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EMPOWERING
TEXAS COMMUNITIES

APRIL 2024

COMMUNITY VOICES IN ENERGY SURVEY

TEXAS STATEWIDE REPORT

Community Voices in Energy Survey (CVES)

The Community Voices in Energy Survey (CVES) solicited feedback from households that contend with low incomes to better understand concerns around affordable, reliable, and clean energy. Primarily low-to-moderate income (LMI) households earning below the region's median income were surveyed across the Texas Department of Housing and Community Affairs (TDHCA) 13 Uniform State Service Regions. Survey respondents were household members who were at least 18 years old and responsible for energy management decisions in the household.

As the cornerstone of TEPRI's research initiatives, this survey series aims to measure the lived experiences and opinions of households that contend with low-to-moderate incomes as they relate to energy burden, energy insecurity, climate risks, and other key energy-related factors.

CVES data and reports are intended to help inform stakeholders (including lawmakers, regulators, utilities, and community-based organizations) to make better and more informed decisions to address the energy needs of Texas households.

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We extend our heartfelt thanks to all the CVES participants for sharing their valuable insights and a special appreciation to the TEPRI team for their diligent work in reviewing and editing this report. We also acknowledge the invaluable guidance from external advisors and the support from individuals and organizations who contributed along the way. Your collaboration has been vital in advancing our understanding of energy challenges and working towards a more equitable energy future for Texas.

Letter from the Executive Director

Last winter, my family adopted a new puppy, Arlo, at the Lockhart Animal Rescue. As we were filling out the paperwork to bring Arlo home, we learned a little bit more about how Arlo ended up at the shelter. It turns out that Arlo's previous owner was behind on her energy bill and couldn't afford his care. While we are grateful for our boon of abundant puppy love, this news demonstrated how people make tough decisions when it comes to affording their energy bills. Unfortunately, many Texans are forced to forego spending on all sorts of needs to afford to keep their lights on.

For TEPRI, our most important advisors are our neighbors – especially those who struggle to keep their house warm, feel vulnerable during an outage, or must choose between purchasing school supplies for their children or paying their energy bills. With this in mind, TEPRI reached out to our neighbors to better understand their priorities and the barriers they face to accessing affordable, reliable, and clean energy.

Our 2023 Community Voices in Energy Survey (CVES) — a comprehensive survey of more than 6,500 Texans who contend with low incomes — is the cornerstone of our work.

Understanding the day-to-day experience of these households helps us better address the barriers they face in achieving a healthy and stable relationship with energy. As the energy landscape changes, we want to prioritize the most important concerns of the people we serve.

The CVES is our roadmap to making positive changes in our energy system. The results of the survey focus our work and advise our energy solutions. We use the CVES in partnership with our Energy Equity Explorer Tool to devise the most well-informed solutions, educate energy stakeholders across the state, and help bring about a sustainable energy future and the economic well-being of all members of society.

We hope our partners also find these tools useful. Let us know how our continuing CVES work can help advance your goals to bring about a thriving, clean, and reliable energy landscape for us all!

Warmly,

Margo Weisz
Executive Director

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Executive Summary

The energy landscape in Texas is undergoing significant shifts, presenting both challenges and opportunities for its residents, especially those grappling with low-to-moderate incomes (LMI).

This report analyzes how Texans who contend with low incomes interact with our energy systems. The survey details what Texans prioritize, what they are concerned about, and the barriers they encounter in accessing affordable, reliable, and clean energy. The Community Voices in Energy Survey (CVES) includes survey responses from 6,520 households with low-to-moderate incomes across the state. By examining key findings and offering actionable recommendations, it aims to inform strategic decisions that promote equitable access to reliable, affordable, and clean energy.

Survey responses paint a vivid picture of the struggles faced by Texans, with affordability emerging as a central concern.

The burden of energy costs looms large, with 40% of respondents finding them unmanageable.

The report also uncovers a troubling lack of awareness about available assistance programs, leaving 90% of households who may be income-eligible for energy assistance, grappling with unaffordable electricity bills. It is a stark reminder of the urgent need for increased support, targeted outreach campaigns, and streamlined application processes to ensure that support reaches those who need it most.

Reliability and resilience loom large in the minds of Texans with low-to-moderate incomes, especially in the face of unpredictable weather patterns. The findings underscore a pressing need for backup energy sources and improved communication during outages as 60% of respondents reported concerns about indoor thermal comfort and 50% expressed concerns about not being able to charge devices.

Communities are eager to play an active role in demand response efforts with 86% of respondents willing to reduce their energy use to prevent a blackout, presenting an opportunity to bolster grid resilience through bolstered demand response systems and public awareness campaigns.

Amidst these challenges, clean energy interest is high, especially amongst households with the lowest incomes, offering a pathway to lower costs and greater sustainability. However, barriers persist. The report outlines a suite of recommendations, from educational outreach to financial incentives, aimed at promoting awareness and accessibility of clean energy technologies.

At its core, this report is a rallying cry for action. It is a reminder that the transition to a more equitable and sustainable energy future is within reach—but only if stakeholders come together to confront the systemic challenges that keep affordable and reliable energy out of reach for many. By prioritizing affordable, reliable, and clean energy initiatives, Texas can chart a course toward a brighter, more inclusive future.

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Key Survey Findings

The survey identified key findings on energy affordability, energy reliability and resilience concerns, and interest in clean energy. The full report presents a detailed discussion of the findings; below are some highlights.

13
Regions in Texas Surveyed

6,520
Number of Respondents

Dec 2022 - Mar 2023
Period of Data Collection

Energy Bill Affordability

- Roughly 40% of survey respondents report that they find their energy bills to be unaffordable and about 50% of respondents struggle to meet their energy expenses most months.
- Households earning less than $27,000 encountered the most difficulty in paying their electricity bills.
- Nearly half of the respondents (48%) resort to cutting back on entertainment, while 45% prioritize their electricity expenses over clothing purchases.
- A higher percentage of respondents from ethnic or racial backgrounds report that they cut back on household essentials, struggle to pay their bills or find their bills unaffordable.
- Approximately 27% of respondents resort to shutting off their air conditioning during the summer months to alleviate costs.
    - Approximately 30% of households with at least one member under 18 years old (minors) opt to turn off their air conditioner in the summer to save money.
    - Over a third of households (39%) with at least one elderly member reported setting the temperature to an uncomfortable level during the summer.
    - A third of respondents earning less than $13,000 annually reported turning off their thermostats, followed by 29% of those with annual household incomes ranging from $13,000 to $27,000.
- Approximately 25% of all respondents across the state resort to completely turning off their heaters/thermostats during winter periods to reduce costs.
- Nearly one-third of all respondents (31%) set their heaters/thermostats to uncomfortable levels in the winter to save on electricity expenses.
- Sixty percent of respondents with the lowest annual household incomes (less than $27,000) opt to turn off their heaters/thermostats in the winter to save on monthly energy bills.
- In the year preceding the survey, 27% of respondents reported receiving notices regarding potential electricity shutoffs due to non-payment.
- The majority of respondents who experienced disconnections (76%) had annual household incomes of $50,000 or less.
- About 90% of respondents reported not receiving energy assistance from community or utility programs despite likely meeting eligibility criteria.

- Over a third of respondents (40%) noted a lack of awareness of energy assistance programs as the reason for not receiving bill assistance.
- Among the 10% of respondents who received energy bill assistance, the majority learned about these programs through community service organizations (28%) and social media channels (26%).

Energy Reliability and Resilience

- Approximately 87% of households expressed some level of concern about weather-related events resulting in power outages, with 23% expressing extreme concern.
- Extreme concerns about weather-related blackouts decreased as income levels rose.
- Both rural and urban respondents showed a similar level of concern about weather-related blackouts, with 87% of rural and 87% of urban respondents expressing worries.
- Almost 90% of respondents of color expressed some level of concern about weather-related blackouts compared to 86% of White (non-Hispanic) respondents.
- Homeowners are more concerned about weather-related blackouts than renters — 34% of renters express concern whereas 45% of homeowners express concern.
- About 27% of respondents residing in mobile homes report being extremely concerned about such blackouts, surpassing the percentages of extreme concern among those in townhomes (25%), multifamily homes (21%), and single-family homes (23%).
- Sixty percent of respondents express concern about their homes becoming too hot or too cold during outage periods.
- About 61% of households with minors (under 18 years old) or with senior's express concerns about home temperature control during an outage and about half are concerned about being unable to charge or power electronic devices.
- A large percent of respondents (48%) stated they would stay at home, while 47% would seek refuge at their family or relatives' homes when asked where they would go in case of a power outage.

Clean Energy Interest

- The majority of respondents (71%) express a desire for their electricity providers to utilize clean sources of electricity.
    - Only a small fraction (10%) of respondents across the state are enrolled in clean energy programs offered by their electricity providers.
- Almost half of the survey respondents are willing to pay extra on their monthly energy bills to support the use of clean and renewable energy sources.
- Respondents with lower incomes are also more likely to be unaware of their enrollment status in clean energy programs.
- Over half of respondents (52%) of moderate-income households, earning between $50,000 and $80,000 annually demonstrate the highest willingness to invest in clean energy solutions.
- Younger respondents, particularly those in the age groups of 18-30 and 30-40, exhibit a stronger preference for clean energy, and 74% and 75%, respectively, at least agree that they want their electricity company to utilize clean energy sources.
    - The youngest age group (18-30 years old) stands out with the highest proportion of respondents enrolled in clean energy programs, with 13% indicating that they are enrolled.
- A majority of respondents aged 18-30 years old (59%) express a willingness to pay at least $1 more on their energy bills for clean energy.
- A significant majority (74%) of renters express a desire for their electricity company to utilize clean energy sources, compared to 66% of homeowners.

Key Policy and Program Recommendations

Based on the survey findings, targeted interventions could effectively address the various gaps identified in the survey and promote energy equity statewide. The full report presents more detailed recommendations; below are some of the key recommendations.

Enhance Access to Energy Assistance Programs

Targeted Outreach Campaigns

Utilize community-based organizations, social media platforms, and direct communication channels to raise awareness about energy assistance programs.

Streamlined Application Processes

Implement user-friendly online application options and provide multilingual support to accommodate diverse populations.

Partnerships with Landlords

Establish collaborative partnerships with landlords and other multi-family providers to facilitate access to energy assistance programs for renters.

Addressing Reliability and Resilience Concerns

Infrastructure Investments

Prioritize investments in microgrids, smart technologies, and distributed energy resources to improve grid reliability and mitigate the impacts of extreme weather events.

Community Resilience Hubs

Establish a network of community-based resilience hubs equipped with backup power sources, emergency supplies, and communication systems.

Public Awareness Campaigns

Provide information about designated shelters, cooling/warming centers, and emergency contact numbers to empower communities to effectively respond to energy-related emergencies.

Promoting Clean and Energy Efficiency Options

Education and Outreach Programs

Develop educational resources and outreach programs to inform LMI households about the benefits and options of clean energy, demand response, and energy efficiency.

Financial Incentives

Provide grants, rebates, and low-interest financing options to make clean energy solutions and energy efficiency upgrades more accessible and affordable.

Community-Based Initiatives

Support community-led clean energy projects and partnerships aimed at increasing access to clean energy solutions.

Come Dream Come Build's "DreamBuild" housing program offers affordable, energy efficient, and modular housing for lower-income residents in the Rio Grande Valley.

Chapter 1: Introduction to Energy Insecurity in Texas

Energy Insecurity in Texas

Texas boasts a robust energy sector with abundant natural resources and a diverse energy portfolio. Nevertheless, disparities in access to reliable, clean, and affordable energy persist. Many Texans struggle to afford their energy bills and face challenges related to energy reliability and resilience.

Across the vast expanse of Texas, energy is more than just a utility — it is a lifeline. Yet, for many Texans, access to this lifeline is fraught with challenges.

In recent years, energy insecurity and energy equity concerns have become salient. As the Lone Star State grapples with increasingly erratic weather patterns, the pressures of a rapidly evolving energy landscape, and a growing population, addressing energy insecurity has never been more critical.

Scope and Objectives of the Report

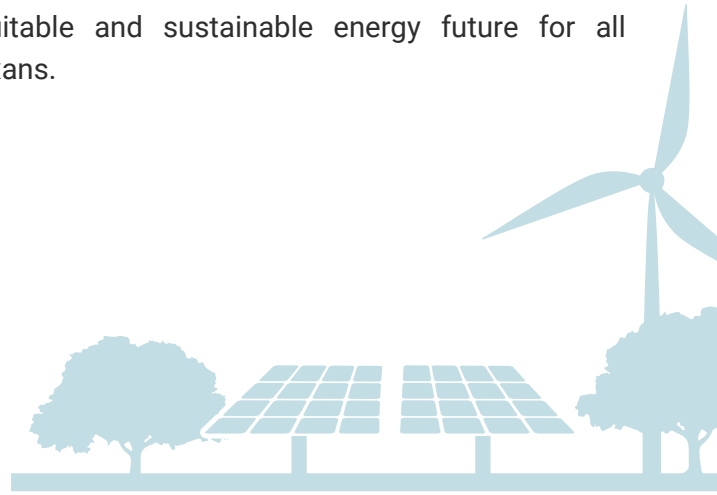
Energy insecurity, defined as "the inability to adequately meet household energy needs" [1], is a pressing issue affecting millions of households across Texas, particularly those living in low-income and marginalized communities.

This Community Voices in Energy Statewide Report aims to provide a comprehensive overview of the factors contributing to energy insecurity and other energy challenges and propose strategies for promoting equity and resilience in the state's energy system.

The objectives of this report include:

1. Understanding the energy challenges and priorities of households with low-to-moderate incomes.
2. Identifying any disproportionate energy burden or energy insecurity challenges for LMI households.
3. Providing data-driven insights to inform stakeholders such as utilities, government agencies, policymakers, and community-based organizations in developing solutions to improve energy access for Texans.
4. Maintaining an updated database on community needs, perspectives, and challenges to effectively deploy affordable, reliable, and clean energy solutions for households contending with low incomes.

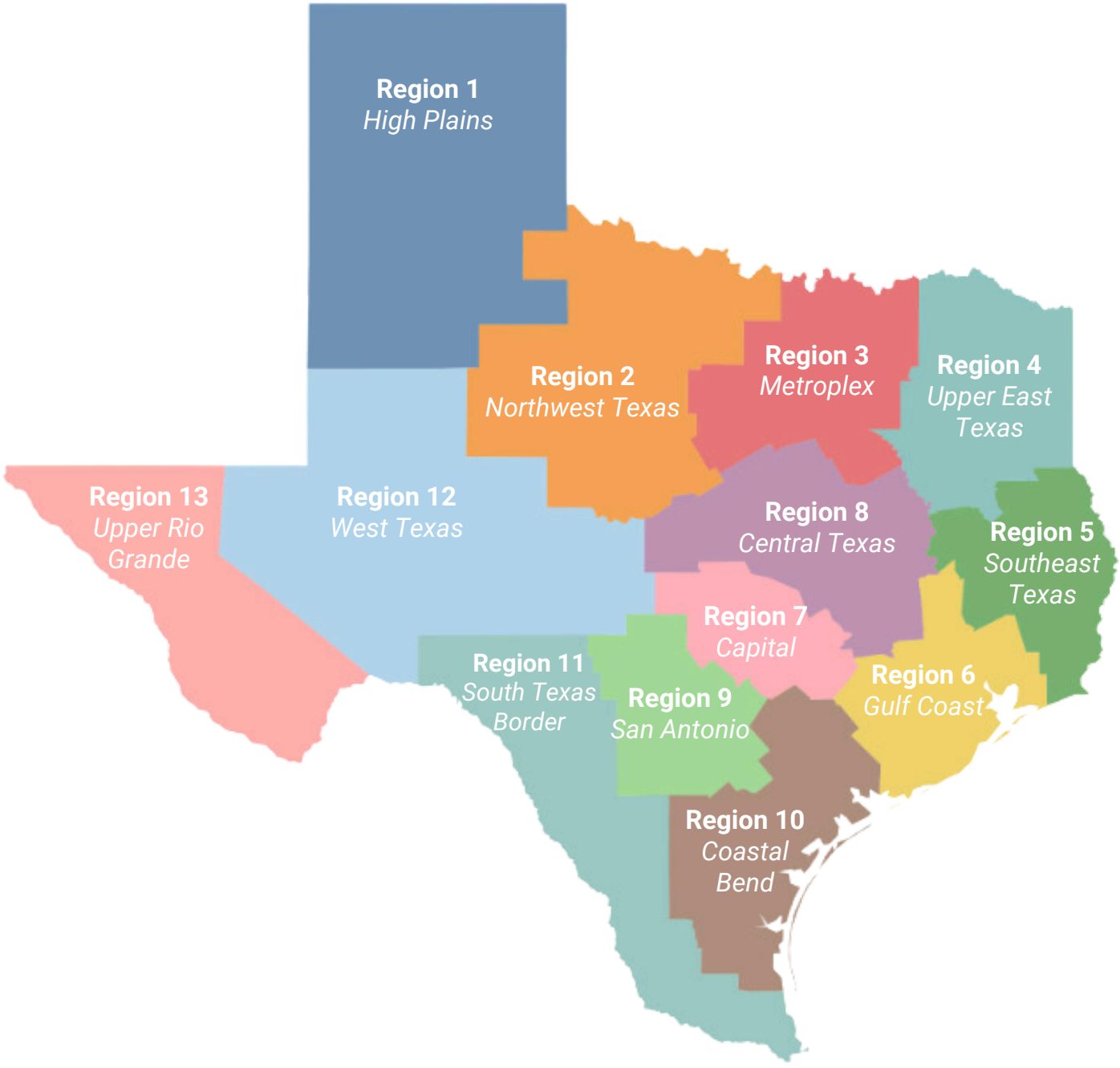
Despite the challenges posed by energy insecurity, there are increasing opportunities to address these issues with diverse stakeholder groups in Texas. By focusing on areas such as energy bill affordability, grid resilience, and clean energy solutions, stakeholders can collaborate to create a more equitable and sustainable energy future for all Texans.



Overview of the Community Voices in Energy Survey (CVES)

TEPRI conducted the Community Voices in Energy Survey (CVES) between December 2022 and March 2023 to better understand the landscape of energy insecurity in Texas. The CVES aims to gather insights from households across the 13 Uniform State Service Regions of Texas as delineated by the Texas Department of Housing and Community Affairs (TDHCA), regarding their priorities and concerns related to energy affordability, reliability, and clean energy.

Figure 1. ***The 13 regions that were surveyed correspond to the TDHCA Uniform State Service Districts.***



The results of the CVES, presented in this statewide report and the 13 regional reports, offer valuable insights into the state of energy insecurity in Texas. These findings are intended to inform decision-making processes and support the development of programs, services, and policies that address the needs of Texans who contend with low incomes.

Who Experiences Energy Insecurity in Texas?

Energy insecurity in Texas is not a uniform experience but rather a complex interplay of socioeconomic factors, geographic location, and systemic disparities. While energy insecurity affects Texans across various demographics, certain groups bear a disproportionate burden of its impacts.

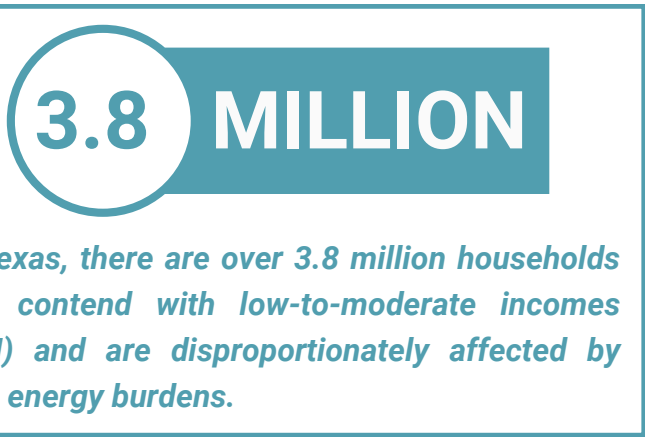
Low-to-Moderate Income Households

Of the over 10 million households in Texas, 41% fall below 80% of the state area median income (AMI) [2, 3]. The Low-Income Energy Affordability Data (LEAD) tool from the Department of Energy reveals stark disparities in energy burden among different income groups. Families with the lowest incomes, earning between 0-30% of the state's AMI, allocate an average of 12% of their income toward electricity expenses. In contrast, households with the highest incomes (above AMI) spend just 1% of their income on electricity, highlighting significant inequities in energy affordability across income brackets [4, data as of March 2024]. Refer to the supplemental pages of the report (page 63, Table 1) for the income distribution of the survey respondents.

Many families grapple with the daily reality of prioritizing energy payments over essential needs such as food, healthcare, or education. Consequently, these households often bear disproportionately high energy burdens, trapping them in a cycle of striving to afford basic utilities while also needing to meet other critical expenses.

Racial and Ethnic Disparities

Research shows that Black and Hispanic households experience disproportionately high energy burdens, spending a significant portion of their income on energy expenses compared to White households. These disparities highlight the need for targeted interventions to alleviate the financial strain on vulnerable communities.



In Texas, there are over 3.8 million households that contend with low-to-moderate incomes (LMI) and are disproportionately affected by high energy burdens.

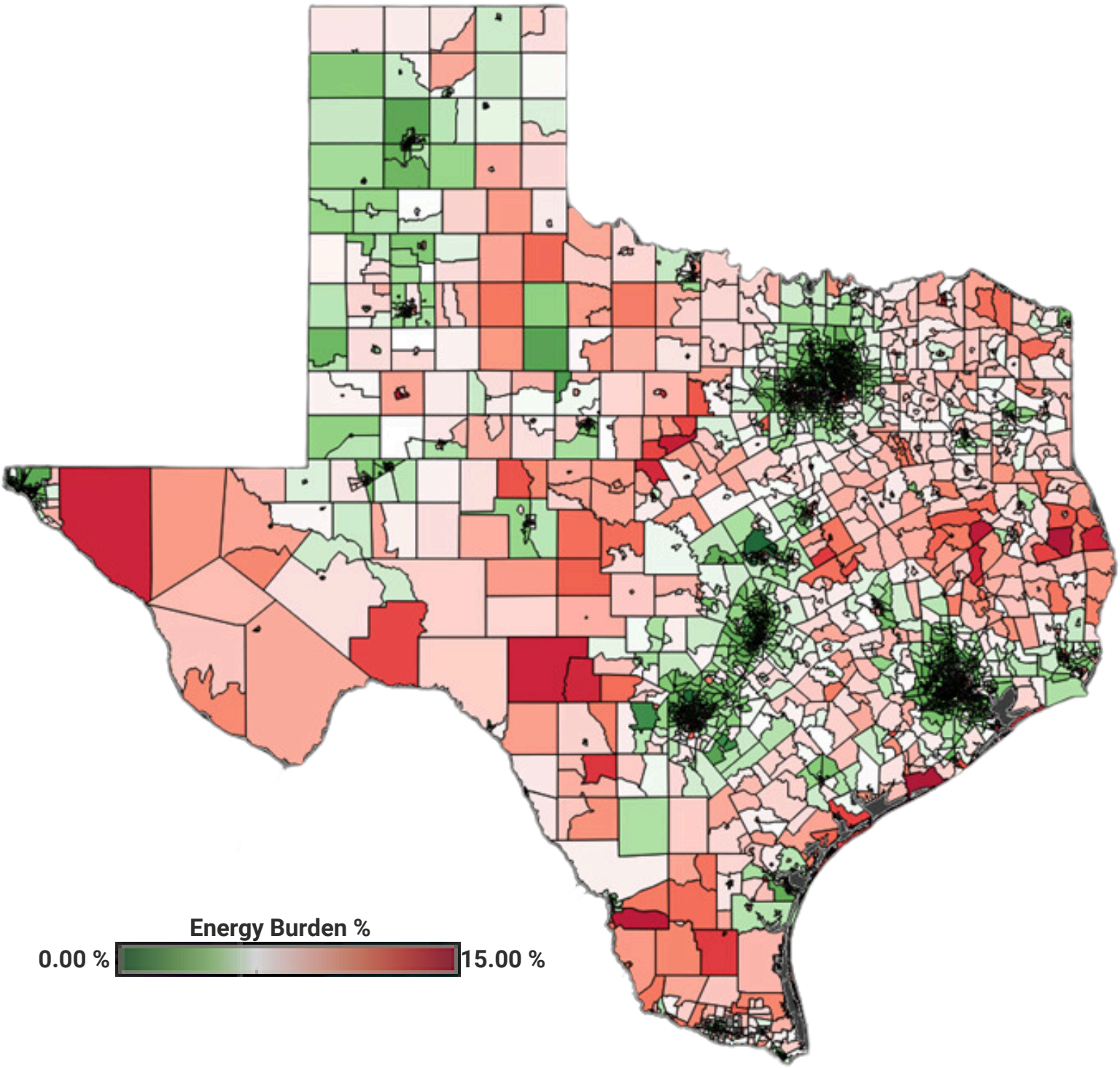
Rural vs. Urban Communities

The issue of energy affordability is significant in both rural and urban areas, but it tends to be more pronounced in rural regions due to limited access to energy efficiency programs and lower household incomes.

In rural areas, households bear a median energy burden of 4.4%, exceeding the national burden of 3.3% [5]. Low-income households residing in rural regions contend with an even higher energy burden, nearly three times greater than their higher-income counterparts [5]. This heightened energy burden poses significant challenges, making it difficult for these households to afford basic energy needs and necessitating trade-offs with other essential household expenses such as food.

Rural communities, including those in Texas, grapple with elevated energy costs relative to income levels, exacerbated by infrastructure gaps and geographic isolation, which leave them vulnerable during extreme weather events and grid disruptions. For the rural and urban distribution of respondents, see supplemental pages (Page 65, Table 5).

Figure 2. ***Energy burden by census tract.***

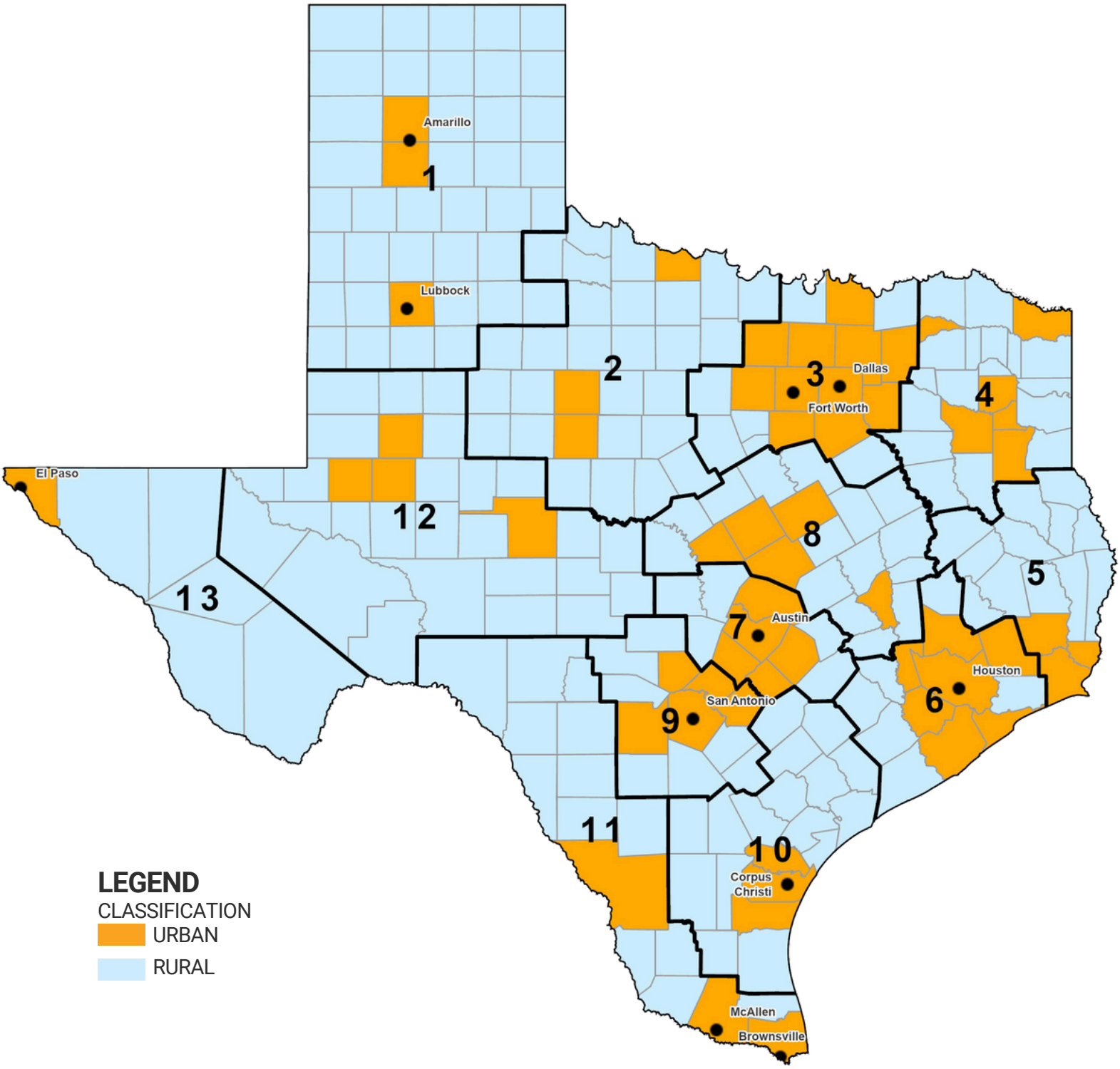


According to the Department of Energy's Low-Income Energy Affordability Data (LEAD) tool, Texas households with the lowest incomes (less than 30% of AMI) spend an average of 12% of their income on electricity expenses. In comparison, households with the highest income (above AMI) spend only 1% of their income on energy (As of March, 2024 - LEAD tool, n.d.).

Renters and Housing-Insecure Individuals

Renters and individuals facing housing insecurity confront unique challenges when it comes to energy stability. Per the 2023 Texas Department of Housing and Community Affairs (TDHCA) Annual Report, renters are disproportionately affected by various housing issues compared to homeowners. These issues include the substandard physical condition of housing units, housing cost burdens (where housing expenses exceed a certain percentage of income), and overcrowded living conditions [6].

Figure 3. ***Urban or rural classification, as determined by the State of Texas.***



Notably, low-income renters experience a higher housing cost burden compared to their homeowner counterparts, with a significant portion of their income going toward housing costs, including utilities. Refer to the supplemental pages (pages cc) for the housing tenure distribution.

The TDHCA report underscores the prevalence of housing cost burdens among low-income renters, particularly among those with very low incomes. A staggering 78.6% of very low-income renter households face housing cost burdens, highlighting the financial strain experienced by this demographic [6].

Subpar housing conditions, such as poor insulation or outdated appliances, can significantly inflate energy costs and exacerbate financial difficulties for these households.

Furthermore, renters often lack control over energy-related decisions, including the ability to make energy-efficient upgrades or access weatherization assistance programs. This lack of autonomy further compounds the challenges faced by renters in managing their energy expenses effectively.

Vulnerable Groups

Increased energy costs have a profound impact on mental and physical well-being, particularly among certain demographics such as children, the elderly, and individuals with disabilities [7, 8]. The elderly face significant housing cost burdens, where housing expenses exceed 30% of their income, forcing households to make substantial cutbacks on essential needs.

Research conducted by TEPRI suggests that households with elderly members tend to have higher energy consumption, leading to escalated energy expenses and an increased risk of energy insecurity within these households [9]. This trend is exacerbated by the prevalence of fixed incomes among the elderly, resulting in a common escalation of cost burdens with age.

Extreme Weather is a Driver of Energy Insecurity

Climate variability is increasingly impacting household energy security in Texas, with rising temperatures and extreme weather events posing significant challenges. Between 2018 and 2021, Texas documented at least 378 heat-related deaths, indicating the severity of the issue [10].

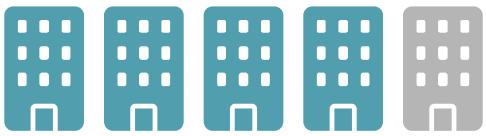
Summers in Texas are becoming longer and hotter, with projections suggesting 115 triple-digit dangerous or extremely dangerous heat days a year – an increase of more than 40 days - by 2050 [10].

Moreover, the repercussions of global warming on the Arctic can trigger southern cold snaps, exemplified by events such as Winter Storm Uri in 2021 and Winter Storm Mara in 2022. Per the Environment Texas [10] report, a 2021 study linked Arctic variability and the occurrence of Winter Storm Uri, indicating that the polar vortex is exhibiting more frequent disruptions than in previous decades. This phenomenon creates atmospheric patterns conducive to the movement of large surges of cold air into southern regions such as Texas.

Winter Storm Uri in 2021 left millions without power, disproportionately affecting urban and rural communities, with vulnerable groups facing increased risks, particularly those reliant on electricity-dependent medical equipment.

Cars damaged during Winter Storm Uri in 2021.

The summer of 2023 saw record-high levels of heat-related emergency room visits across Texas, with thousands seeking medical assistance during heatwaves [11]. It is important to note, however, that many heat-related hospital visits may be underreported. For instance, in Dallas County alone, there were 260 reported heat-related hospital visits in just two weeks in June 2023, significantly higher than the entire month of June 2022 [11]. Similarly, Hidalgo County reported that 15-20% of recent emergency room visits were heat-related, while Laredo recorded 10 heat-related deaths between June 15 and July 3 [11, 12].



260 Dallas County reported heat-related hospital visits in just two weeks in June.

Hidalgo County reported **15-20 %** of summer emergency room visits were heat-related

10 heat-related deaths in Laredo between June 15 and July 3, 2023.

Extreme weather events such as hurricanes and winter storms further compound the challenges faced by Texans. Hurricane Harvey in 2017, a Category 4 hurricane, caused extensive damage, flooding over 150,000 homes, and resulting in more than 100 deaths [13]. Storms like Tropical Storm Imelda in 2019 caused significant flooding in Harris County, flooding almost 4,000 homes - the third-largest number of homes ever flooded in a single event in Harris County) [14].

The Gulf Coast region, including counties like Harris, Galveston, and Matagorda, is particularly vulnerable to hurricanes, tornadoes, and tropical storms due to its proximity to the Gulf of Mexico. Harris County has experienced the most tornadoes in the state, with Brazoria and Galveston counties also witnessing significant tornado activity [15].

These extreme weather events not only pose immediate risks to life and property but also exacerbate energy reliability issues, especially for households with lower incomes.

With the increasing climate variability in the state, there is a likelihood of increased weather-related blackouts.

Between 2000 and 2021, there has been a 64% increase in power outages compared to the previous decade, with 83% of these incidents attributed to weather-related events [16]. In that same period, Texas experienced 12% of the 1,542 weather-related major power outages in the United States, the state with the highest number of outages in the country [16]. These major power outages, defined as events impacting more than 50,000 customers, underscore the susceptibility of Texas's energy infrastructure to extreme weather phenomena.

The State of Energy in Texas

The state of energy in Texas is characterized by a combination of abundant energy resources that make up a diverse energy portfolio including vast reserves of oil, natural gas, and coal, as well as ample sunshine and wind.

The abundance of energy resources and unique energy market have positioned Texas as a leader in both traditional and renewable energy production [17].

Natural gas accounts for the largest share of electricity generation in Texas, followed by crude oil, wind power, coal, and nuclear energy [18]. The state's abundant wind resources have made it the top wind energy producer in the country. Additionally, Texas leads the nation in installed solar capacity, harnessing the power of the sun to meet growing energy demands [19].

Texas operates its independent electricity grid, known as the Electric Reliability Council of Texas (ERCOT). The deregulated energy market in ERCOT allows for competition among electricity providers, offering consumers in 70% of the state the ability to choose their energy supplier.

While deregulation has brought benefits such as innovation and lower prices in some cases, it has also led to concerns about price volatility and disparities in service quality, particularly during extreme weather events [20, 21].

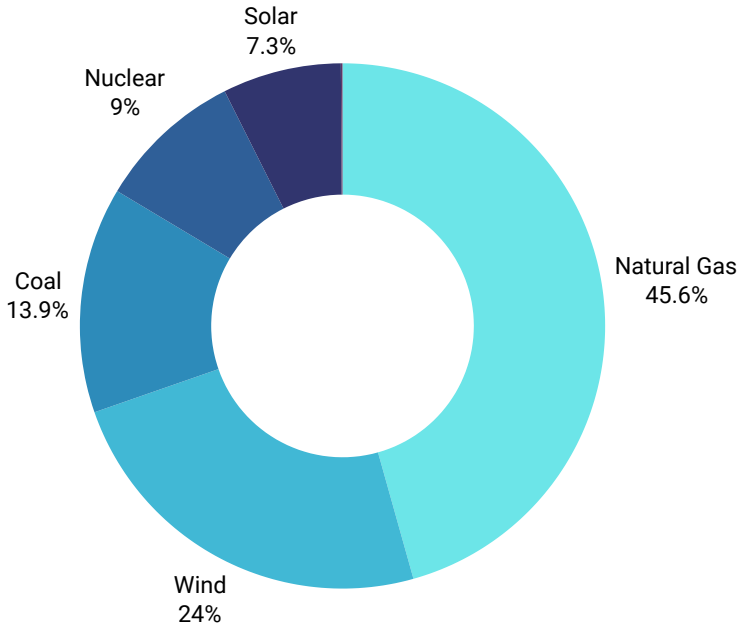
Despite its energy abundance, Texas faces significant challenges and vulnerabilities in its energy system. One key challenge is the aging infrastructure, including outdated transmission and distribution networks, which are prone to failures and disruptions, especially during extreme weather events. Winter Storm Uri, which caused widespread power outages and infrastructure failures, highlighted the fragility of Texas' energy grid and the need for resilience and preparedness.

Texas has been at the forefront of the transition to clean energy, with ambitious growth of renewable energy deployment.

However, challenges remain in balancing the integration of intermittent renewables with the reliability and stability of the grid as well as addressing equity concerns in clean energy deployment.

Texas has a long history of fostering innovation and entrepreneurship in the energy sector. The state has been a pioneer in advanced energy technologies, including smart grids, energy storage, and grid modernization. Moreover, policy initiatives such as energy efficiency programs, and research funding for clean energy innovation have helped propel Texas toward a more sustainable and resilient energy future.

The state of energy in Texas reflects a dynamic interplay of abundant resources, technological innovation, policy frameworks, and ongoing challenges. As Texas continues to navigate the complexities of its energy landscape, addressing issues of affordability, reliability and resilience, equity, and sustainability will be essential for ensuring a secure and prosperous energy future for all Texans.



Average ERCOT fuel mix as of 2023

Overview of the Report

The comprehensive findings presented in this statewide report serve as a valuable resource for stakeholders seeking to navigate the intricacies of the energy landscape in Texas.

By shedding light on the challenges faced by households with low-to-moderate incomes, these findings pave the way for informed decision-making and the formulation of targeted solutions to address key issues of energy affordability, resilience, and reliability.

Chapter 2: Energy Affordability - This chapter provides insights into the struggles faced by households in meeting their energy needs amidst financial constraints.

Chapter 3: Energy Reliability, Resilience, and the Grid - By examining the impact of electricity outages, this chapter highlights areas where improvements are needed to enhance the resilience of the energy infrastructure.

Chapter 4: Clean Energy Access and Interest - This chapter offers insights into the attitudes and preferences of households towards clean energy initiatives, laying the groundwork for the adoption of sustainable practices.

Chapter 5: Gaps, Opportunities, and Recommendations - By synthesizing the findings, this chapter offers actionable recommendations for policymakers and program developers to drive positive change.

Chapter 6: Conclusion - This chapter summarizes the key takeaways and emphasiizes the importance of addressing energy challenges holistically and equitably. It underscores the urgency of collaborative efforts to ensure that all Texans can access affordable, reliable, and sustainable energy resources.

Chapter 2: Energy Affordability in Texas

The statewide survey results reveal the significant impact of energy expenses on households with low-to-moderate incomes. The findings highlight the challenges faced by vulnerable demographics such as the elderly and those residing in rural or less accessible areas. The survey findings also illuminate various aspects of accessibility to energy assistance to help address energy affordability challenges.

Annual Household Income	Income Categories
Less than $13,000	Extremely Low Income
$13,000 - $27,000	Very Low Income
$27,000 - $50,000	Low Income
$50,000 - $80,000	Moderate Income
Over $80,000*	High Income

Table 1. Respondents reported annual incomes are grouped into the following income categories.

These challenges often force households to make difficult choices, occasionally sacrificing necessities like food and basic comforts like entertainment and clothing, which in turn have profound implications for their health and overall well-being.

The survey findings indicate that a significant portion of respondents across the state face challenges with affording their energy bills. Roughly **40% of participants find their energy bills to be unaffordable,** while about 50% perceive them as manageable. Moreover, **24% strongly agree and 25% agree that they struggle to meet their energy expenses most months.**

Households earning less than $27,000 annually encountered the most difficulty in paying their electricity bills regularly. **Nearly 70% of respondents earning below $13,000 annually report struggling to cover their bills most months**, with 56% of those earning between $13,000 and $27,000 annually experiencing similar challenges (Figure 4). In contrast, a smaller proportion of respondents with higher incomes face such difficulties, with 44% of those earning $27,000 to $50,000 annually, 28% of those earning $50,000 to $80,000 annually, and 26% of those with incomes exceeding $80,000 annually reporting struggles to pay their energy bills most months.

Access to affordable energy is essential for ensuring equitable opportunities and outcomes for all individuals, regardless of income level. The disparities in energy affordability across income groups underscore broader concerns related to energy equity and access.

Supporting the earlier findings, certain regions notably stand out in terms of challenges with bill payment. The High Plains (Region 1), Gulf Coast (Region 6), Capital (Region 7), and South Texas Border (Region 11) exhibit particularly high percentages of respondents facing difficulties, with 68%, 64%, 60%, and 62%, respectively, reporting struggles to pay their bills most months.

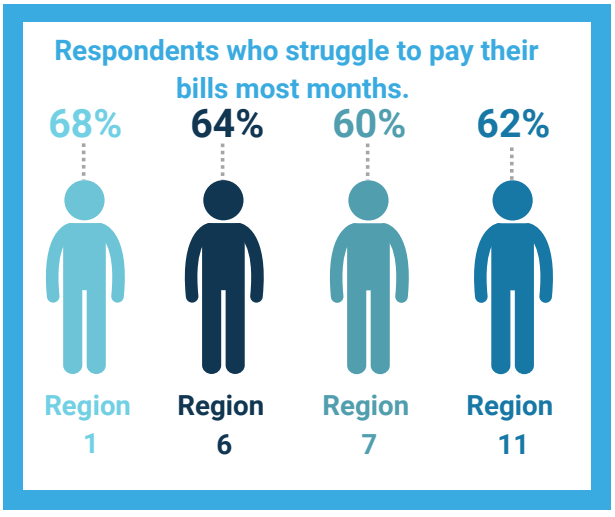
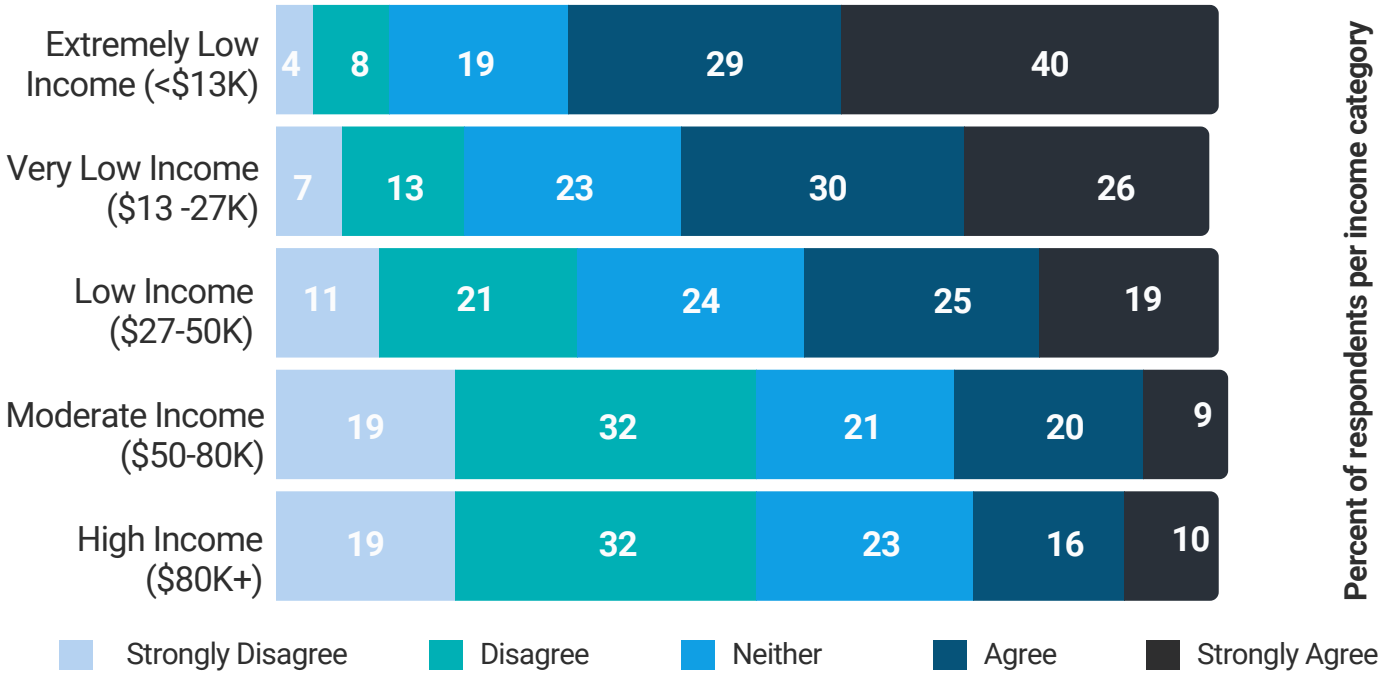


Figure 4. **The lowest income groups struggle the most to afford their monthly energy bills.**



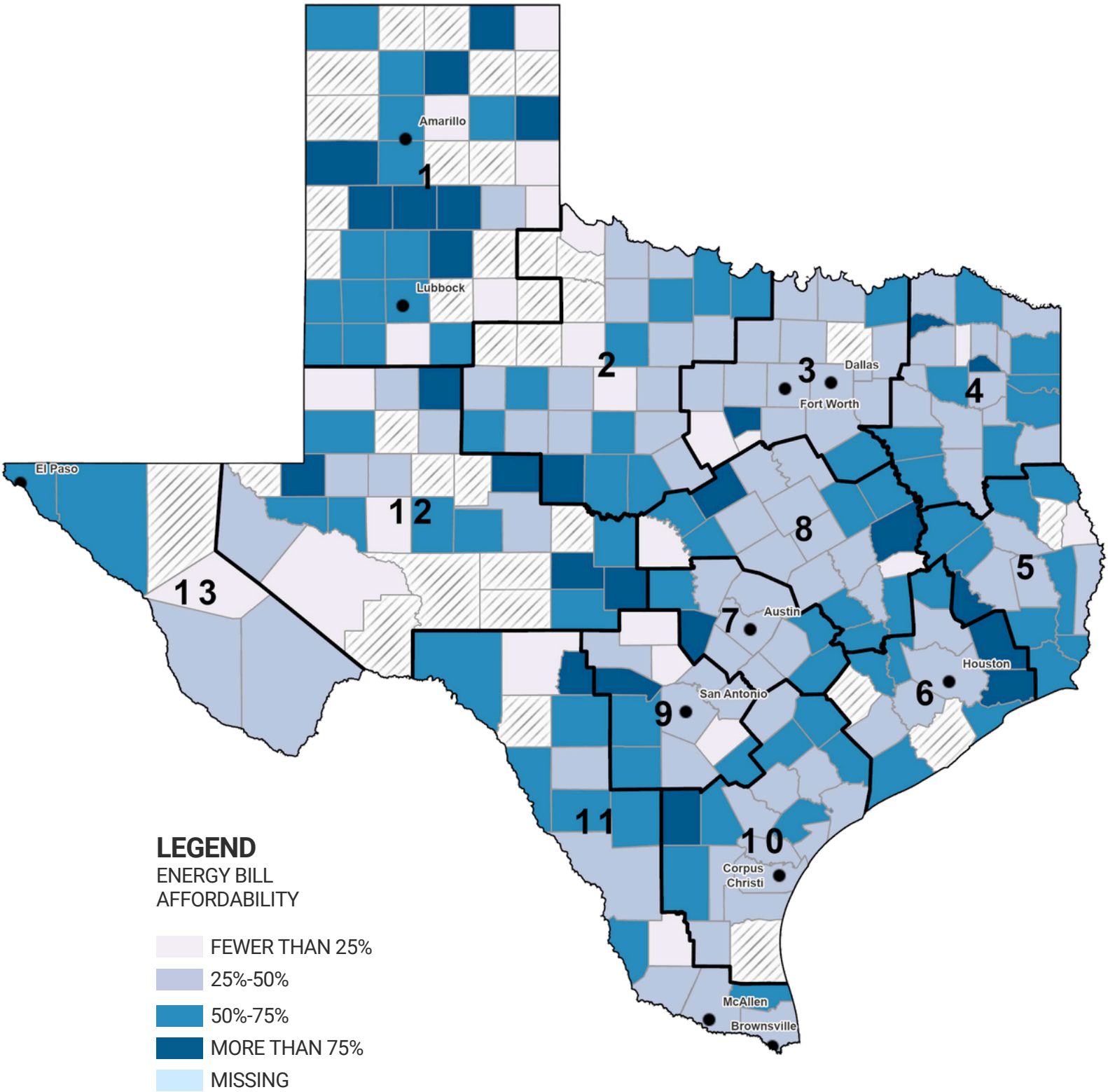
Energy Affordability Disparities

Disparities in energy insecurity further exacerbate the challenges faced by low-income, rural, and households of color in Texas. The survey findings underscored a disproportionate burden of energy insecurity, with certain demographic groups and communities bearing a heavier weight.

Rural vs. Urban Communities

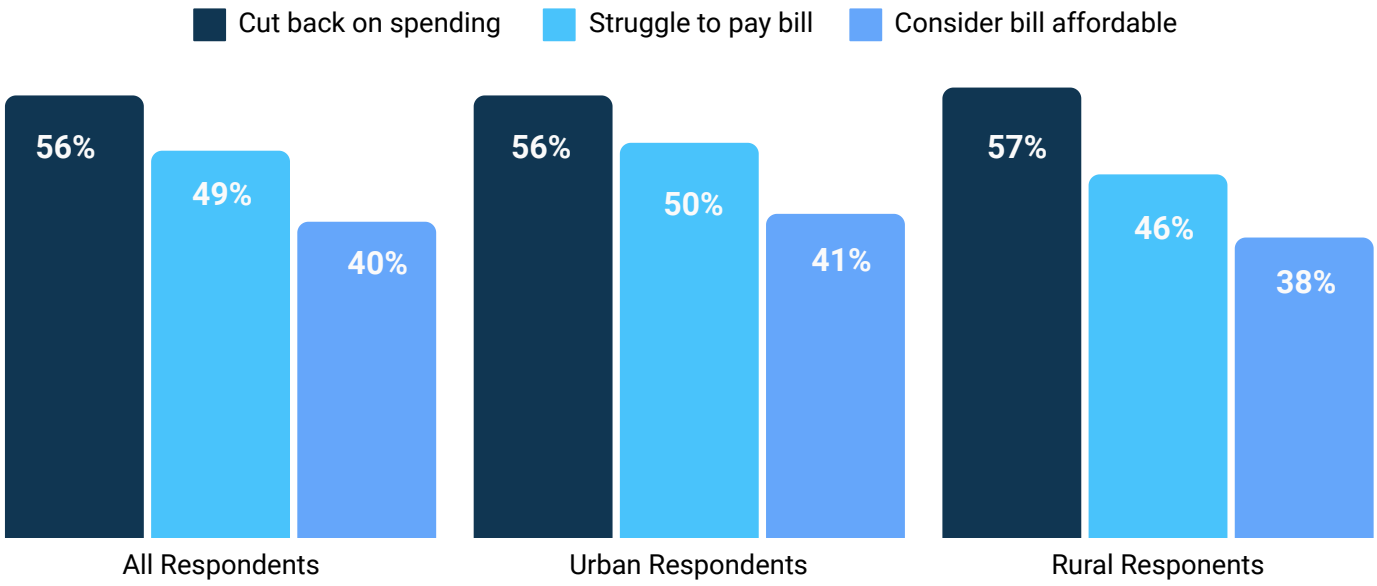
Beyond income, the survey underscores the significant role of race/ethnicity in shaping perceptions of energy affordability. Research reveals significant disparities in energy burdens among Black and Hispanic households, who tend to allocate a larger portion of their income towards energy expenses compared to White households. This trend is evident across multiple regions, notably in Northwest Texas, Upper East Texas, Capital, Central Texas, and San Antonio (Regions 2, 4, 7, 8, and 9 respectively), where **a higher percentage of respondents from ethnic or racial backgrounds report having to cut back on household essentials, struggling to pay their bills, or finding their bills unaffordable.**

Figure 5. ***Percentage of respondents who do not consider their bill to be affordable, by county.***



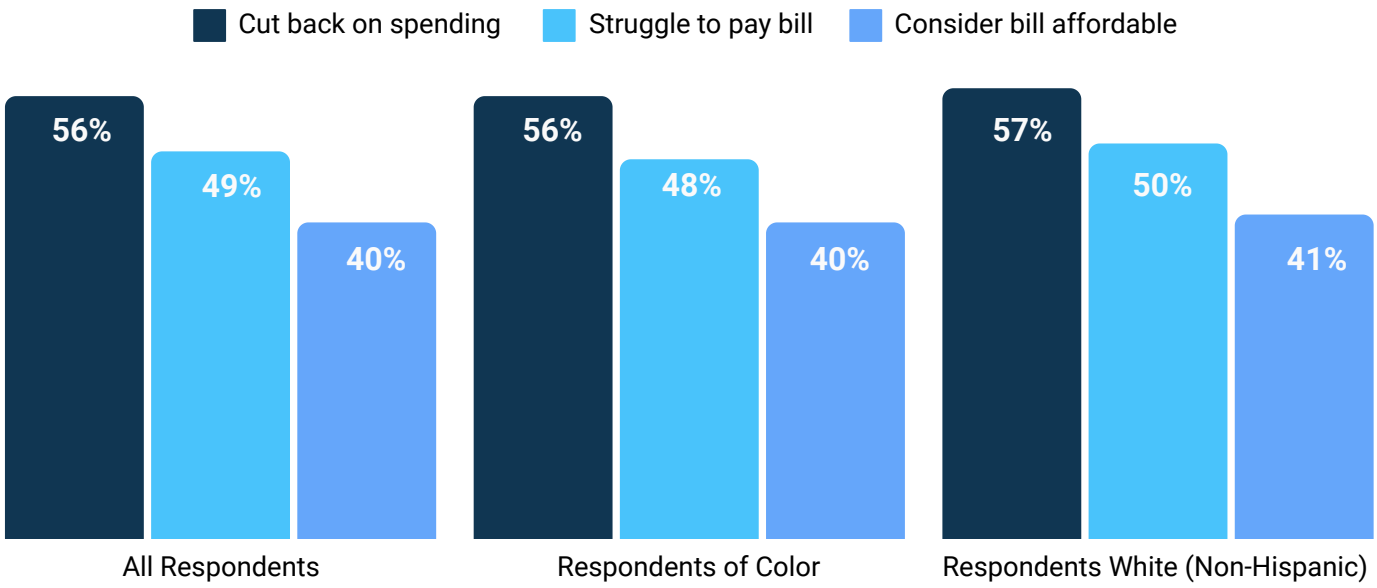
For instance, in Northwest Texas (Region 2), 65% of respondents from racial/ethnic groups indicate cutting back on essential needs, contrasting with 53% of White (non-Hispanic) respondents facing similar circumstances. Similarly, in Upper East Texas (Region 4), 63% of respondents from minority groups, compared to 59% of White (non-Hispanic) respondents, report having to cut back on essential goods to meet their energy expenses.

Figure 6. ***Rural/urban distribution of the difficulty paying monthly energy bills.***



However, at the statewide level, respondents of color in Texas exhibit a lower likelihood than White (non-Hispanic) respondents to perceive their energy bills as unaffordable, reduce spending on essential goods to pay their energy bills or struggle with energy bill payments.

Figure 7. ***Racial/ethnicity distribution of the difficulty paying monthly energy bills.***



Home Tenure

The survey findings highlight the significant effect of housing tenure on the perceptions of energy affordability among households with low-to-moderate incomes. Among the reported types of tenure – owner, renter, and 'other' – renters are notably more inclined to report their energy bills as unaffordable and face challenges in paying them consistently.

The survey findings indicate that **44% of renters across the state perceive their energy bills as unaffordable compared to 36% of homeowners and 37% of respondents with 'other' types of home tenure,** which may include those residing with family or friends, or those not paying rent.

Additionally, **56% of renters struggle to pay their bills most months, surpassing both homeowners (39%) and respondents with 'other' home tenure (46%).** This trend persists across various regions, with exceptions noted in Upper East Texas (Region 4) where over half of the respondents with 'other' home tenure (51%) find their bills unaffordable compared to 47% of renters and 34% of homeowners.

In West Texas (Region 12), 41% of 'other' respondents face affordability challenges, compared to 38% of renters and 37% of homeowners.

While the survey did not directly assess home conditions or evaluate the presence and quality of energy efficiency systems or weatherization, it is crucial to acknowledge broader housing disparities.

Rental units, often older and smaller, tend to be less energy-efficient than owner-occupied homes [5, 22]. A 2020 ACEEE report on U.S. national and metropolitan energy burdens highlights that families residing in homes constructed before 1980 face elevated energy burdens [23].

In Texas, 44% of homes were constructed before 1980 [24]. It is worth noting that the majority of the housing stock in Texas was built in the 2000s (17%), 1970s (16%), and 1980s (16%) [24].

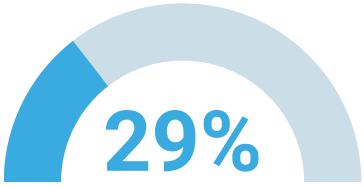
Research also indicates that on average across the U.S., **"rental buildings consume 20% more energy per square foot than owner-occupied buildings"** [25]. This phenomenon is driven in part by a split incentive problem where the party investing in energy-saving measures, typically the building owner does not directly benefit from the resulting reduction in energy costs, which are instead enjoyed by the tenant or end user. As a result of the split incentive problem, landlords may lack incentives and interest to improve home efficiency and tenants may not have the agency that makes such investments tenable [25].

Tradeoffs to Afford Energy Bill

People who experience difficulties paying their energy bills are at higher risk of making cutbacks to essential household needs which can have severe health consequences such as exacerbated health complications from hot or cold indoor temperatures. These tradeoffs include cutting back on clothing and entertainment and, in more extreme cases, food, and keeping homes at uncomfortable temperatures.

> **Energy insecurity is not isolated; it intertwines with broader structural inequalities, forcing households to make difficult trade-offs between essential needs and energy expenses. From sacrificing household necessities to facing potential disconnections, the impacts of unaffordable energy extend far beyond the bill itself, shaping daily lives and exacerbating existing vulnerabilities.**

The survey asked respondents what basic household needs they cut back spending on to afford electricity to assess the implication of energy burden on their household needs. The statewide results reveal that a significant portion of respondents make significant sacrifices to afford their electricity bills. **Nearly half of the respondents (48%) resort to cutting back on entertainment, while 45% prioritize their electricity expenses over clothing purchases.**



More than a quarter (29%) of respondents reduce spending on food to meet their electricity needs.

Additionally, households often face the tough decision of trading off other essential utilities and bills such as rent, phone bills, and internet services to ensure they can afford their energy expenses. Households with children are particularly impacted, as many have to cut back on critical expenses like childcare, school-related costs, and after-school programs as illustrated in Figure 8.

While the data indicates that **households with annual incomes below $50,000 are less likely to curtail entertainment expenses, they exhibit a higher likelihood than their higher-income counterparts to reduce spending on other essential household needs, such as transportation, internet bills, rent, and phone bills,** as illustrated in Figure 9. This underscores the economic strain experienced by lower-income households, who must navigate a complex web of trade-offs to manage their energy expenses while meeting other basic needs.

Tradeoffs with Indoor Cooling

Texas is known for its high temperatures, particularly during the summer months. In the summer of 2023, the state faced an unprecedented heatwave, marked by record-breaking temperatures hat began in early June and ran through August, resulting in numerous fatalities and hospitalizations [11, 12].

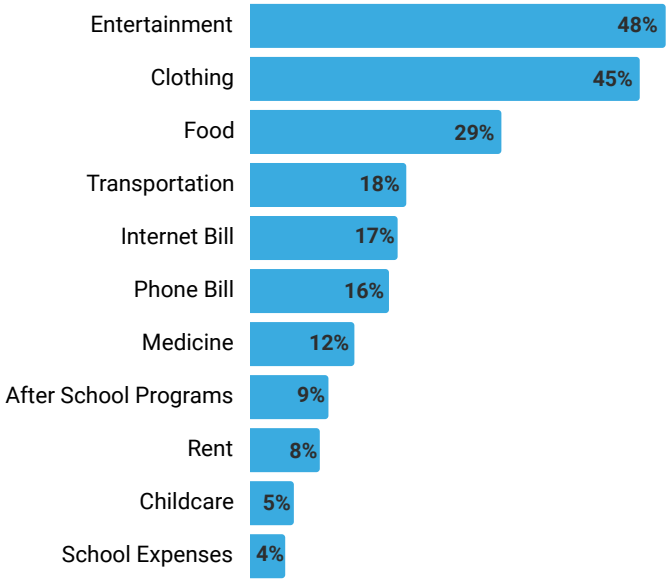


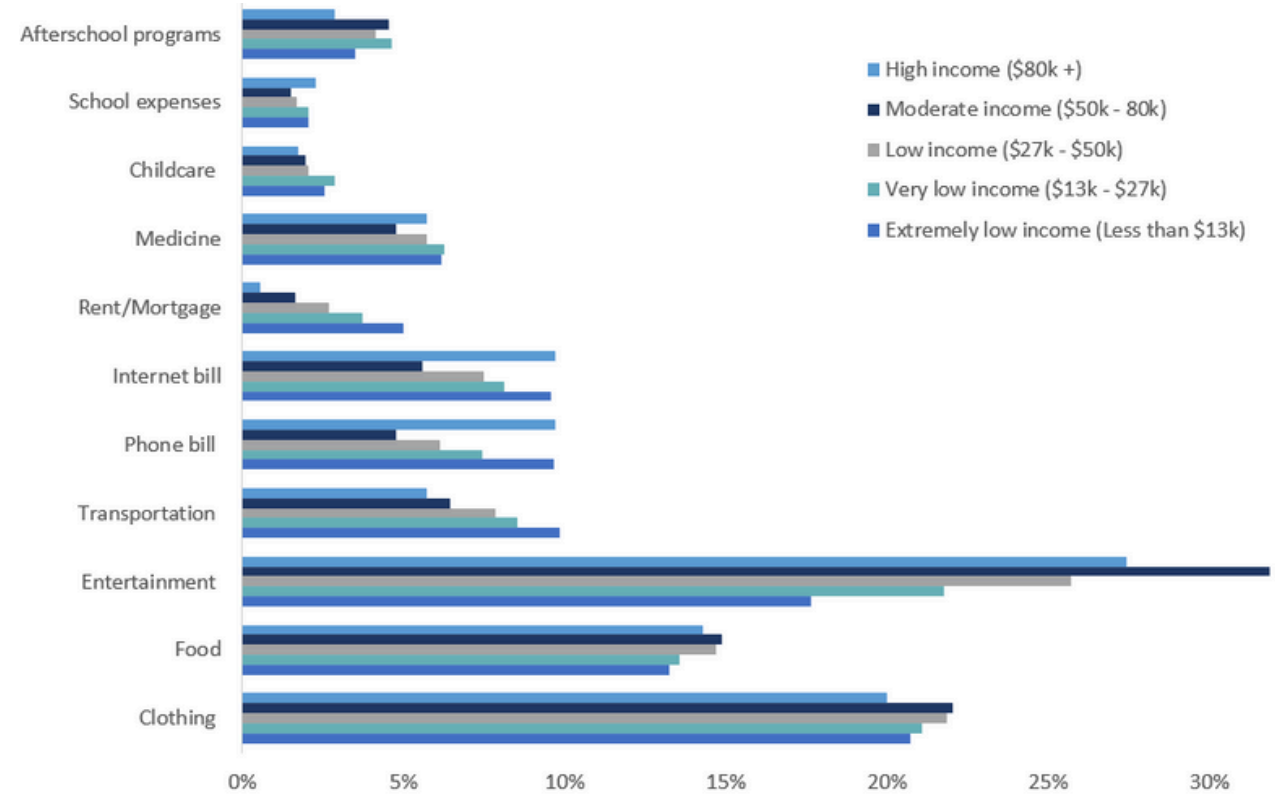
Figure 8. ***Respondents primarily cut back on entertainment, clothing, and food to afford their monthly energy bills.***

The combination of extreme heat and high humidity poses significant health risks, as evidenced by the 23 recorded deaths in the Gulf Coast (Region 6) alone during the summer of 2023 [26].

Survey findings underscore the financial and health strain that is exacerbated by such high-temperature conditions, revealing that **approximately 27% of respondents across the state resort to completely shutting off their air conditioning during summer months to alleviate costs.** Furthermore, this figure spikes to 36% for those who opt to endure uncomfortable thermostat settings in a bid to reduce electricity expenses.

Specifically, in the High Plains (Region 1, 31%) and the Upper Rio Grande (Region 13, 36%), where temperatures can soar over 97 degrees Fahrenheit [27, 2023 summer data] during the summer months, the percentage of respondents who resort to turning off their air conditioning exceeds the statewide average. Similarly, respondents from the High Plains (42%), Upper East Texas (Region 4, 42%), and Southeast Texas (Region 5, 38%) surpassed the statewide average for those who opt to endure uncomfortable thermostat settings in the summer.

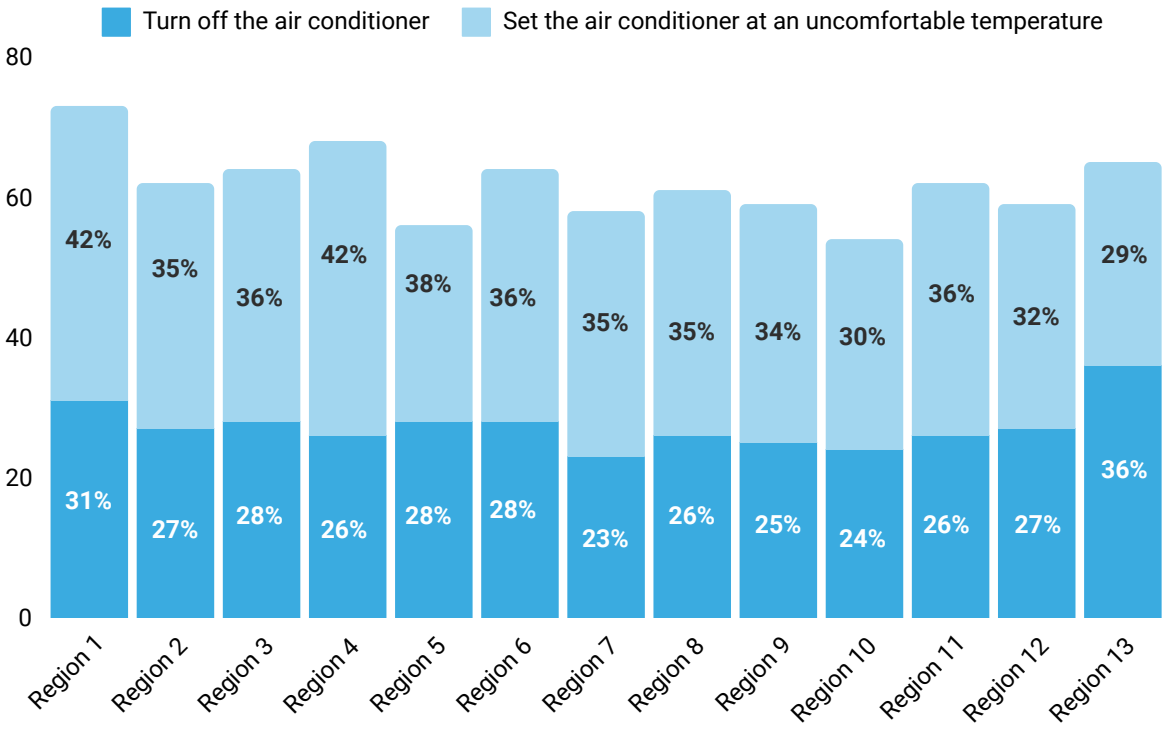
Figure 9. ***The lower income respondents make the most tradeoffs of necessities and basic comforts.***



Cooling Tradeoffs across Vulnerable Groups

Turning off the air conditioner or adjusting the temperature to a higher setting during hot days disproportionately impacts vulnerable demographics, such as the elderly, children, and individuals with pre-existing health conditions. These groups are especially prone to experiencing indoor heat stress.

Figure 10. ***Almost 2 out of 3 respondents turn off or set their air conditioner/thermostat to uncomfortable temperatures in the summer.***



Statewide Average: **36%** of respondents statewide set their AC to **an uncomfortable** temperature in the summer to save money.

Statewide Average: **27%** of respondents statewide **turn off** their A.C. in the summer to save on energy costs.

Based on the survey results, cooling-related trade-offs demonstrate intricate trends among vulnerable demographics. Specifically, households with children (only) are more inclined to switch off their air conditioners compared to those without vulnerable members. In contrast, households with elderly members (only) are less likely to turn off their air conditioners but tend to adjust the temperature settings more frequently.

The survey data indicates that **approximately 18% of households with at least one member over 64 years old opt to turn off their air conditioner in the summer to save money. In contrast, this figure rises to 30% for households with at least one member under 18 years old (minors), while 28% of respondents with neither vulnerable group** represented in their household choose this coping strategy (Figure 11).

Moreover, over a third of households (39%) with at least one elderly member reported setting the temperature to an **uncomfortable level during the summer,** highlighting their propensity to adjust thermostat settings rather than resorting to turning off the air conditioner. **Similarly, 36% of households with minors choose this option, while 33% of households without vulnerable groups make the same choice.**

The survey findings underscore the complex dynamics of cooling tradeoffs within vulnerable groups, suggesting that while households with minors are more inclined to turn off their air conditioner, those with elderly members are more likely to adjust temperature settings, reflecting distinct coping mechanisms based on household composition and vulnerability factors.

Cooling Tradeoffs Across Income Groups

Across various income categories, the trend indicates that individuals in the lowest income groups are more inclined to turn off their air conditioners or adjust their thermostats during the summer months to save money. This pattern is particularly pronounced among lower-income brackets, where respondents with lower annual household incomes are more likely to employ such cost-saving measures.

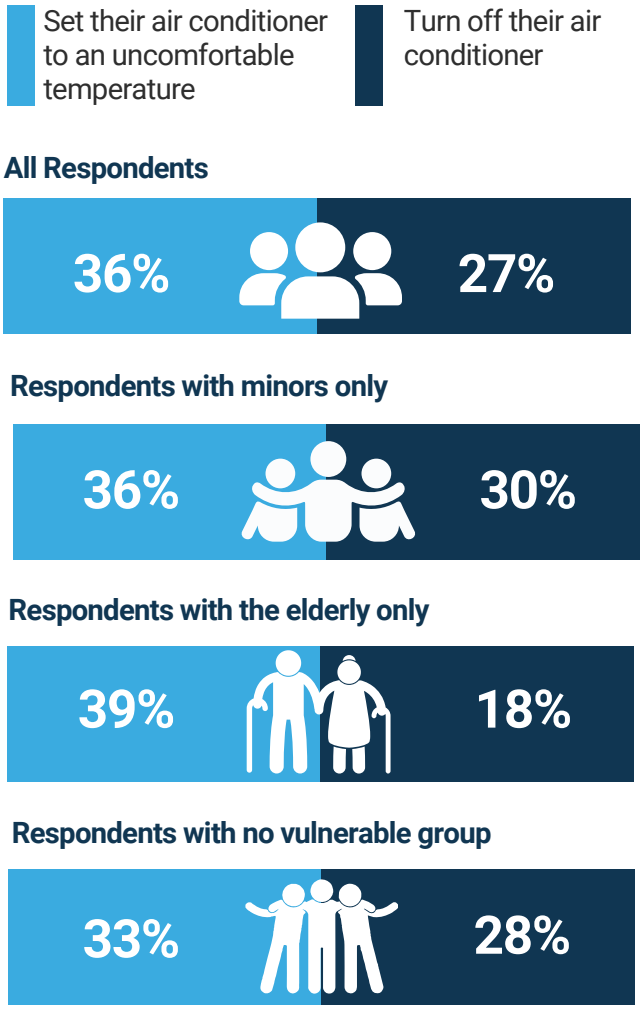


Figure 11. ***More than a third of respondents with vulnerable household members set the temperature to an uncomfortable level in the summer to afford their energy bills. Almost a third of households with only minors turn off their air conditioners off to afford their monthly energy bills.***

For instance, 33% of respondents earning less than $13,000 annually reported turning off their thermostats, followed by 29% of those with annual household incomes ranging from $13,000 to $27,000. This percentage gradually decreases, with **only 12% of respondents in higher income**

brackets resorting to turning off their air conditioner or adjusting their thermostat in the summer to reduce their electricity expenses.

More respondents reported setting the temperature of their air conditioner to an uncomfortable level rather than turning it off completely. Similar to the behavior of households with elderly members, setting the temperature to an uncomfortable level is a more tolerable and affordable coping strategy to save energy compared to completely turning off the air conditioner.

Table 2. ***Responses by income group to "I turn off my air conditioner/thermostat in the summer to reduce my electricity bill and save money."***

Income Group	No	Yes	Total
Less than $13,000	**67%** (1097)	**33%** (531)	**100%** (1628)
$13,000 – $27,000	**71%** (1179)	**29%** (483)	**100%** (1662)
$27,000 – $50,000	**74%** (1230)	**26%** (431)	**100%** (1661)
$50,000 – $80,000	**81%** (909)	**19%** (217)	**100%** (1126)
$80,000+	**88%** (115)	**12%** (16)	**100%** (131)

Tradeoffs with Indoor Heating in the Winter

Texas typically experiences mild winters. Nevertheless, there are occasions when the state encounters cold snaps, with temperatures dropping below 32 degrees Fahrenheit [28] in some parts of the state. Notable examples include Winter Storm Mara in late January 2023 and Winter Storm Uri in 2021.

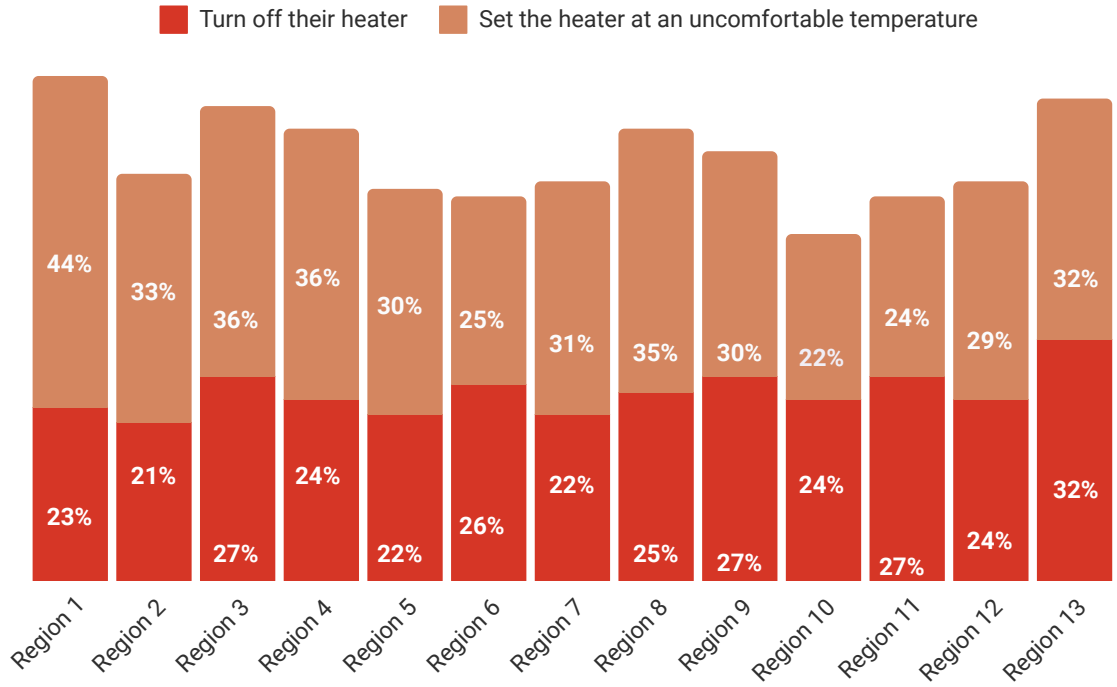
Table 3. ***Responses by income group to "I turn off my air conditioner/thermostat in the summer to reduce my electricity bill and save money."***

Income Group	No	Yes	Total
Less than $13,000	**66%** (1078)	**34%** (550)	**100%** (1628)
$13,000 – $27,000	**64%** (1071)	**36%** (591)	**100%** (1662)
$27,000 – $50,000	**62%** (1029)	**38%** (632)	**100%** (1661)
$50,000 – $80,000	**65%** (728)	**35%** (398)	**100%** (1126)
$80,000+	**69%** (90)	**31%** (41)	**100%** (131)

Survey results underscore that **approximately 25% of all respondents across the state resort to completely turning off their heaters/thermostats during winter periods to reduce costs.** Furthermore, the percentage increases to **31% – nearly one-third of all respondents – for those who choose to set their thermostat to uncomfortable levels to save on electricity expenses.**

In six regions, notably High Plains and Upper Rio Grande (Regions 1 and 13), the proportion of respondents setting their heaters to uncomfortable levels during winter exceeds the statewide average. Conversely, the number of respondents opting to completely turn off their heaters generally aligns with the state average, with Region 13 reporting the highest percentage of such respondents (32%).

Figure 12. ***Almost 2 out of three respondents either turn off their heater or set it to uncomfortable temperatures in the winter. Many of the regions have respondents that do this above the statewide average.***



Statewide Average: 31% of respondents statewide set their heater to **an uncomfortable** temperature in the winter to save money.

Statewide Average: 25% of respondents statewide **turn off** their heater in the winter to save on energy costs.

Figure 13. ***Households with vulnerable groups are more inclined to set their heaters to uncomfortable temperatures, while those without vulnerable members are more likely to turn off their heaters.***

Heating Tradeoffs across Vulnerable Groups

Similar to the impacts of heat stress, cold stress particularly affects vulnerable individuals such as the elderly, children, and individuals with pre-existing health conditions, especially increasing the risk of respiratory symptoms [29]. However, **fewer respondents in these vulnerable groups opted to forego heat in the winter compared to cooling in the summer.**

The survey identified that households with members over 65 years old and those under 18 years old were more inclined to set their heaters to uncomfortable temperatures. **Over a third of respondents (36%) with at least one elderly household member chose to set the temperature in the winter to an uncomfortable level, compared to 30% with minors, and 31% of respondents with neither vulnerable group.**

However, **households without vulnerable members were more likely to turn off their heaters compared to those with minors and those with the elderly.** Approximately 17% of respondents with at least one household member over 64 years old the elderly)

(opted to turn off their heaters in the winter to save money, compared to 26% with at least one household member under 18 (minors), and 29% of respondents with neither vulnerable group in their household.

Heating Tradeoffs Across Income Groups

Across all income categories, **60% of respondents with the lowest annual household incomes (less than $27,000) opt to turn off their heaters/thermostats in the winter to save on monthly energy bills.** This trend indicates a tendency among households with lower incomes to resort to such cost-saving measures.

Table 4. ***Responses by income group to "I turn off my heater/thermostat in the winter to reduce my electricity bill and save money."***

Income Group	No	Yes	Total
Less than $13,000	**72%** (1168)	**28%** (460)	**100%** (1628)
$13,000 – $27,000	**68%** (1124)	**32%** (428)	**100%** (1662)
$27,000 – $50,000	**75%** (1247)	**25%** (414)	**100%** (1661)
$50,000 – $80,000	**79%** (890)	**21%** (236)	**100%** (1126)
$80,000+	**85%** (112)	**15%** (19)	**100%** (131)

Energy Assistance

Addressing energy affordability issues requires comprehensive policy solutions that target the root causes of financial hardship. This may include measures to improve energy efficiency, expand access to renewable energy sources, and implement targeted assistance programs for low-income households.

Table 5. ***Responses by income group to "I set my heater/thermostat at an uncomfortable temperature in the winter to reduce my electricity bill and save money."***

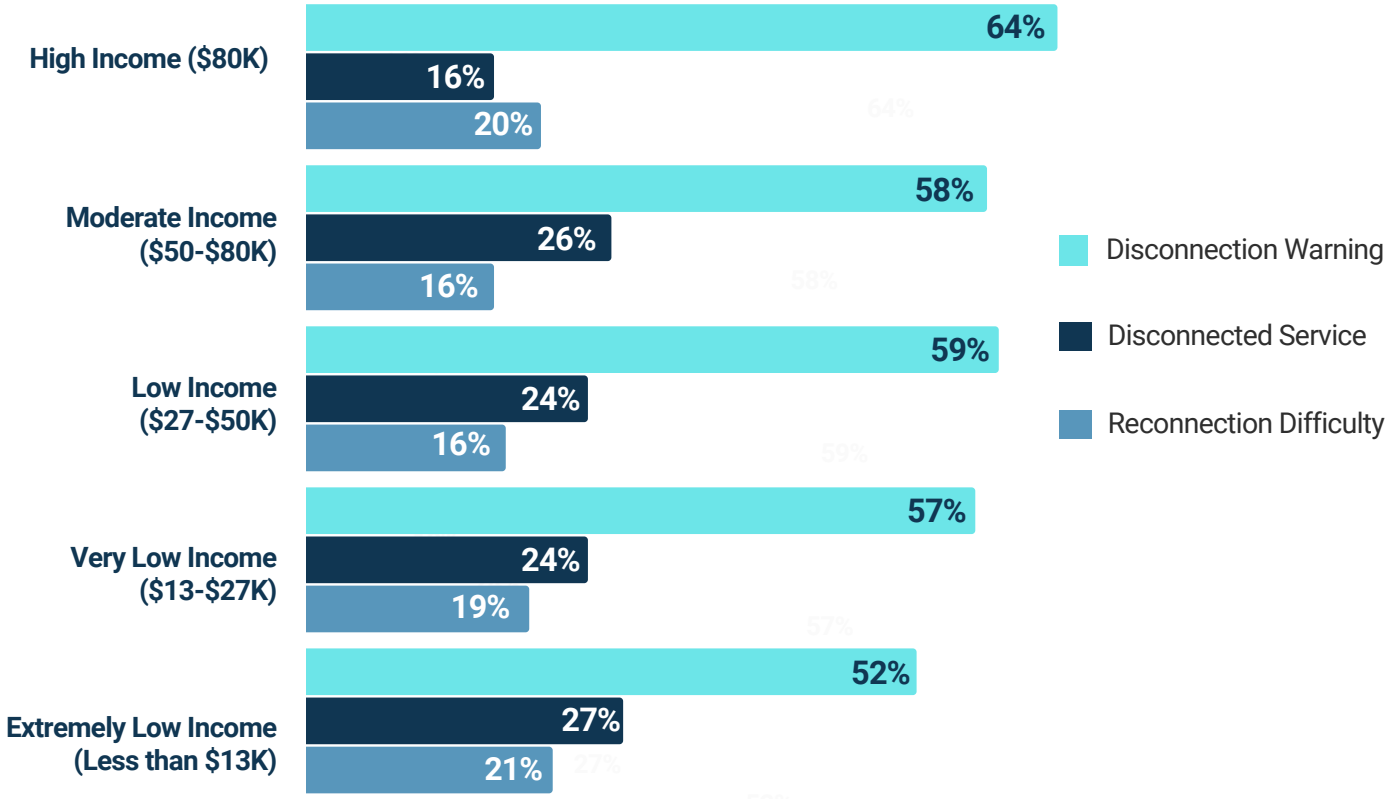
Income Group	No	Yes	Total
Less than $13,000	**72%** (1166)	**28%** (462)	**100%** (1628)
$13,000 – $27,000	**66%** (1123)	**34%** (539)	**100%** (1662)
$27,000 – $50,000	**66%** (1104)	**34%** (557)	**100%** (1661)
$50,000 – $80,000	**68%** (768)	**32%** (358)	**100%** (1126)
$80,000+	**77%** (106)	**23%** (30)	**100%** (131)

Prevalence of Disconnections

The survey sought to understand instances of electricity disconnections and disconnection warnings to better understand energy affordability needs. Survey participants were asked to report if they received disconnections and/or disconnection warnings and if they had difficulty being reconnected after a disconnection.

In the year preceding the survey, **27% of respondents reported receiving notices regarding potential electricity shutoffs due to non-payment.** While disconnection warnings increased with higher incomes, the lower-income categories were

Figure 14. ***Electricity service disconnection warnings decreased with higher incomes, and the lower-income categories were the most likely to experience service disconnections.***



the most likely to experience disconnections. This trend only differed for respondents with moderate incomes (annual household income of $50,000 to $80,000), where 26% experienced disconnections, slightly surpassing the rates for 'low' and 'very low' income categories. **Nonetheless, the majority of respondents who experienced disconnections (76%) had annual household incomes of $50,000 or less.**

Although disconnections affected a relatively small proportion of respondents (12%), the prevalence of non-payment warnings raises concerns about affordability and financial strain, indicating tight family budgets. Moreover, approximately 9% of respondents found it challenging to restore their electricity service post-disconnection, suggesting difficulties in settling overdue bills and associated penalties for reconnection (Figure 14).

Participation in Energy Assistance Programs

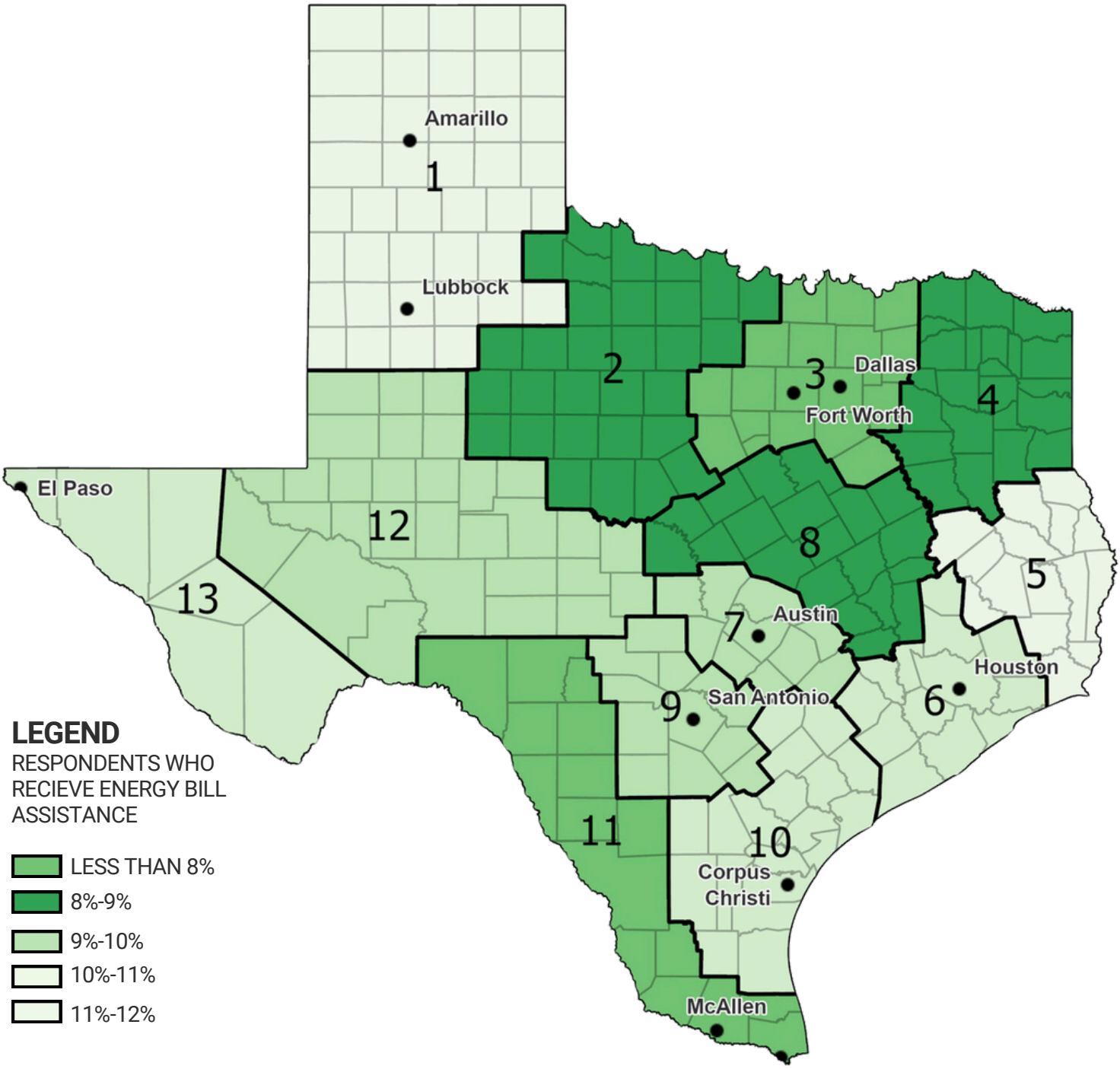
Survey participants were asked whether they received financial aid for electricity bills from bill assistance programs, including those funded by the Comprehensive Energy Assistance Program (CEAP)*. The Texas CEAP program aims to assist specific groups, including households whose income is equal to or less than 150% of the Federal Poverty Level ($46,800 for a family of four at the time of writing). Priority is given to households with the highest energy burden, the elderly, people with disabilities, households with young children, and households with significant energy consumption.

Statewide, only 10% of respondents (595 out of 6209) indicated receiving energy assistance from community or utility programs. Moreover, a significant majority of respondents across various income brackets, including

**CEAP is funded by the Low-Income Home Energy Assistance Program (LIHEAP)*

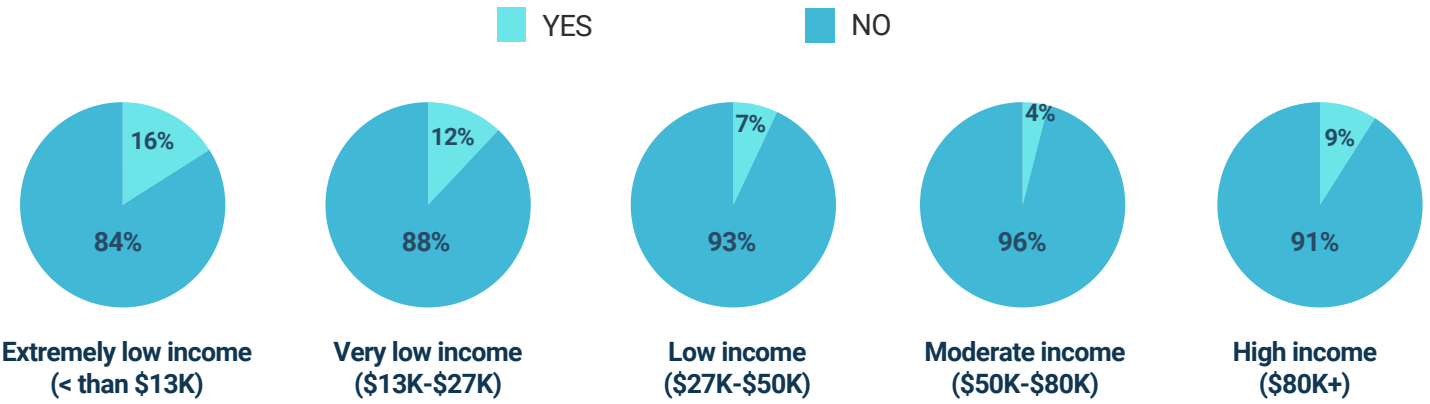
84% with annual household incomes below $13,000, 88% with incomes between $13,000 and $27,000, and 93% with incomes between $27,000 and $50,000, reported not receiving energy assistance despite likely meeting eligibility criteria.

Figure 15. ***Distribution of energy bill assistance by region.***



Although the prevalence of those who received energy assistance varied by region, less than 10% of LMI households in 8 out of 13 regions reported receiving energy bill assistance, with the Metroplex (Region 3) and the South Texas Border (Region 11) having the least number of respondents who received energy bill assistance. Moreover, there was negligible disparity between rural and urban areas, with 89% of rural respondents and 90% of urban respondents statewide reporting no receipt of energy bill assistance.

Figure 16. ***Majority of households do not receive energy bill assistance.***



Barriers to Receiving Energy Bill Assistance

Numerous factors contribute to the low participation in energy assistance programs, including lack of awareness, concerns about meeting eligibility criteria and documentation requirements, and simply not being interested.

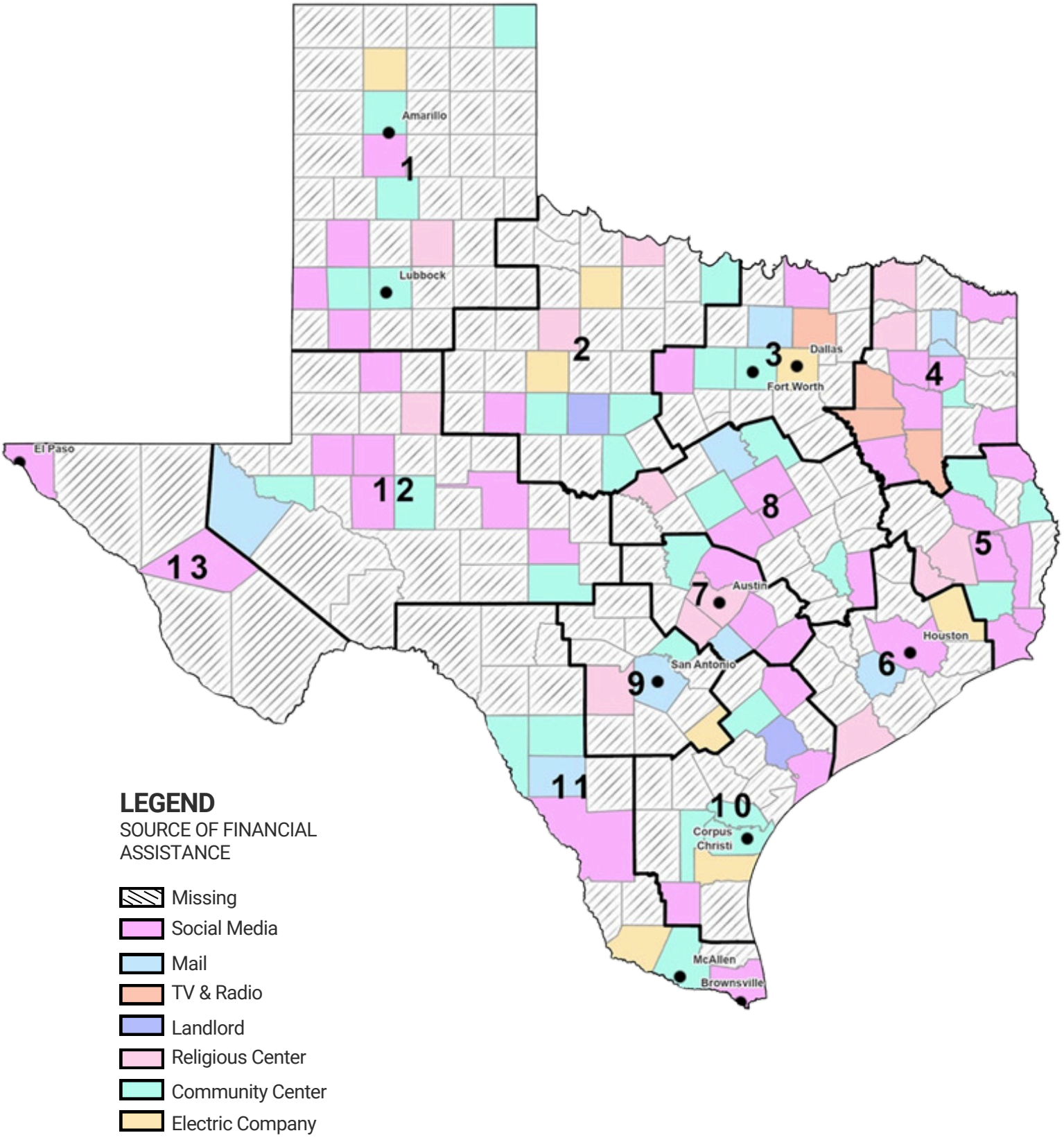
Over a third of respondents (40%) noted a lack of awareness of energy assistance programs as the reason for not receiving bill assistance. This reason was twice as common as concerns of being deemed ineligible due to program requirements such as income and citizenship.

Respondents in the lowest income brackets were more likely to express unawareness of energy assistance programs despite falling below common income qualification thresholds. **Approximately 41% of respondents in the $13,000 to $27,000 income range and 40% of those earning less than $13,000 expressed a notable lack of awareness regarding energy assistance programs.** Similarly, among respondents in the low-income category, with annual household incomes from $27,000 to $50,000, the lack of awareness was also significant, with 43% indicating they were unaware of such programs. Among the 10% of respondents who received energy bill assistance, the majority learned about these programs through community service organizations (28%) and social media channels (26%).

However, due to the limited sample size, no distinct trend regarding the effectiveness of these methods in rural and urban counties can be discerned, especially considering the survey's online platform, which may introduce a bias toward electronic communication channels.

It is noteworthy that social media emerged as the most cited information source across many regions, potentially influenced by the survey's online format which may favor electronic communication preferences, particularly among younger respondents.

Figure 17. ***Where respondents reported learning about energy assistance programs, by county. Community centers were the most common method of hearing about energy bill assistance***



Chapter 3: Energy Reliability, Resilience, and the Texas Grid

This section presents the key findings for the repercussions of weather-related blackouts and grid failures statewide and the coping strategies that households use to address reliability concerns.

Given Texas' diverse range of weather extremes, from temperature fluctuations to winter storms, tornadoes, and hurricanes, ensuring energy reliability remains a pressing issue. Winter storms, like Winter Storm Uri in 2021, serve as prime examples of threats to energy reliability.

This section delves into respondents' perspectives regarding power outages triggered by extreme weather events and their approaches to managing such disruptions.

Electricity Priorities	Definitions
Reliability	Receiving enough electricity to meet daily needs and avoid an outage
Resiliency	Electricity is reliable during storms and quickly comes back online after a major outage

Table 6. ***Definitions of reliability and resilience terms used in the survey for respondents.***

Respondents were surveyed to measure their level of concern about weather-related events, such as heatwaves, snowstorms, and flooding, which could potentially lead to power outages. The results indicate that **approximately 87% of households expressed some level of concern about weather-related events resulting in power outages, with 23% expressing extreme concern and 19% expressing moderate concern.**

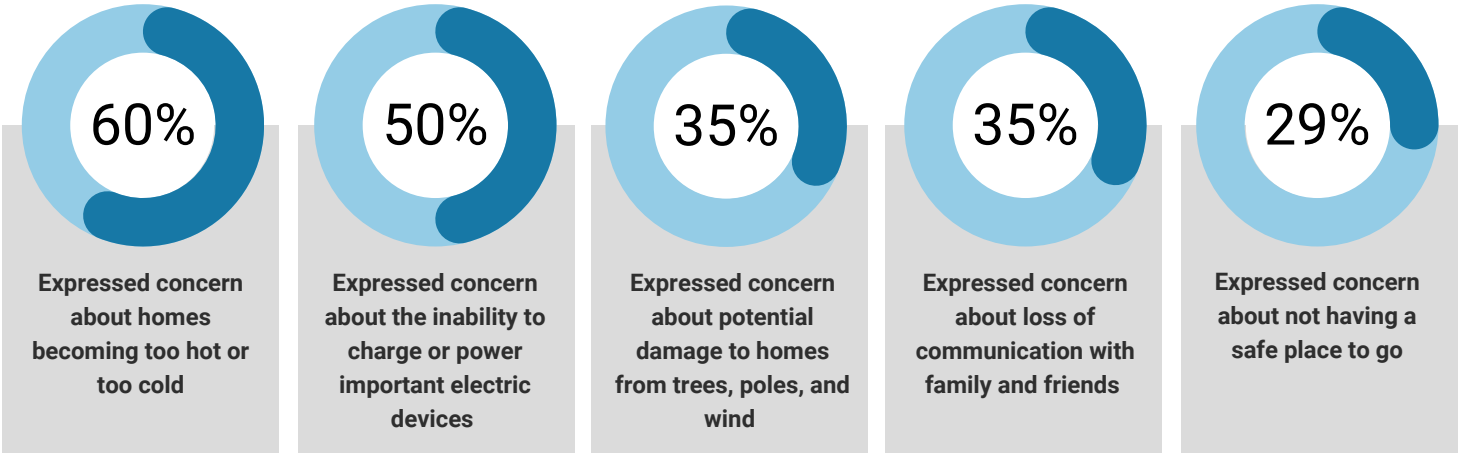
The events of the Winter Storm Uri in 2021 underscore this high degree of concern, with several areas experiencing prolonged power outages affecting a significant portion of households. For example, Cooke, Wise, Parker, and Somervell counties had over 48 hours where 20% or more of customers (in many of these counties this was over 10,000 customers) were without power [32]. Urban centers such as Houston, Fort Worth, Dallas, Austin, McAllen, and San Antonio had over 48 hours and more than 10,000 customers were without power during the winter storm [32]. Furthermore, according to reference [32] over 3,000 people with medical equipment needs were also without power at the peak of the blackout in Bexar and Tarrant counties.

Interestingly, **17% of respondents with the lowest annual household incomes (less than $13,000) – the highest percentage across all income categories — showed no concern about weather-related blackouts.** However, within this extremely low-income bracket, 29% of respondents also expressed extreme concern, surpassing any other income group (Figure 18).

Furthermore, the survey revealed a trend where **extreme concerns about weather-related blackouts decreased as income levels rose.** Low-income households, already burdened by disproportionate energy costs, are more likely to reside in unsafe structures, leaving them vulnerable to the impacts of power outages. These conditions often worsen existing wealth and health disparities.

Concerns related to wellbeing during weather-related power outages were prevalent among

respondents, **with 60% expressing concern about their homes becoming too hot or too cold during outage periods.** Other reported concerns include the inability to charge or power important electric devices (50% of respondents), potential damage to homes from trees, poles, and wind (35%), loss of communication with family and friends (35%), and not having a safe place to go (29%).



While there was no clear trend across income categories regarding the ability to maintain a comfortable home temperature and the inability to charge devices, the survey did identify that concerns about loss of communication decreased as income rose. Concerns about home damage, however, increased with income (Figure 19), likely because the higher income households may own their own homes, and therefore carry a significant burden of addressing home damages from extreme weather.

Figure 18. ***The lowest income households have the highest concerns about weather related blackouts.***

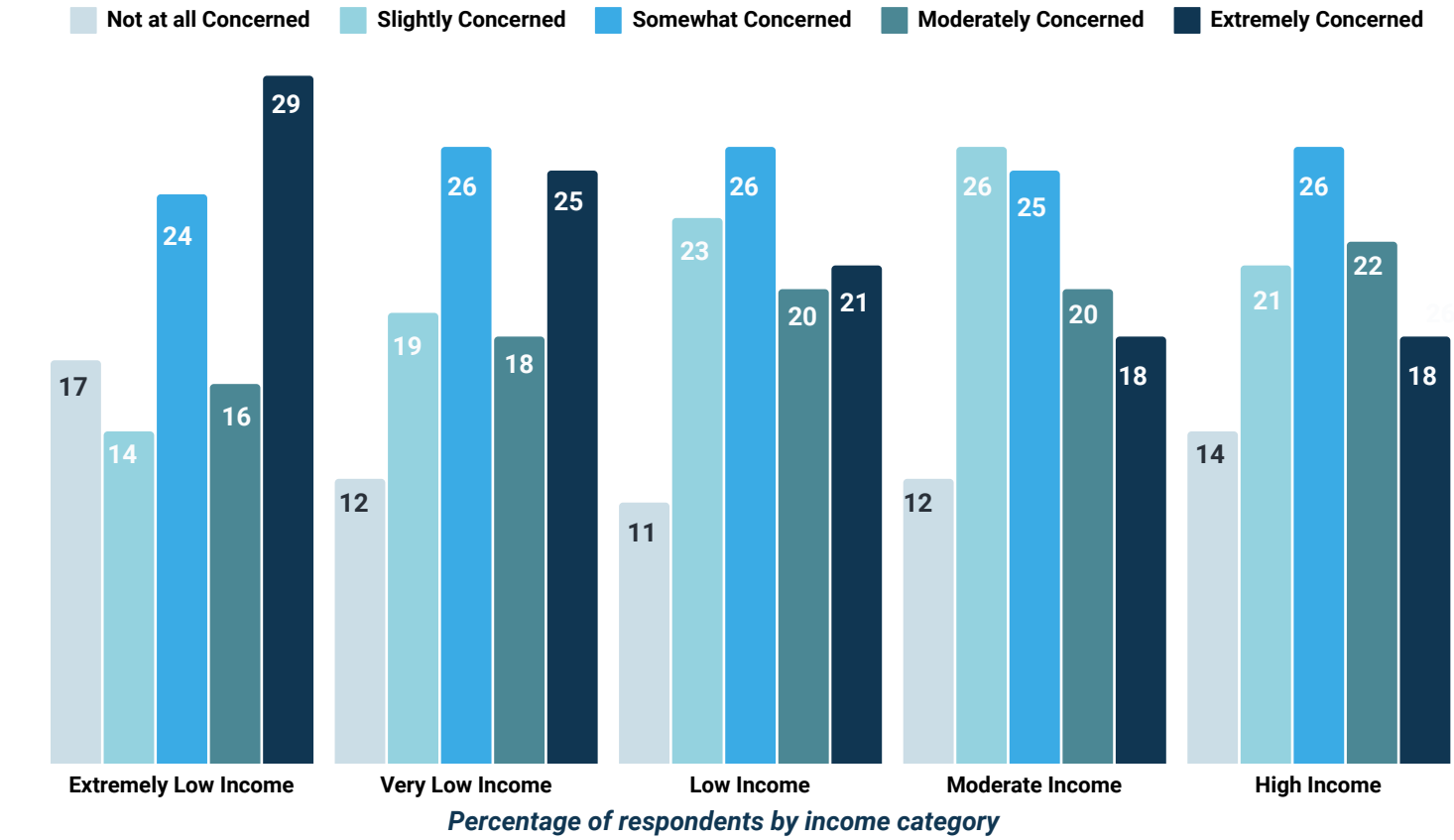
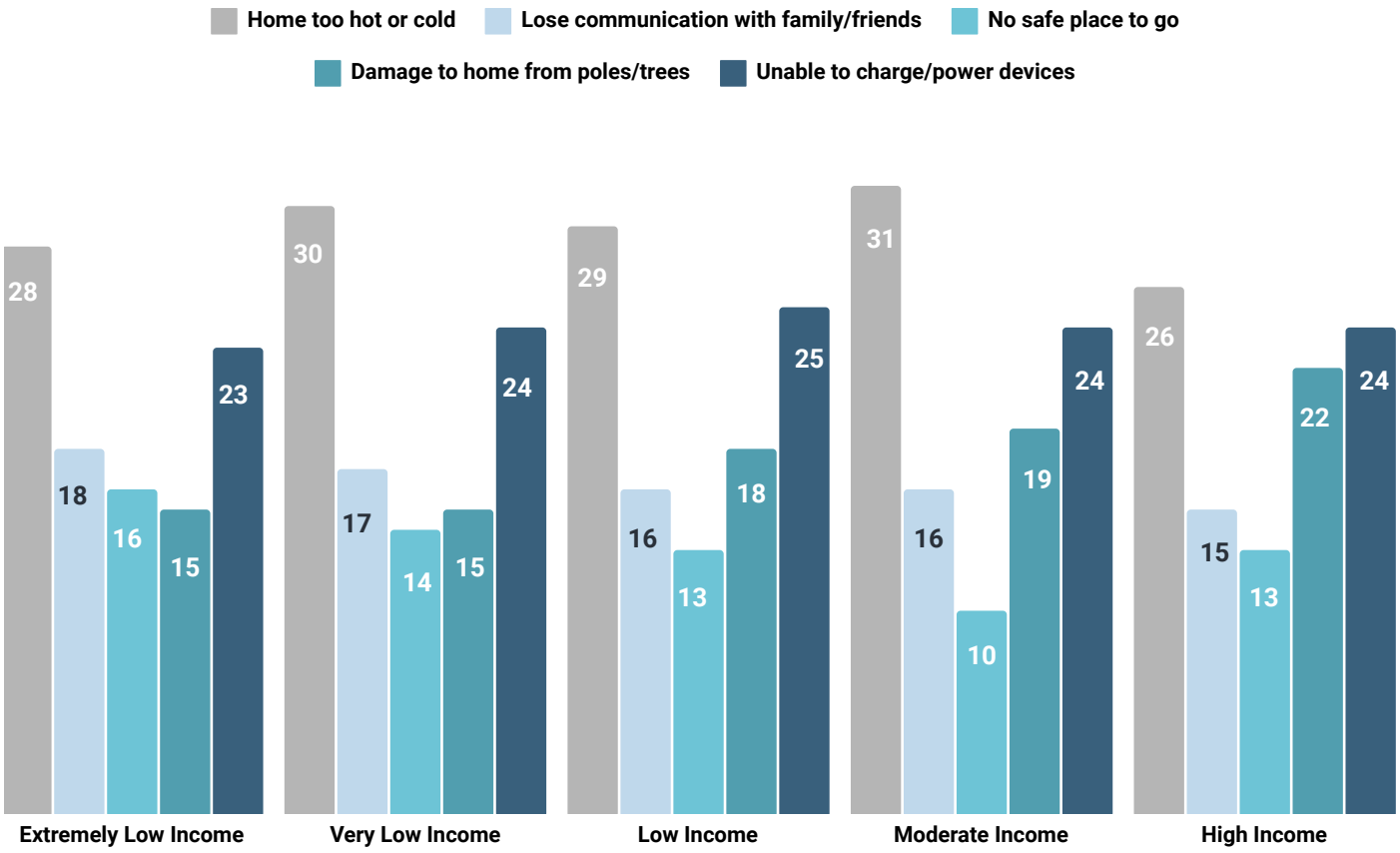


Figure 19. ***LMI households are primarily concerned about indoor thermal comfort and the ability to charge/power their devices during a weather-related blackout.***



Percentage of respondents by income category

Disparities in Energy Resiliency Concerns

Disparities in energy insecurity further exacerbate the challenges faced by low-income, rural, and vulnerable populations in Texas. The survey findings illuminated the disproportionate burden of energy insecurity in certain demographic groups and communities.

Rural vs. Urban Communities

Research shows that rural communities are more susceptible to power outages and grid failures, which can have significant impacts on daily life, economic productivity, and public health [31]. However, at a statewide level, both **rural and urban respondents show a similar level of concern about weather-related blackouts, with 87% of rural and 87% of urban respondents expressing worries about weather-related blackouts.**

This level of concern may be driven in part by experiences during Winter Storm Uri in 2021 where both rural counties like Wharton, Chambers, and Austin and urban counties like Waller, Fort Bend, Brazoria, Galveston, Harris, and Montgomery endured prolonged power outages, affecting tens of thousands of households in each county [30].

When it comes to specific concerns about weather-related outages, there were negligible differences between rural and urban respondents. For instance, 30% of rural respondents, compared to 29% of urban respondents, are concerned about indoor thermal comfort. Similarly, 17% of rural respondents and 15% of urban respondents worry about losing communication with family and friends.

Additionally, rural utility companies, operating in areas with aging infrastructure and limited resources, often struggle to restore power promptly during outages, leaving rural customers particularly vulnerable [32]. In contrast, urban areas typically benefit from more reliable energy systems and demonstrate greater resilience to disruptions due to advanced capacity.

Racial/Ethnic Disparities

Studies such as those conducted by reference [30] and reference [33] shed light on the ethnic/racial disparities in power outages during Winter Storm Uri 2021. According to reference [30], counties with higher Hispanic populations experienced more severe outages, and Black or African American households had a 1.7 times higher chance of experiencing severe outages compared to White or Caucasian respondents. Similarly, reference [33] found that areas with a high BIPOC population share were over four times more likely to suffer blackouts compared to predominantly White areas.

Moreover, a Texas-based study in 2020 interviewed 1,052 Harris County residents and revealed that non-White respondents experienced longer outage durations after Hurricane Harvey compared to White respondents [30].

However, while research indicates that people of color endure longer outages than their White counterparts, concerns about power outages in Texas appear largely consistent across racial/ethnic lines. People of color with low-to-moderate incomes exhibit more concern about weather-related blackouts compared to White (non-Hispanic) individuals. Across income categories, **88% of respondents of color expressed some level of concern, slightly higher than the 86% of White (non-Hispanic) respondents.** However, in terms of severity, a slightly higher percentage of White respondents (24%) expressed extreme concern compared to respondents of color.

This discrepancy may be attributed to the survey's timing, possibly conducted during periods without significant blackouts for respondents to directly reference.

Regarding specific concerns such as indoor thermal and communication loss, there were similarities across racial/ethnic groups, except for worries about damage to homes from trees or poles, where a slightly higher percentage of respondents of color expressed concerns compared to White respondents (36% vs. 34%).

Housing Tenure

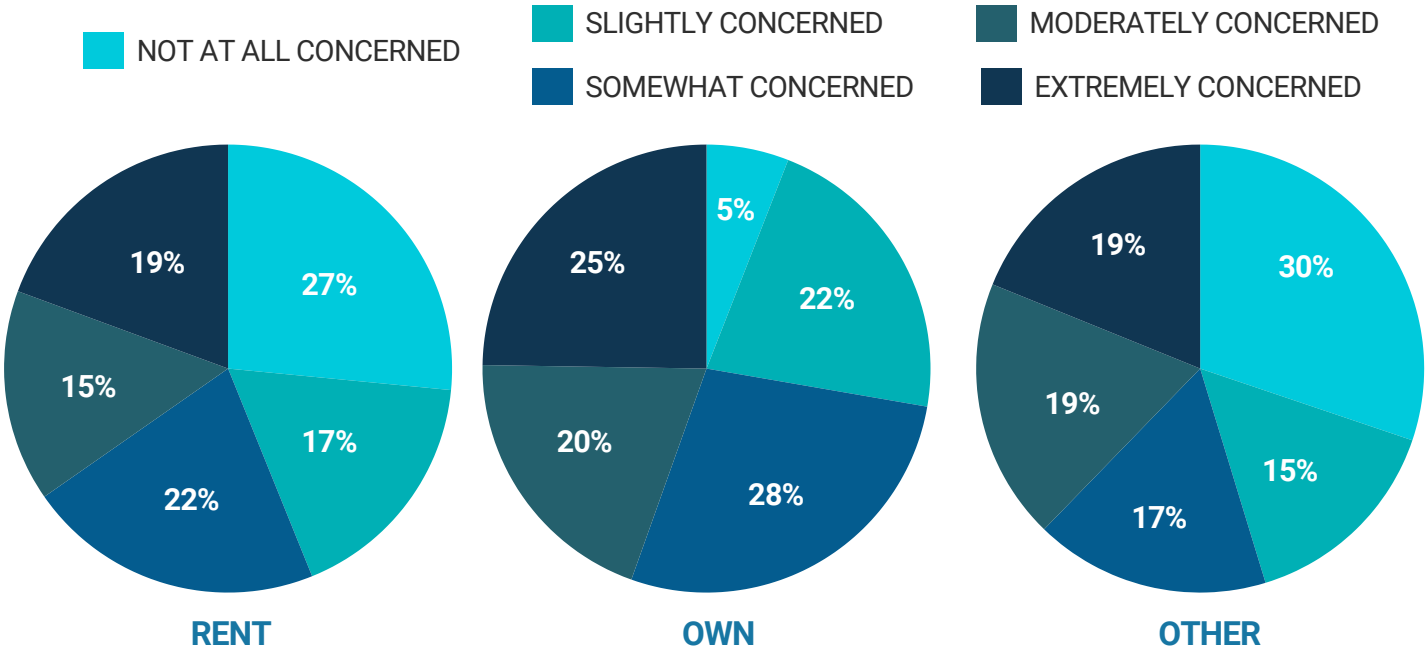
The survey findings reveal a notable discrepancy in concern about weather-related blackouts among renters, homeowners, and those in alternative housing arrangements, such as staying with friends or family. Renters exhibit a higher likelihood of expressing little to no concern about such blackouts compared to individuals in other housing tenure categories.

Specifically, **26% of renters surveyed reported no concern, contrasting with only 6% of homeowners and 16% of those in 'other' housing arrangements** such as staying with family/friends (Figure 20).

One potential reason for this disparity could be the perceived lack of control or responsibility that renters may feel regarding the maintenance and management of the property's energy infrastructure compared to homeowners who bear direct responsibility for their property's utilities. Additionally, renters may assume that addressing energy-related issues is primarily the landlord's responsibility. This perception is compounded by their transient nature and the perceived ease of relocating to another property, leading to a diminished sense of personal concern regarding potential blackouts.

Furthermore, the data indicate that renters are generally less concerned about weather-related outages compared to homeowners, although they exhibit higher levels of concern than those in 'other' housing arrangements. For instance, **15% of renters express moderate concern, and 19% express extreme concern, whereas 20% of homeowners are moderately concerned, and 25% are extremely concerned.**

Figure 20. ***Renters are less likely to be concerned about weather-related blackouts compared to households with other types of home tenure.***



Housing Types

The survey findings indicate that among various housing types such as single-family homes, multi-family residences, townhomes, and mobile/manufactured homes, households residing in mobile/manufactured homes expressed the highest level of concern regarding weather-related blackouts compared to other housing categories.

Specifically, **27% of respondents residing in mobile homes report being extremely concerned about such blackouts, surpassing the percentages of concern among those in townhomes (25%), multifamily homes (21%), and single-family homes (23%).**

Moreover, when considering the degree of concern, the data reveals that 22% of respondents living in mobile homes express moderate concern, which is higher than the percentages among those in townhomes (22%), multifamily residences (20%), and single-family homes (18%).

This trend indicates a notable level of apprehension among residents of mobile/manufactured homes regarding the potential impact of weather-related blackouts on their households.

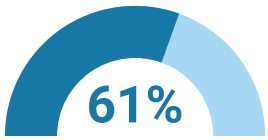
Vulnerable Groups

Interestingly, **22% of respondents residing in households with at least one member under 18 years old (minors) report no concern about weather-related blackouts. This group exhibits the highest percentage of extreme concern,** however, with **26% expressing significant worry,** compared to households with at least one member over 64 years old (the elderly) and those without vulnerable members. Specifically, 20% of households with elderly members only express extreme concern while 11% report no concern. Similarly, among households without vulnerable members, 22% are extremely concerned, contrasting with 12% showing no concern.

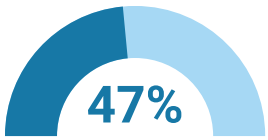
Irrespective of heating or home insulation, power outages pose risks to vulnerable individuals, highlighting a significant concern identified in the survey. Of note is the apprehension regarding the ability to charge and power essential devices and appliances, such as medical devices, oxygen concentrators, and cell phones. This concern is especially pronounced for households with elderly members who may have specific health needs or rely on powered medical equipment.

The survey findings emphasize the interconnection between reliability, resiliency, and the necessity of charging essential electronic devices, particularly for households with elderly members or individuals dependent on medical equipment and cell phones. Many respondents, especially those in households with minors, express concerns about various aspects, including home temperature regulation, communication loss, shelter availability, potential home damage from fallen trees and poles, and the inability to charge or power electronic devices.

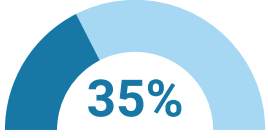
For instance, **61% of households with minors' express concerns about home temperature control, 47% are concerned about being unable to charge or power electronic devices, and 35% worry about losing communication with family and friends.** Additionally, 34% of respondents with minors are concerned about damage to their homes from trees and poles and 30% are concerned about lacking alternative shelter.



Households with minors express concerns about home temperature control

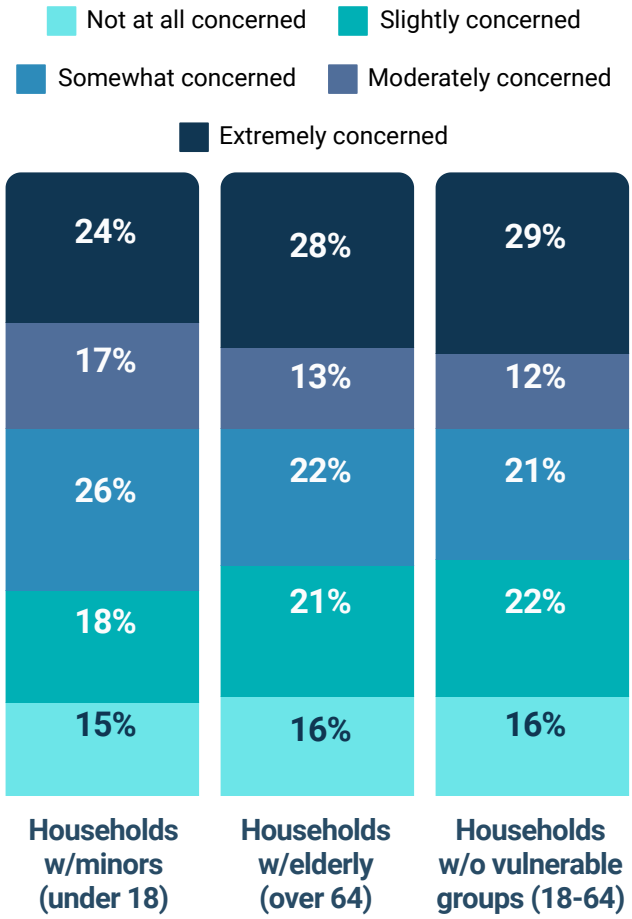


Households concerned about being unable to charge or power electronic devices



Worry about losing communication with family and friends.

Figure 21. ***The distribution of concerns of weather-related blackouts for households with minors, the elderly, and those with neither group.***



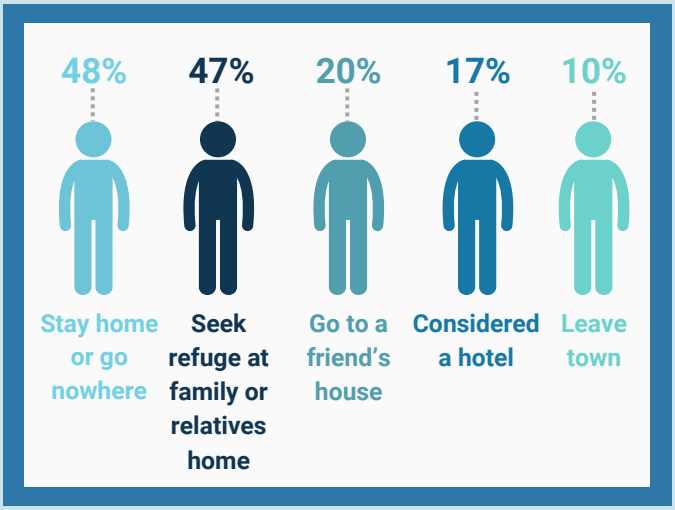
Similarly, **62% of households with seniors are concerned about maintaining a comfortable home temperature, 42% of these households express concern about home damage from fallen trees and poles, and 53% worry about the inability to charge or power electronic devices.** Additionally, 31% of households with seniors are concerned about communication loss, and 24% about shelter availability.

These concerns are not unfounded, as evidenced by a referenced study [32], which highlighted that during the peak of the power crisis during Winter Storm Uri, several thousand individuals relying on durable medical equipment were left without power, underscoring the critical implications of energy reliability for vulnerable populations.

Coping Actions During Blackouts

To better understand the experiences of families during power outages, it is crucial to examine the actions LMI Texans would take during a blackout lasting more than 24 hours. Respondents were asked, "Where would you go in the case of a power outage that lasts more than a day due to extreme weather (flooding, storms, winter storms, hurricanes, etc.)?" **A large percentage of respondents (48%) stated they would stay at home or go nowhere, while 47% would seek refuge at their family or relatives' homes.** Additionally, 20% mentioned going to a friend's house, 17% considered a hotel, 10% mentioned a shelter, and 8% said they would leave town.

Respondents were asked, "Where would you go in the case of a power outage that lasts more than a day due to extreme weather.



This distribution of responses reflects the financial constraints many households face, as traveling out of town or staying in a hotel may not be financially viable. Consequently, households may be left susceptible to severe health implications due to the inability to stay cool, and warm, charge devices, or power medical equipment.

> **...both hurricane Dolly and the freeze of 2021 the electric (sic) was out for over a week and we just stayed home with no electricity." – Survey participant on their experience during a blackout.**

The open-ended report of coping actions varied. One survey respondent stated, "I am a poor person with no one other than self (sic)" and another said, "Made it three days in house (sic) during power outage (sic) three years ago when most of Texas went dark". Another survey respondent stated "I'm scared because there's no reliable place to go. Last time we had an outage, and it was really cold several people died in our community. We just waited out try the best to survive."]

Respondents were also allowed to share additional coping actions they would take through an open-ended response, revealing a diverse range of strategies and concerns:

- Some expressed uncertainty about where to go.
- Others relied on community assistance during emergencies.
- Some mentioned staying in a different city or state.
- A few mentioned staying at home with a generator or with pets.
- Several highlighted the lack of reliable shelter options.
- Others mentioned seeking refuge at public locations or churches.
- Some expressed a willingness to drive out of state if necessary.
- Many emphasized the need for government support and intervention.

These responses offer valuable insights into the challenges faced by LMI individuals across the state during emergencies. They underscore the urgent need for governmental interventions such as resilience hubs, improved access to shelters, and the implementation of distributed energy resources in homes to enhance resilience and reliability.

Chapter 4: Clean Energy Access and Perspectives

This section of the report provides an analysis of the survey findings concerning the state of clean energy adoption across different regions. It also explores community perspectives related to clean energy, their willingness to invest in clean energy solutions, and the factors motivating their transition to cleaner energy sources.

The majority of respondents **(71%) express a desire for their electricity providers to utilize clean sources of electricity,** indicating a strong preference for renewable energy such as solar and wind power. Notably, 37% of respondents strongly agree with this sentiment, underscoring the widespread interest and demand for clean energy initiatives.

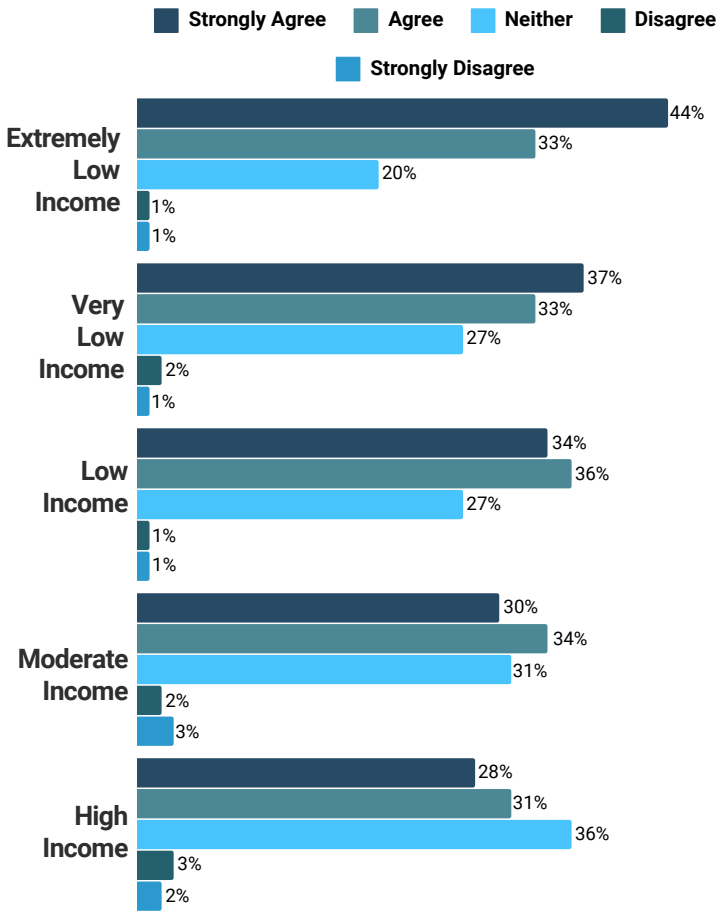
Despite the high level of interest, **only a small fraction (10%) of respondents across the state** are currently enrolled in clean energy programs offered by their electricity providers. **Almost half of the respondents, however, are willing to pay extra on their monthly energy bills to support the use of clean and renewable energy sources.** Among these respondents, the willingness to pay a monthly premium varies, **with 27% willing to pay an additional $1-5, 11% willing to pay $6-10,** and smaller percentages willing to pay higher amounts, up to more than $35 per month (Figure 23).

10%

of respondents across the state reported that they are enrolled in a clean energy program through their electricity provider.

Interestingly, respondents with lower annual household incomes demonstrate a higher inclination toward supporting clean energy initiatives. **A larger proportion of respondents with 'extremely low' incomes (44%), 37% with 'very low' income, and 34% with 'low income' strongly agree with the desire for clean energy usage,** compared to those with higher incomes (30% with 'moderate' incomes, and 28% with 'high' incomes). Despite the expressed interest in clean energy, enrollment in clean energy programs decreases with income levels, with the lowest enrollment rates observed among respondents with annual household incomes below $27,000.

Figure 22. ***Overall, majority of respondents 'agree' and 'strongly agree' that they want their electricity company to use clean sources of electricity.***



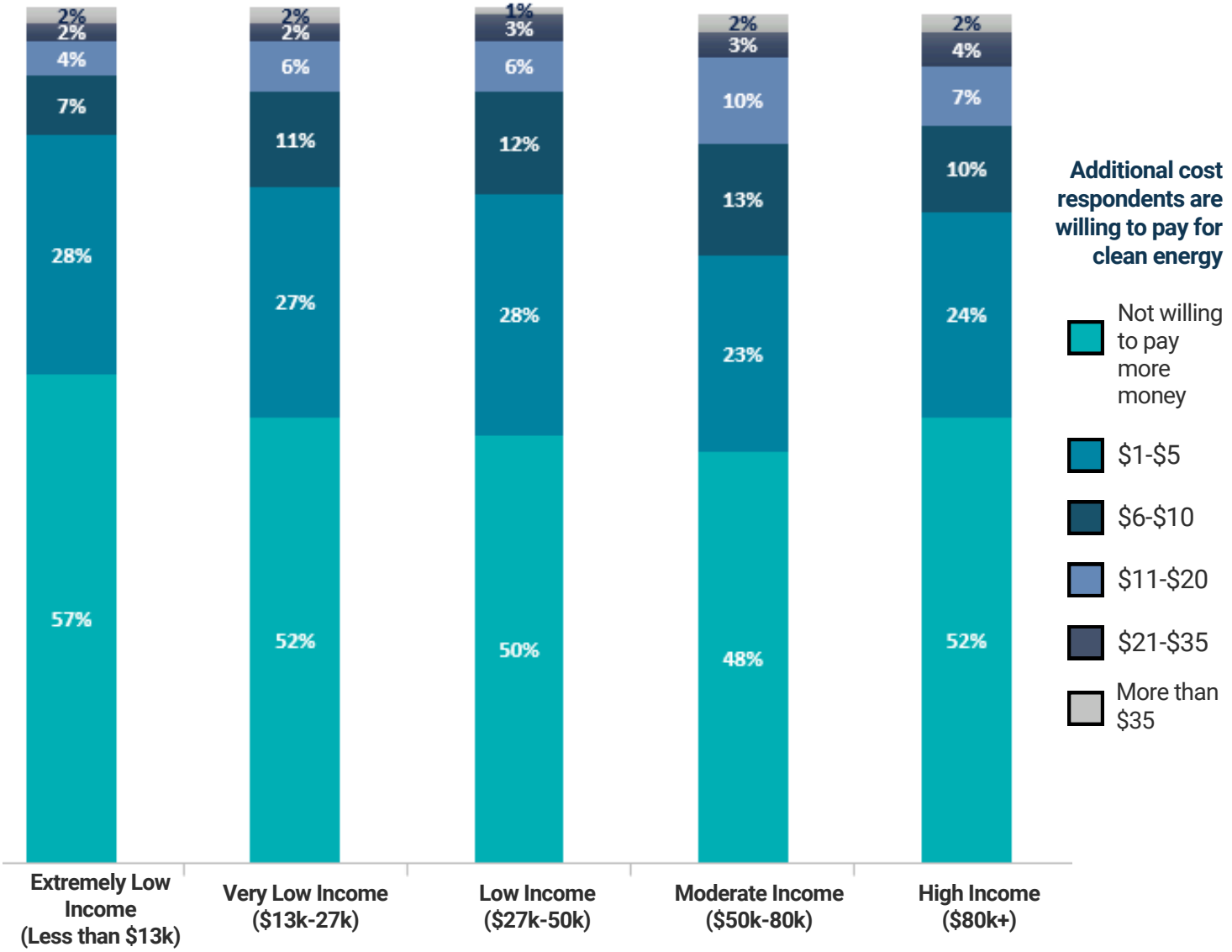
Percentage of respondents by income category

Furthermore, respondents with lower incomes are also more likely to be unaware of their enrollment status in clean energy programs. For instance, 36% of respondents with extremely low and 35% of respondents with 'very low' incomes do not know if they are enrolled. This finding suggests a need for increased awareness and outreach efforts in these communities.

Additionally, the survey revealed that 52% of moderate-income households, earning between $50,000 and $80,000 annually demonstrate the highest willingness to invest in clean energy solutions. Interestingly, even among the lowest income brackets, there is a significant willingness to contribute with 28% of respondents expressing a readiness to pay an additional $1-5 on their energy bill each month. However, respondents belonging to households with annual incomes below $13,000 exhibit the least willingness to allocate extra funds (more than $5) for clean energy initiatives on their monthly bills.

Overall, the findings highlight strong interest in a clean energy transition, the importance of addressing barriers to clean energy adoption, particularly among LMI households, and underscore the need for targeted initiatives to promote equitable access to clean energy solutions across all income levels.

Figure 23. ***Almost half of respondents are willing to pay a premium every month for clean energy.***



Disparities in Clean Energy Interest

Disparities in energy insecurity further exacerbate the challenges faced by low-income households in Texas. The survey findings underscored a disproportionate burden of energy insecurity, with certain demographic groups and communities bearing a heavier weight on the challenges.

Age Disparities

The data reveals an interesting trend regarding respondent age and attitudes toward clean energy. Younger respondents, particularly those in the age groups of 18-30 and 30-40, exhibit a stronger preference for clean energy. A substantial majority of respondents in these age brackets, 74% and 75% respectively, at least agree that they want their electricity company to utilize clean energy sources (Figure 24). Even among respondents over 50 years old, more than two-thirds still express at least some level of interest in clean energy adoption.

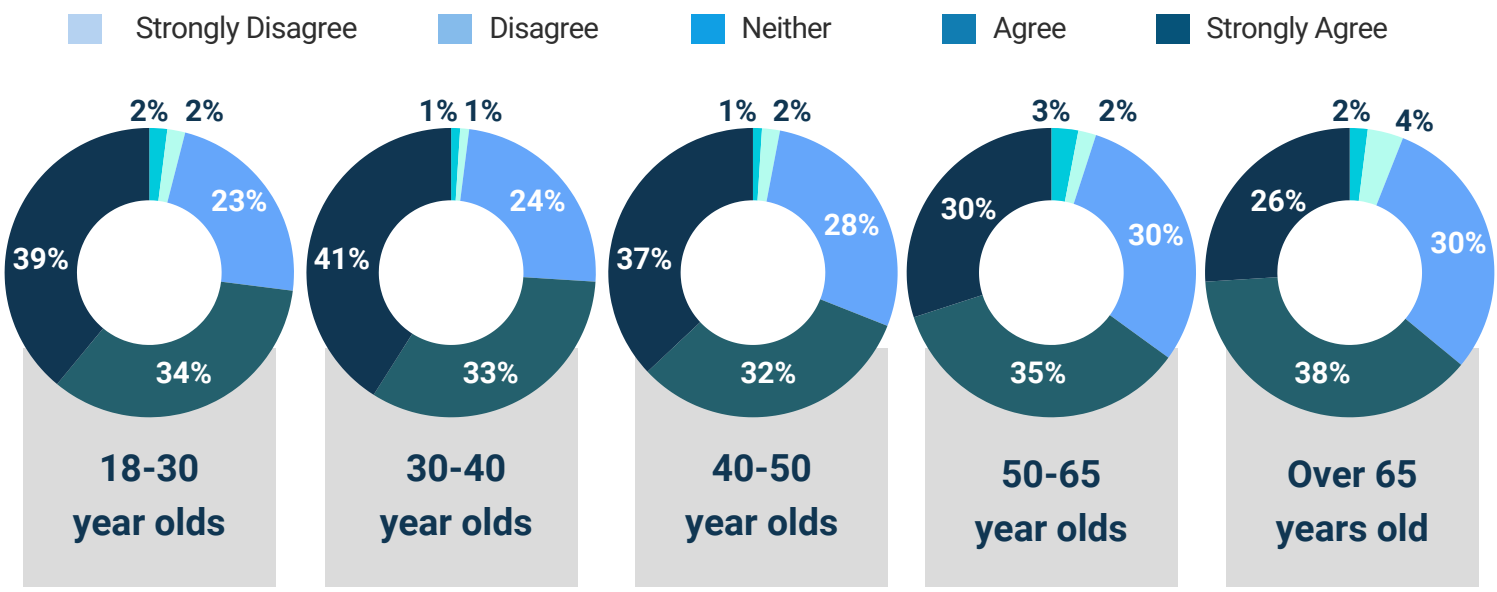
Moreover, the youngest age group (18-30 years old) stands out with the highest proportion of respondents enrolled in clean energy programs, with 13% indicating that they are enrolled.

Enrollment rates were found to decline with increasing age, with only 7% of respondents over 65 years old enrolled in such programs. Interestingly, respondents over 65 are the most likely to be uncertain about their enrollment status, with 35% reporting that they were unsure. Additionally, those aged 50-65 are less likely to be enrolled in clean energy programs, with 60% of respondents aged 50-65 indicating non-enrollment.

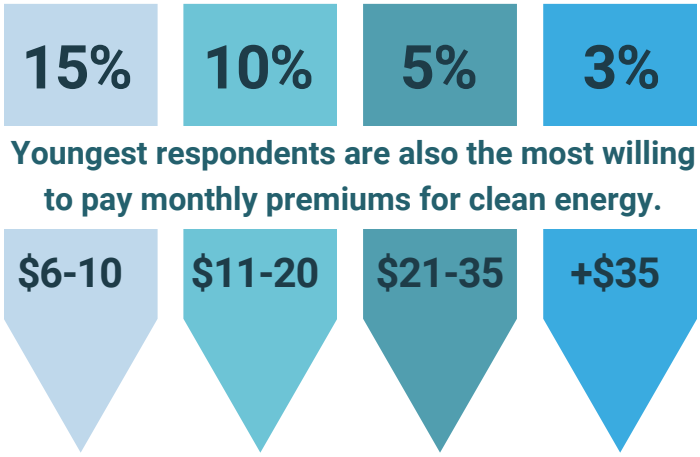
When it comes to willingness to pay for clean energy, the youngest age group again demonstrates the highest level of enthusiasm. **A majority of respondents aged 18-30 years old (59%) express a willingness to pay at least $1 more on their energy bills for clean energy.**

However, this willingness declines with age, with 60% of those over 65 stating they would not be willing to pay for clean energy compared to 41% of respondents aged 18–30 years old who are not willing to pay for clean energy.

Figure 24. ***Younger respondents have a strong preference for clean energy, 74% of those aged 18-30 and 75% of those aged 30-40, at least agree that they want their electricity company to utilize clean energy sources.***



Notably, the youngest respondents are also the most willing to pay monthly premiums for clean energy, with 15% willing to pay between $6-10, 10% willing to pay between $11-20, 5% willing to pay $21-35, and 3% willing to pay more than $35 extra per month for clean energy. In contrast, those aged 50-60 are most willing to pay between $1 and $5 more on their monthly energy bill, with 29% indicating such willingness, surpassing other age groups in this regard.



Housing Tenure

Renters may express less interest in clean energy due to their inability to reap the long-term financial benefits and wealth-building opportunities associated with owning clean energy assets such as rooftop solar. While renters may express interest in clean energy, they cannot directly reap the long-term advantages that homeowners can. Nevertheless, they do have avenues to benefit from clean energy, such as through clean energy plans.

Surprisingly, the survey results indicate that renters are more inclined than homeowners to advocate for the use of clean energy by their electricity providers. **A significant majority, 74% of renters, express a desire for their electricity company to utilize clean energy sources, compared to 66% of homeowners.**

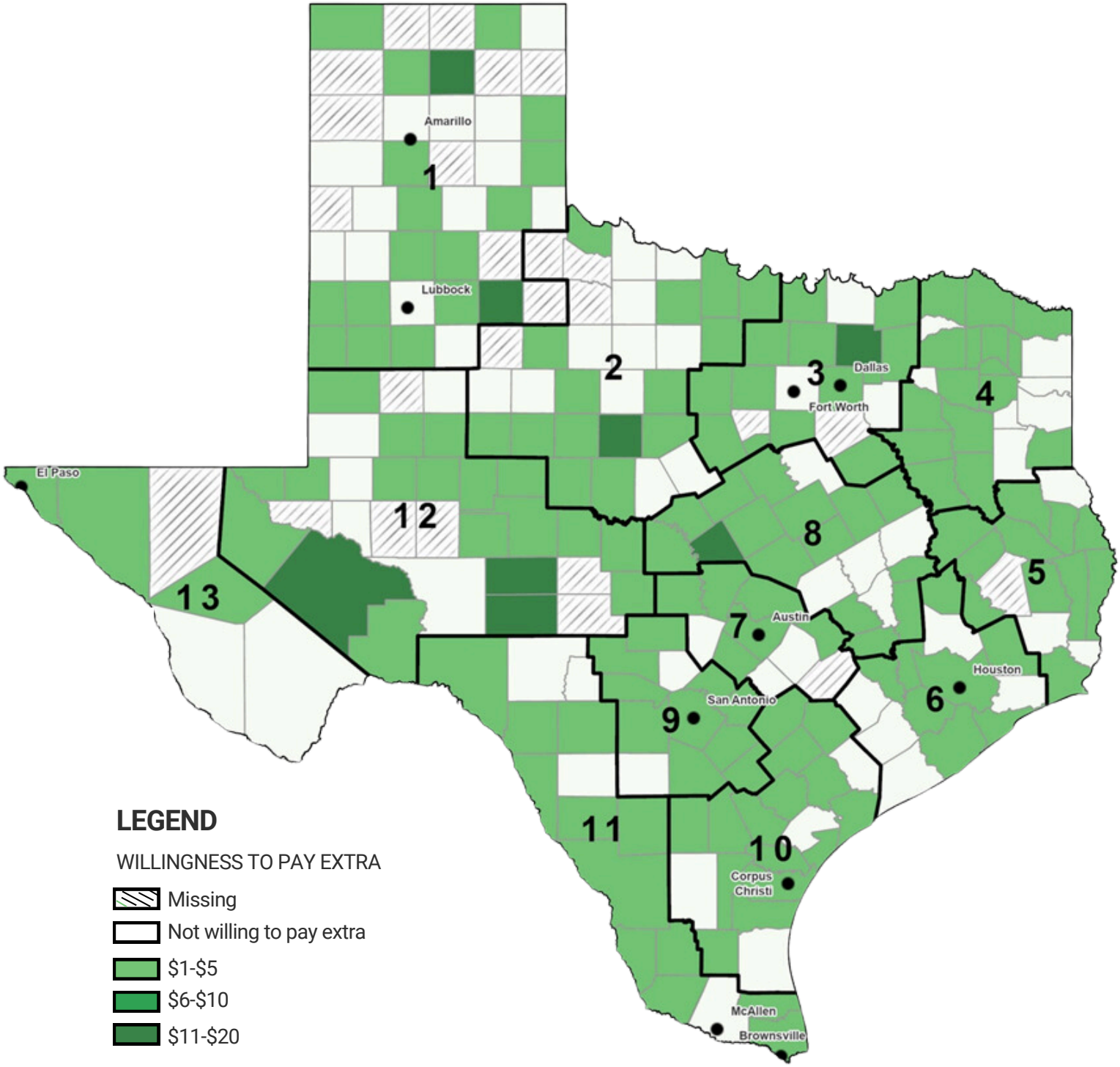
Despite this enthusiasm, renters are less likely to be enrolled in clean energy programs compared to homeowners, although overall enrollment remains low across both groups.

Specifically, only 10% of renters are enrolled in a clean energy option through their electricity provider, slightly lower than the 12% of homeowners. Moreover, a higher percentage of renters (34%) are uncertain about their enrollment status in clean energy programs, compared to 29% of homeowners. These results underscore the need for utilities, retail electricity providers, and other stakeholders to enhance customer engagement efforts, especially among renters who may not be fully aware of the clean energy options available to them.

Additionally, the survey reveals that renters are more willing to pay additional costs for clean energy compared to homeowners or individuals with other housing arrangements, such as staying with family or friends. Half of the respondents who rent express a willingness to pay more on their monthly energy bill for clean energy, a higher percentage than homeowners (46%) and those with 'other' housing tenure (42%).

Moreover, **a larger proportion of renters (29%) are willing to pay between $1 and $5 extra each month for clean energy, compared to 23% of homeowners and 25% of respondents with 'other' housing tenure.** Additionally, 11% of both renters and homeowners are willing to pay $6 to $10 more monthly for clean energy. Although homeowners exceed renters in willingness to pay higher premiums, renters still show significant interest, with 2% expressing readiness to pay over $35 extra per month for clean energy on their energy bills.

Figure 25. ***Geographic distribution of respondents willingness to pay, by county. On average, respondents are willing to pay between $1-5 extra on their monthly energy bills for clean energy, with more rural counties having a larger average of respondents willing to pay $6-10 more on their monthly energy bills.***



Chapter 5 : Gaps, Opportunities and Recommendations

The issue of energy insecurity in Texas is complex, impacting people's lives in a myriad of ways. To effectively address these issues, targeted interventions and policies are needed to tackle the root causes of energy insecurity and promote energy equity statewide.

Respondents were asked to rank four key electricity-related issues: affordability, sustainability, reliability, and resiliency. The results revealed that **affordability was the foremost priority, with half of the participants choosing "Most Important". Additionally, nearly 30% of respondents recognized affordability as "Somewhat Important".**

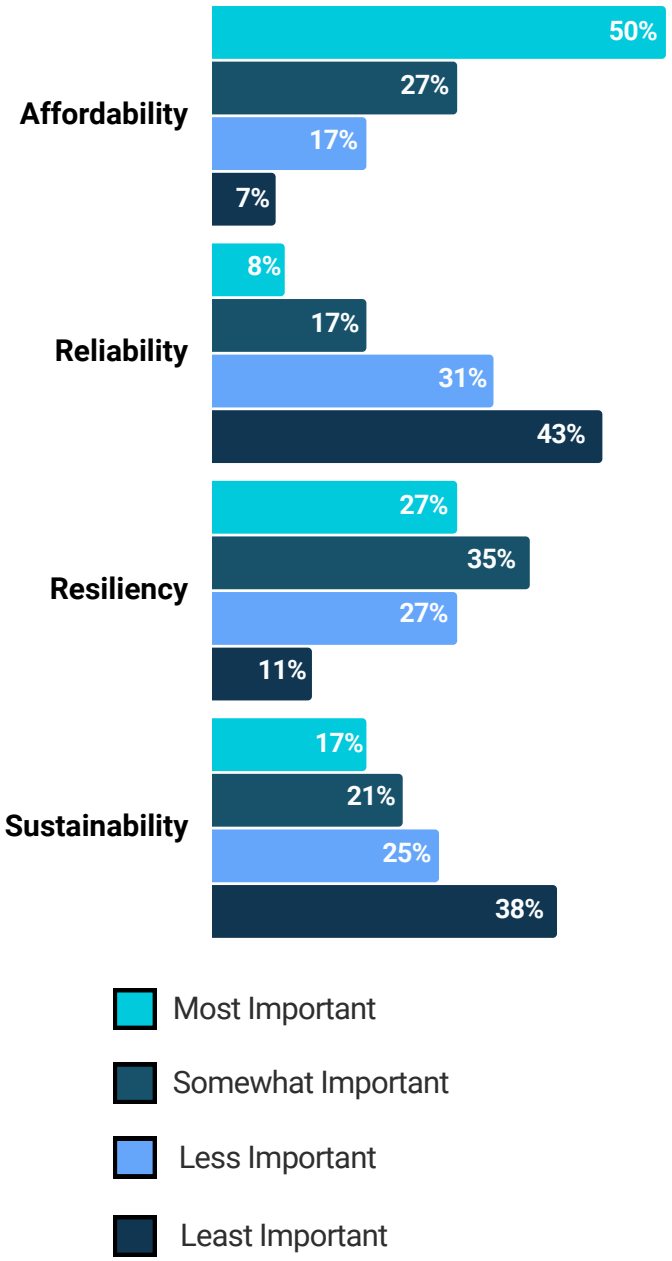
Table 7. ***Definitions of electricity terms for respondents ranking by importance.***

Electricity Priorities	Definitions
Affordability	Electricity should be affordable to everyone.
Sustainability	Electricity should be clean and environmentally friendly.
Reliability	Receiving enough electricity to meet daily needs and avoid an outage
Resiliency	Electricity is reliable during storms and quickly comes back online after a major outage.

Closely following affordability, the second most prioritized concern was resiliency, especially during adverse weather. Almost 30% of respondents ranked it as most important and 35% as somewhat important.

These findings underscore the essential need to simultaneously address both affordability and resiliency to ensure equitable energy access. While sustainability and reliability are not top priorities for LMI households, they are important for a robust and equitable energy system in Texas.

Figure 26. ***Affordability and resiliency are LMI households top two energy priorities***



Enhancing Access to Energy Assistance Programs

Survey findings indicate significant challenges regarding energy bill affordability among respondents statewide. Roughly 40% find their energy bills unaffordable, with about 50% perceiving them as manageable. Moreover, 24% strongly agree and 25% agree they struggle to meet energy expenses most months.

Forty percent (40%) cited a lack of awareness of energy assistance programs as the reason for not receiving assistance, overshadowing concerns about eligibility due to income, citizenship, or housing conditions, particularly relevant for renters. These findings stress the need for improved community outreach and education regarding energy assistance programs.

In Fiscal Year (FY) 2022, Texas received $180,168,931 for energy assistance through the US Department of Health and Human Services LIHEAP program, benefiting 171,600 households (Table 8) [34]. Of this allocation, $168,312,136 was designated for direct assistance.

However, only less than 3% of income-eligible households received heating assistance in FY 2022, and approximately 2% received cooling assistance. This echoes similar patterns from previous fiscal years, where only 3-5% of income-eligible households were served, suggesting a persistent shortfall in funding to meet the energy assistance needs of income-eligible households in Texas. Additionally, minimal funds were carried over, except for FY 2020, where $8,483,494 was carried over, indicating a lack of surplus resources to address fluctuations in demand.

However, there are signs of potential utilization and distribution concerns. In FY 2021, Texas received nearly double the usual annual funding for home energy assistance, with an additional $134.4 million from the American Rescue Plan.

Despite this boost, LIHEAP performance data indicates that only about 2.5% and 3% of income-eligible households received heating and cooling assistance, respectively, which was lower than the previous year. This discrepancy prompts questions about the equitable distribution and effective utilization of funds, especially given the consistent number of income-eligible households in that fiscal year and the substantial increase in energy assistance funding.

The survey shows that for LMI households across the state, 40% of respondents are interested in learning more about programs to help households with electricity bill assistance or weatherization resources. This shows there are opportunities for targeted outreach across both areas and an opportunity to engage people on energy assistance and clean energy.

To enhance energy assistance programs, the following program changes can be implemented.

- **Targeted Outreach Campaigns:** Develop comprehensive outreach campaigns tailored to reach LMI households. Utilize community-based organizations, social media platforms, and direct communication channels to raise awareness about energy assistance programs.

- **Streamlined Application Processes:** Simplify the application process for energy assistance programs to reduce barriers to entry. Implement user-friendly online application options and provide multilingual support to accommodate diverse populations.

- **Partnerships with Landlords:** Establish collaborative partnerships with landlords to facilitate access to energy assistance programs for renters. Ensure that all eligible households, including those in rental properties, can benefit from financial assistance to alleviate energy burdens.

- Advocate for Additional Resources: Energy assistance funding through LIHEAP is fully spent each year with waiting lists. There is a crucial and growing need for additional funding to be allocated to the state LIHEAP.

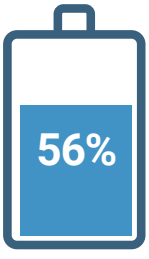
Table 8. ***Distribution of LIHEAP funds in Texas over fiscal years 2019–2022. The table also highlights the percentage of income-eligible households served by LIHEAP in Texas.***

Fiscal Year	Total Program Funding	Total Funds for Assistance	Funds Used for Carryover	State Income Eligible Households	% of Income-Eligible Households Served by Heating Assistance	% of Income-Eligible Households Served by Cooling Assistance
2019	$161,043,673	$148,171,874	$39,995	2,109,662	3%	5%
2020	$257,137,420	$234,050,739	$8,484,494	2,092,327	4%	3%
2021	$307,462,084	$280,848,792	$0	2,097,264	3%	3%
2022	$180,168,931	$168,312,136	$7,500	2,715,064	3%	2%

Source: LIHEAP Performance Measurement Web Site

Addressing Reliability and Resilience Concerns

When asked about actions from local government to reduce concerns about power outages during bad weather, **the majority of respondents (56%) cited providing a backup energy source like battery storage would help.** Other measures include timely communication about potential outages, providing resource lists, offering safe places with electricity and essentials, and emergency phone numbers.



Respondents cited providing a backup energy source like battery storage would help

Texans show a heightened awareness of their role in the energy system, indicating the potential for tailored conservation and demand response strategies to encourage greater participation andenergy consumption reduction.

To understand household responses to market practices like voluntary electricity reduction, respondents were asked about incentives needed for conserving electricity. **More than half (53%) are willing to reduce energy use for financial compensation, while a third (33%) are willing to do so voluntarily. Few (14%) are not willing to reduce energy use in an emergency.**

These findings provide valuable data for advocacy efforts raising awareness about energy affordability issues and advocating for policy changes prioritizing low-income household needs, supporting evidence-based policy recommendations promoting energy equity and affordability for all residents.

To address reliability concerns and capitalize on demand response interests, the following changes can be implemented.

- **Infrastructure Investments:** Allocate funding for infrastructure upgrades aimed at enhancing the resilience of the energy grid. Prioritize investments in microgrids, smart technologies, and distributed energy resources to improve grid reliability and mitigate the impacts of extreme weather events.

- **Community Resilience Hubs:** Establish a network of small and mid-size community resilience hubs equipped with backup power sources, emergency supplies, and communication systems. These hubs will serve as safe havens during power outages and other emergencies, providing essential support to vulnerable populations.

- **Public Awareness Campaigns:** Launch robust public awareness campaigns to educate households about emergency preparedness measures and available resources during power outages. Provide information about designated shelters, cooling/warming centers, and emergency contact numbers to empower communities to effectively respond to energy-related emergencies.

Promoting Clean Energy Adoption

Clean energy and energy efficiency pathways, including distributed energy resources (DERs) facilitated through bulk purchasing can provide direct access to clean energy generation, and reduce energy costs for LMI households. Clean DERs encompass a wide spectrum of technologies including 'generating' resources such as rooftop solar and community solar, and 'energy reduction' resources such as energy efficiency, demand response, and energy storage.

Per the Environmental Defense Fund, expanding deployment of generating and energy reduction types of clean DERs in the competitive market "will ensure the continued transition of the Texas electric grid to clean energy, curb climate and local air pollution, and provide additional resources that can support the integration of utility-scale wind and solar projects into the ERCOT wholesale market. [35]"

Unfortunately, there are tremendous barriers to low-income households participating in DERs. Despite the significant number of households with high energy burdens in Texas, there is limited comprehensive guidance for LMI households on available options for energy efficiency and clean DERs. There is also limited guidance on how to access available energy efficiency programs, which TEPRI's research indicates is due to low customer education and awareness of energy efficiency programs.

Moreover, financial resources to support the implementation of energy efficiency and clean energy solutions are left untapped by LMI households. Additionally, the availability of program funds fluctuates, creating uncertainty regarding their reliability from year to year. This inconsistency poses challenges for individuals who depend on these funds, as the allocation may vary and does not meet the demand adequately.

To address clean energy barriers, the following changes can be implemented.

- **Education and Outreach Programs:** Develop educational resources and outreach programs to inform LMI households about the benefits of clean energy technologies. Provide information about available incentives and financing options for rooftop solar installations, community solar programs, and energy efficiency measures.

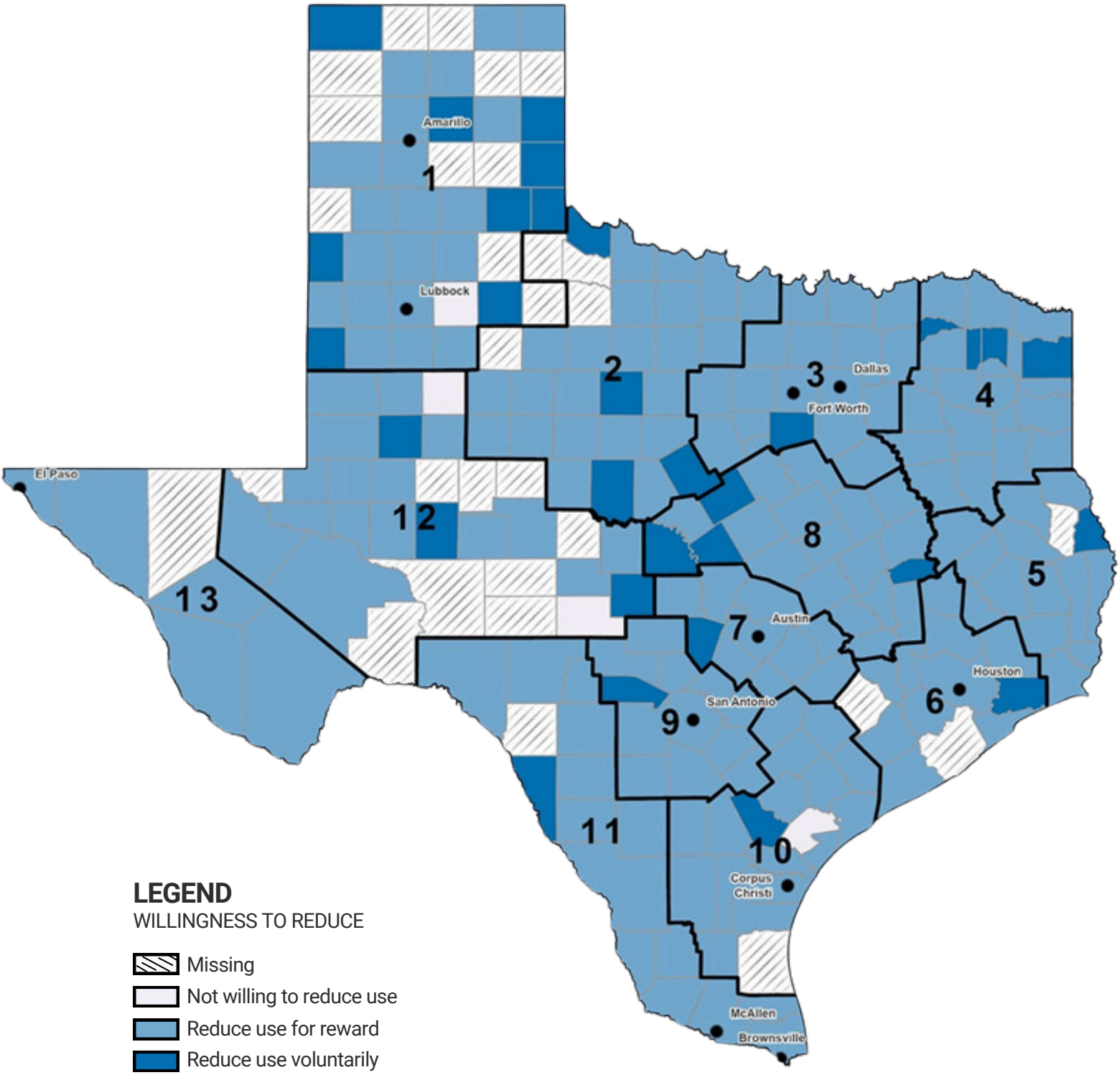
- **Financial Incentives:** Offer financial incentives and subsidies to offset the upfront costs of clean energy investments for LMI households. Implement grants, rebates, and low-interest financing options to make clean energy solutions more accessible and affordable.

- **Community-Based Initiatives:** Support community-led clean energy projects and partnerships aimed at increasing access to clean energy solutions. Encourage the establishment of energy cooperatives and neighborhood solar programs to empower communities and build local resilience.

By implementing these policy and program recommendations, Texas can address the systemic challenges faced by LMI households in accessing affordable, reliable, and clean energy. While challenges persist, there are opportunities for progress by prioritizing affordability, resilience, and clean energy initiatives. Texas can lead the nation in building a more equitable and sustainable energy future through policies that expand access to energy assistance programs, enhance energy efficiency standards, invest in affordable housing, and support community-led solutions.

This holistic approach will contribute to building a more equitable and sustainable energy future for all residents, ensuring that no one is left behind in the transition to a cleaner and more resilient energy system.

Figure 27. ***Geographic distribution of respondents' willingness to reduce energy use to prevent a blackout, by county.***



Chapter 6: Conclusion — Forging an Equitable Energy Future

The findings presented in this report underscore the urgent need for comprehensive and equitable solutions to address energy inequity and enhance resilience in Texas. Across the state, households, particularly those with low-to-moderate incomes, face significant challenges related to energy affordability, reliability, and resilience. These challenges are compounded by weather-related events, and systemic disparities, highlighting the critical importance of targeted interventions and policy reforms to ensure equitable access to affordable, reliable, and clean energy for all Texans.

Understanding the Landscape of Energy Inequity

Key statewide findings reveal the multifaceted nature of energy insecurity in Texas. Affordability emerges as a primary concern, with approximately 40% of respondents finding their energy bills unaffordable, despite efforts to manage expenses. Moreover, a quarter of respondents strongly agree that they struggle to meet energy expenses most months. This underscores the pressing need to address energy affordability barriers, particularly for LMI households who are disproportionately affected.

Resiliency is another paramount concern, especially during adverse weather conditions. Nearly 30% of respondents prioritize resiliency as the most important electricity-related issue, emphasizing the critical need for a resilient energy infrastructure capable of withstanding extreme weather events. Enhancing grid reliability and resilience is essential to mitigating the impacts of power outages on households, businesses, and public health, particularly in vulnerable communities.

Identifying Disparities and Barriers to Access

The survey findings highlight disparities in energy insecurity, with certain demographic groups and communities facing disproportionate burdens. For instance, renters are more inclined to report their energy bills as unaffordable and face challenges in paying them consistently.

LMI households in mobile homes are more concerned about weather-related blackouts compared to households in other housing types such as multifamily and single-family homes. Additionally, housing tenure plays a significant role, with renters expressing less interest in clean energy adoption due to barriers to reaping long-term benefits.

Recommendations for Equitable Solutions

To address these challenges and promote energy equity in Texas, targeted interventions and policy reforms are imperative. Enhanced access to energy assistance programs is essential to alleviate energy burdens for LMI households. Streamlining application processes, implementing targeted outreach campaigns, bolstering resources, and establishing partnerships with landlords can facilitate greater access to financial assistance and weatherization resources.

Investments in grid infrastructure upgrades and the establishment of community resilience hubs are critical to enhancing grid reliability and resilience. Public awareness campaigns and demand response strategies can empower households to reduce energy consumption and participate in grid management efforts.

Furthermore, expanding access to clean energy solutions through education, outreach, and financial incentives can facilitate a transition to a more sustainable energy future.

Building a Resilient and Sustainable Energy Future

In conclusion, addressing energy inequity in Texas requires a holistic approach that prioritizes affordability, reliability, and sustainability. By implementing targeted policies and programs, Texas can lead the nation in building a more equitable and sustainable energy future. Through collaborative efforts between government agencies, utilities, community organizations, and stakeholders, we can ensure that no one is left behind in the transition to a cleaner, more resilient energy system. Together, we can shape a brighter and more sustainable future for all Texans.

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Supplemental: Methodology and Research Study

This section provides an in-depth overview of the methodology employed for the Community Voices in Energy Survey (CVES) conducted by the Texas Energy Poverty Research Institute (TEPRI) between December 2022 and March 2023. The CVES sought to comprehensively understand the landscape of energy insecurity in Texas, with a specific focus on households with low-to-moderate incomes (LMI) across the state's 13 Uniform State Service Regions as delineated by the Texas Department of Housing and Community Affairs (TDHCA). The methodology encompasses data collection methods, sample selection, and data analysis techniques utilized.

Research Objective

The primary objective of the CVES was to develop a comprehensive profile of LMI communities across Texas and gain insights into their intricate relationship with energy. The secondary objectives of the study included.

1. Delineating energy challenges and needs.
2. Identifying disproportionate experiences of LMI households as it relates to energy burden and energy insecurity.
3. Aiding stakeholders (such as utilities and community-based organizations) in making better and informed decisions of need-based solutions to improve the energy needs of Texans.
4. Maintaining an updated database on community needs for effective energy deployment.

Survey Design

The CVES employed a meticulously designed semi-structured approach, incorporating a blend of open-ended and closed survey questions. Crafted with accessibility in mind, the survey questions were tailored to an 8th-grade reading level to ensure comprehension for all participants. Before deployment, the survey underwent extensive internal and external reviews to validate its effectiveness in meeting the research objectives, ensuring ease of comprehension, and maintaining relevance. Consisting of 33 questions in total, the survey was strategically segmented into five parts, each targeting specific facets of the research objectives:

- **Part 1:** Demographics, encompassing household size, employment status, and household income.
- **Part 2**: Energy Affordability, aimed at quantifying the impact on LMI households grappling with disproportionate energy expenses.
- **Part 3:** Energy Reliability, focused on identifying concerns regarding weather-related blackouts and the necessity for a more resilient grid.
- **Part 4:** Sustainable and Clean Energy Perspectives, exploring interest in clean and sustainable energy alternatives and willingness to invest in cleaner energy sources.
- **Part 5:** Additional inquiries, including respondents' ratings of energy priorities and their interest in learning about programs offering electricity bill assistance or weatherization resources.

Study Population and Sample Size Determination

To ensure a comprehensive representation, Texas was segmented into thirteen distinct regions aligned with the Texas Department of Community Affairs energy districts (see Figure 1). The sample size for each region was meticulously calculated using a combination of data sources, employing stringent inclusion criteria to guarantee a 99% confidence level and a 5% confidence interval. To ensure a comprehensive representation, Texas was segmented into thirteen distinct regions aligned with the Texas Department of Community Affairs energy districts (see Figure 1).

The sample size for each region was meticulously calculated using a combination of data sources, employing stringent inclusion criteria to guarantee a 99% confidence level and a 5% confidence interval. This approach facilitated the selection of counties within each region, enabling us to derive insights into the energy affordability, reliability, and clean energy requirements of low-income adults across Texas. The inclusion criteria for respondents were as follows:

1. Household incomes falling below the designated income ceiling per region, as outlined in Table 1.
2. Individuals aged 18 years or older.
3. Representation across all thirteen TDHCA regions in Texas, as depicted in Table 1.
4. Inclusion of household members responsible for energy management decisions.
5. Inclusion of both rural and urban households, with sampling quotas tailored to maintain proportional representation, as delineated in Table 1.

TDHCA Region	Region Designation	Total LMI Population	LMI Sample Size (99/5)	LMI Rural Sample Size Designation	LMI Urban Sample Size Portion	Income Ceiling Per Region
1	High Plains	122,107	660	34%	66%	$42,544
2	Northwest Texas	83,365	658	49%	51%	$41,399
3	Metroplex	1,158,245	663	3%	97%	$59,078
4	Upper East Texas	166,580	661	57%	43%	$42,701
5	Southeast Texas	115,994	658	49%	50%	$40,141
6	Gulf Coast	848,712	663	4%	96%	$56,606
7	Capital	386,946	662	5%	95%	$61,597
8	Central Texas	694,245	633	78%	22%	$43,737
9	San Antonio	496,217	663	9%	91%	$56,729
10	Coastal Bend	163,461	661	50%	50%	$42,644
11	South Texas Border	394,081	662	12%	88%	$33,754
12	West Texas	165,354	661	26%	75%	$47,199
13	Upper Rio Grande	119,367	660	3%	97%	$31,415

Study Population and Sample Size Determination

The data collection phase spanned four months, commencing in December 2022 and concluding in March 2023. To ensure a robust representation of LMI households across the state, a dual approach to data collection was adopted, enlisting two survey companies (Survey Company A and Survey Company B). Both companies utilized mobile and digital platforms for data collection.

Survey Company A was tasked with gathering responses from individuals meeting income thresholds approximating 80% to 100% of the Area Median Income (AMI). TEPRI conducted additional calculations to determine the average AMI by aggregating and dividing individual county AMI figures within each region by the total number of counties in that region.

In contrast, Survey Company B targeted respondents meeting inclusion criteria, with a specific focus on Supplemental Nutrition Assistance Program (SNAP) recipients to ensure representation from the lowest income bracket. To incentivize participation, respondents from this group were offered compensation of approximately $4 added to their SNAP benefits.

Prior to administering the survey, participants were fully briefed on the study's objectives, protocol, and data handling procedures, including provisions for data breaches and the collection of personal identifiers. Explicit consent was obtained from all participants before the surveys were administered.

Survey Analysis

The analysis of survey responses involved a multi-faceted approach, encompassing descriptive statistics, cross tabs, geospatial analysis, and regression analysis. From a total of 7,970 responses received, 6,520 were deemed suitable for further analysis. Responses were evaluated regionally, aligning with TDHCA's 13 uniform service regions, to ensure comprehensive insights into the energy challenges faced by LMI households across Texas.

Furthermore, the analysis specifically focused on households responsible for paying their electricity bills directly to their utility/electricity service provider, or indirectly through their landlords. Respondents who neither paid their electricity bill nor had someone in their household responsible for payment were excluded from the final analyses.

Conclusion

In conclusion, the robust methodology employed in the CVES ensures the reliability, validity, and comprehensiveness of the survey findings, providing invaluable insights into the energy challenges faced by LMI households across Texas. Through meticulous data collection and analysis, the CVES aims to inform targeted interventions and policy reforms, fostering energy equity and resilience statewide.

Supplemental: Survey Participant Demographics

Respondents were asked for sociodemographic information including employment, race/ethnicity, income, and age. The following section provides a summary of the demographics.

Table 1. Respondents Income (n = 6,579)

Annual Household Income	Income Category	Percent of Respondents
Less than $13,000	Extremely Low Income	28%
$13,000 - $27,000	Very Low Income	27%
$27,000 - $50,000	Low Income	26%
$50,000 - $80,000	Moderate Income	17%
$80000 +	High Income	2%

Table 2. Respondents Employment Type (n = 6,507)

Employment Type	Percent of Respondents
Employed for wages (salary, hourly, etc.)	44%
Self-Employed	11%
Not working and looking for work	11%
Not working and NOT looking for work	7%
Retired	16%
Stay-at-home parent	10%
Student	3%

Supplemental: Survey Participant Demographics

Approximately 53% of respondents voluntarily provided information on their race and ethnicity, providing a partial but potentially informative representation of the study sample's demographic composition. Note, the reported races were further grouped into two categories of White (non-Hispanic) and People of Color to represent the racial and ethnic identities of the respondents.

Table 3. Race of respondents (n = 3,457)

Race of Respondents	Percent of Respondents
White/Caucasian	85%
African American/Black	12%
Other	3%

Table 4. Age of Respondents (n = 6,579)

Respondents Age Group	Percent of Respondents
18 - 30 Years Old	22%
30 - 40 Years Old	30%
40 - 50 Years Old	19%
50 - 65 Years Old	20%
Over 65 Years Old	9%

Supplemental: Survey Participant Demographics

Table 5. Rural/Urban Distribution of Respondents (n = 6,558)

Location of Respondents	Percent of Respondents
Rural Area	23%
Urban Area	77%

Table 6. Home Tenure of Respondents (n = 6,579)

Home Tenure	Percent of Respondents
Renter	55%
Owner	33%
Other*	12%

**Other includes people living with someone else who is the primary occupant.*

Table 7. Housing Typology (n = 6,579)

Housing Typology	Percent of Respondents
Single Family House	65%
Multi-family House (e.g. Apartment)	21%
Semi-detached House (e.g. Townhouse)	2%
Mobile House (e.g. Manufactured house)	9%
Other	3%