucial for addressing current disparities, as is the need to support those who have been historically excluded from city decision-making. Decisions made years ago in different areas of the city continue to affect the infrastructure and resources available, particularly during climate events like power outages or heatwaves, within the context of this roadmap.

One initiative to increase resident diversity in city decision-making was represented in the Climate Justice Agenda within the 2022 CAP Update. Ongoing efforts are needed to broaden public engagement and ensure the right priorities are set for the city's future investments. As part of this continuous effort, the Climate Justice Advisory Group (CJAG) was formed to deepen community participation, co-develop solutions, and ensure equitable approaches to addressing energy equity challenges. Community partners include Chispa Arizona and Rail CDC who helped with recruitment and facilitation. Both organizations focus on sustainability efforts in the region, with a particular emphasis on supporting socio-economically and climate-vulnerable populations.

The Sustainability and Resilience Division (SRD) sought feedback from community members on extreme heat and household energy affordability challenges through CJAG. SRD held eight monthly bilingual workshops from February to October 2024. CJAG participants co-created the city's first Residential Energy Equity Roadmap, outlining programs, policies, and infrastructure recommendations to guide funding efforts for community-identified investments. This included examining residential energy efficiency programs, energy cost support, clean energy projects (infrastructure), and urban cooling infrastructure and initiatives.

The geographic target area for this focus group included areas located south of University Drive and north of Broadway, between Rural Road and the Tempe Canal, with a focus on the Alegre, Escalante, and Victory Acres neighborhoods. The focus area was selected based on the city's Heat Priority Scores and energy burden data from the United States Department of Energy's Low-Income Energy Affordability Data (LEAD) tool, prioritizing areas more susceptible to higher energy burdens and the effects of extreme heat.

Heat Priority Scores



A statistical analysis of environmental factors and social factors combined to create a Heat Priority Score map by census tracts. This helps the City of Tempe see which areas have the highest heat priority. Tempe may then prioritize mitigation projects in these areas.

Environmental factors: Land Surface Temperature (LST), Normalized Difference Vegetation Index (NDVI), Normalized Difference Built Index (NDBI), Normalized Difference Water Index (NDWI), and albedo

Social factors: percent non-white, percent below poverty, percent without high school diploma, percent over 65 years, percent living alone, and median income.

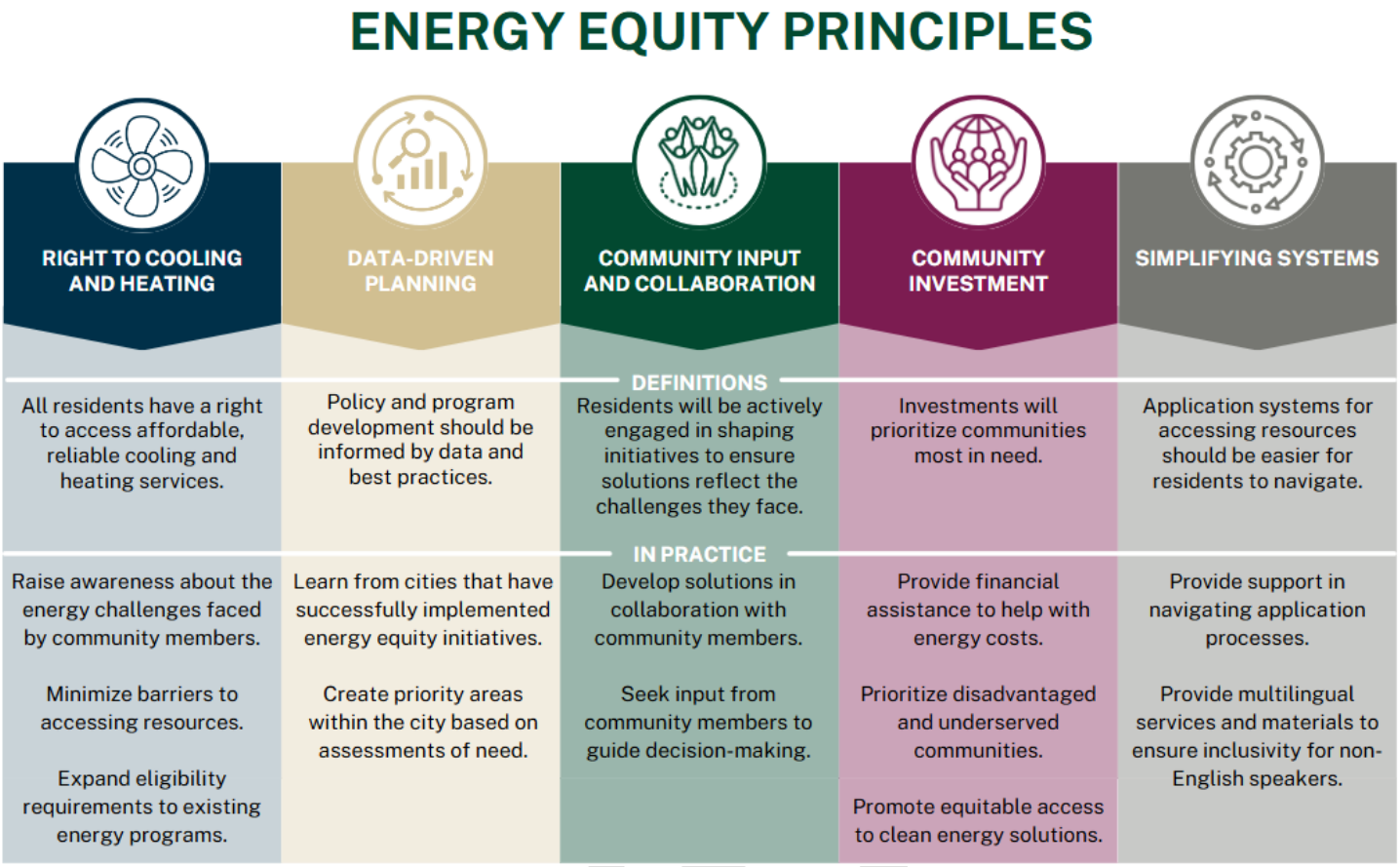
Photo Caption: Map of Tempe showing heat priority scores by census tract. Source: City of Tempe

After the workshop series, SRD held public meetings with at-large Tempe residents to present the proposed Residential Energy Equity Roadmap and gather further feedback. SRD used input from these public events and meetings to enhance the recommended policy, programs, and infrastructure investments. Following the public engagement phase, the finalized Residential Energy Equity Roadmap was presented to City Council, who provided guidance on advancing the roadmap.

Principles of Practicing and Supporting Energy Equity

This document has highlighted the importance of community engagement by involving residents in the stages of city planning to incorporate their ideas. However, it is equally important to understand residents' values. The Residential Energy Equity Roadmap not only outlines actions, but also includes principles that serve as the foundation for future energy equity initiatives. These initiatives will be guided by these principles, significantly shaped by resident feedback through the Climate Justice Advisory Group (CJAG).

During the workshops, members talked about their utility bill costs and noted the lack of choice in utility providers compared to other essential services, such as cellphone providers and companies that sell gasoline at retail for powering vehicles. In states with restructured electric utility industries, customers can select alternative electricity suppliers, a flexibility not available in Arizona. The group identified vulnerable populations, including the elderly, low-income households, and those living paycheck to paycheck, as being most burdened by high utility bills. Through these conversations, they were able to shape their values into principles of practicing and supporting energy equity.



Residential Energy Equity Roadmap

The Residential Energy Equity Roadmap is the culmination of feedback gathered from Climate Justice Advisory Group (CJAG) workshops, public events, and meetings. It summarizes resident input and is organized by key themes. Residents express a strong interest in education around energy savings, efficiency tips, and connecting to resources like home improvement programs and utility bill assistance. However, residents also face barriers in meeting basic home energy needs. Some are ineligible for existing programs due to income requirements, homeownership status, or residency status. Others face difficulties accessing resources even when they do qualify, due to limited program funding, complex application processes, and English-only promotional materials.

Regarding clean energy, residents are interested in rooftop and community solar, largely driven by potential cost savings, though they believe that clean energy should not cost customers more than fossil fuel-based energy. Additionally, residents want to see solar installations on multi-family housing to expand access to clean energy equitably, and they express interest in microgrids at resilience hubs to provide essential services during power outages.

In terms of urban cooling, residents express significant interest in residential tree programs but note the need for both planting and maintenance support. They emphasize that the costs and physical labor involved are major barriers, particularly for seniors and people with disabilities. To improve access, residents suggest allocating funds for maintenance services and assistance with planting. They also emphasize the need for stronger building standards, codes, and tree shade requirements for private developments, including multi-family housing. The Residential Energy Equity Roadmap addresses these concerns by proposing the following actions.

Theme 1: Residential Energy Efficiency

Action: **Enhance Communication on Existing Residential Energy Programs**

- **Strategy:** Expand and promote multilingual communication across all city platforms, including city website, social media accounts, city and school newsletters.
- **Strategy:** Establish an Energy Resource Hub, a one-stop, comprehensive webpage for all home energy related needs and programs. Work with Community Health and Human Services, Community Development (Code Compliance Division), Neighborhood Services, and Communication and Marketing Office on the development, education, and use of the webpage.
- **Strategy**: Invest in the needed capacity to coordinate and promote the Energy Resource Hub including developing workshops, tabling city and school events, answering 311 requests, managing updated webpage information, and providing customer support.

Action: Advocacy for Expanding and Increasing Access to Residential Energy Federal Programs

- **Strategy:** Support Governor Hobbs advocacy in working with Department of Economic Security on updating antiquated funding formula for Low Income Home Energy Assistance Program (LIHEAP) that historically favor cold weather states.
- **Strategy:** Support the advocacy, in collaboration with interested external partners, to increase access to Department of Energy's Weatherization Assistance Program in relation to income requirements and housing type requirements.
- **Strategy:** Advocate to the State of Arizona Department of Housing, the state agency that administers WAP funding, to broaden the range of languages offered in collateral material and customer services.

Action: Resident-Focused Energy Efficiency Programs and Education

- **Strategy:** Partner with utilities and non-profit partners to ensure energy efficiency programs are meeting residential needs and develop an energy education workshop series to be held at EnVision Center.
- **Strategy:** Develop an energy meter lending program that allows residents to borrow energy meters, with availability at various city locations. Residents can learn how much energy each of their devices/appliances use and their associated energy costs.
- **Strategy:** Seek funding opportunities to expand and sustain the City of Tempe's Mobile Home Retrofit Pilot Program beyond its initial phase, extending support to additional housing types and ensuring long-term support for energy efficiency improvements.
- **Strategy:** Support Tempe Community Action Agency in administering current and future federal programs to ensure Tempe residents can access services like the upcoming Home Efficiency Rebates Program (HOMES) and the Home Electrification and Appliance Rebates Program (HEAR).

Action: Strengthening Public-Private Partnerships for Home Energy Solutions

- **Strategy:** Explore formalizing public-private partnerships with Community Development Financial Institutions, philanthropic foundations and other partners to enhance energy solutions and leverage external resources.

Action: Strengthening Building Codes and Standards

- **Strategy:** Continue to track and encourage private developments to adopt the International Green Construction Code (IGCC), while providing education to city staff and for a mandatory IgCC adoption for private development.

- **Strategy**: Reevaluate the existing mandatory International Energy Conservation Code (IECC) and its adopted chapters to determine if enhancements are needed to strengthen the code and improve its effectiveness.
- **Strategy:** Develop a pilot program for benchmarking municipal buildings to encourage transparency around building energy use as future best practice.

Theme 2: Renewable Energy

Action: Advocacy for Advancing Equitable Energy Policies at the State Level

- **Strategy:** Monitor developments in Community Choice Aggregation (CCA) to assess potential opportunities and feasibility for city involvement.
- **Strategy:** Advocate to the Arizona Corporation Commission and utilities for improvements to existing solar, energy efficiency and rate distribution policies to ensure they better serve residents and meet their needs.

Action: Help Households Transition to Renewable Energy Sources

- **Strategy:** Partner with non-profit Solar United Neighbors (SUN) to connect residents with their resources and dedicated staff, helping households of all income levels access rooftop solar energy. Specifically, expanding communication on solar finance options for residents.
- **Strategy:** Partner with SolSmart, a U.S. Department of Energy sponsored technical assistance group, to enhance solar market conditions in the city, making it easier, faster, and more affordable for residents to install solar energy systems. This includes training city staff on best practices in solar PV planning, zoning, permitting, and inspection.
- **Strategy:** Develop and execute a community solar program in a Justice40 area.

Theme 3: Urban Cooling

Action: Promote Urban Cooling through Accessible and Inclusive Tree Programs

- **Strategy:** Implement the Growing Together Tree Steward Program, which will pay and educate community members to grow, plant, and maintain trees in neighborhoods that need them most in Tempe.
- **Strategy:** Work with city staff to explore if any adjustments to the existing Treebate and Cost Match programs could be implemented to better meet community needs, including cost, maintenance, and species. Provide multilingual resources to improve accessibility and help residents understand and participate in these programs.
- **Strategy:** Adopt the updated Urban Forestry Master Plan to provide a comprehensive plan for managing and developing Tempe's tree canopy.

Action: Address Barriers to Urban Cooling through Strategic Investments

- **Strategy:** Adopt the Rain to Roots Master Plan, which focuses on using nature-based solutions, such as increased tree cover, green stormwater infrastructure (GSI), and plants, to help cool the city.
- **Strategy:** Advocate for the adoption of an Urban Cooling Performance Measure by City Council to ensure accountability and track progress, specifically in Heat Priority Neighborhoods, in implementing urban cooling initiatives. This measure will help the city set clear goals and monitor outcomes to ensure the success of urban cooling efforts across the community.

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Want to learn more about sustainability at the City of Tempe?

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