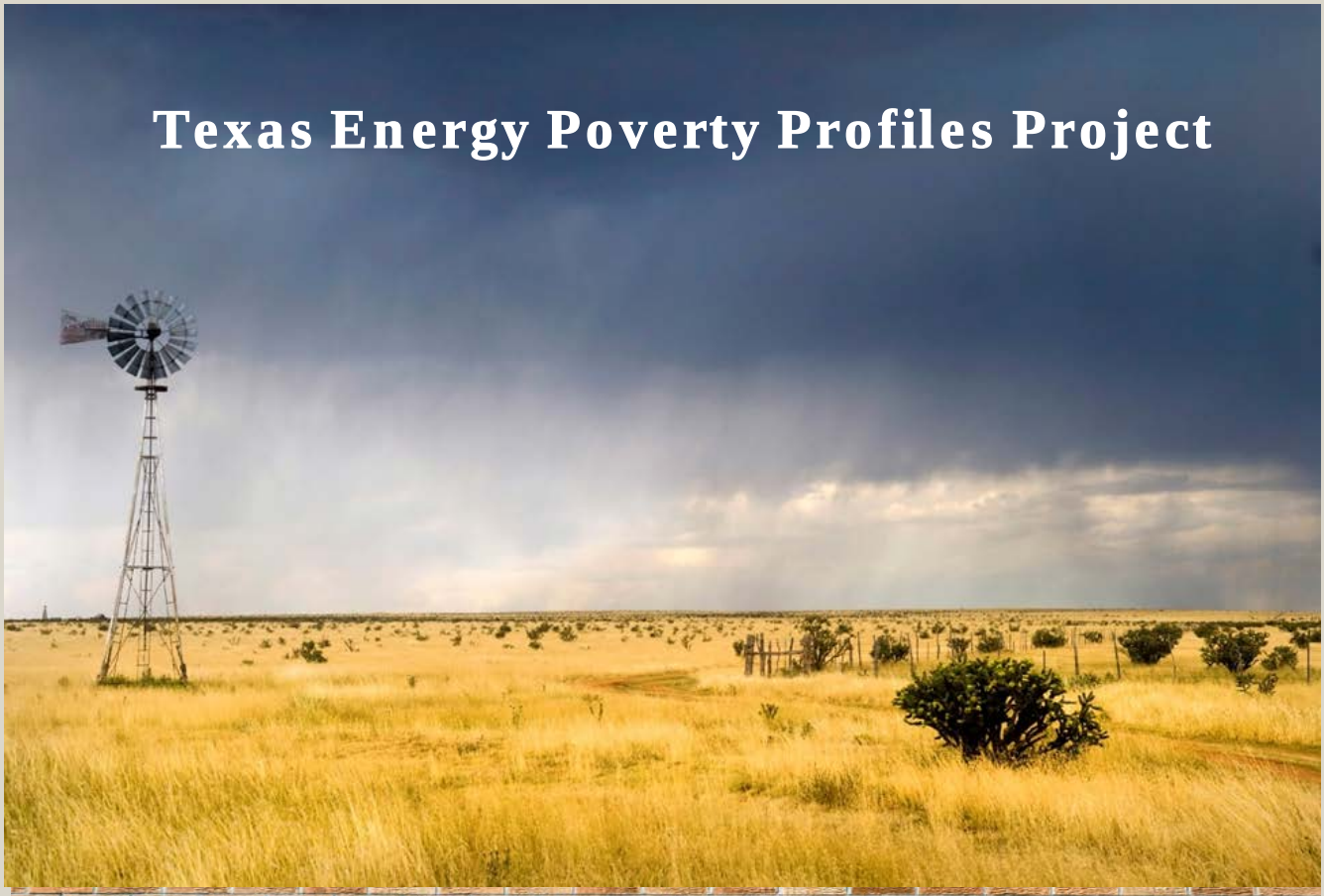
Texas Energy Poverty Profiles Project



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Texas Energy Poverty Profiles Project

PROJECT DIRECTED BY

Heath J. Prince, Ph.D.

Dana Harmon

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Policy Research Project Participants

Students

Kiran Awan, Bachelor of Arts in English, University of South Alabama, 2016; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

Sarah Garza, Bachelor of Arts in Theater, Occidental College, 2009; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

Dori Grabinski, Bachelor of Arts in English, the Ohio State University, 2014; Master of Public Affairs, University of Texas at Austin, 2018.

Reiner Hershaw, Bachelor of Arts in Political Science, University of Washington, 2012; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

Megan Maldonado, Bachelor of Arts in International Relations and Sociology, University of Texas at Austin, 2016; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

Preston Poole, Bachelor of Arts in Political Science, Rhodes College, 2012; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

George "Ned" Ryan, Bachelor of Arts in Political Science, Goucher College, 2017; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

David Saustad, Bachelor of Arts in Economics and Political Science, Boston College, 2017; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

Nathan Shaw-Meadow, Bachelor of Arts in Economics, Southwestern University, 2010; Master of Public Affairs, University of Texas at Austin, 2018.

Kat White, Bachelor of Science in Environmental Science, Baylor University, 2017; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

Rand Zeolla, Bachelor of Arts in Public Administration, Texas State University, 2016; Master of Public Affairs Candidate, University of Texas at Austin, 2019.

Project Directors

Heath J. Prince is the Director and a Research Scientist at The Ray Marshall Center for the Study of Human Resources, LBJ School of Public Affairs. His current work includes the United Nations Research Institute for Social Development's study into youth employment programs and policies in five Middle Eastern and North African countries, as well as a grant from the Netherlands Scientific Research Organization to conduct a behavioral economics experiment in northern Jordan. In addition, Dr. Prince is a principal investigator on a project for Nuru International to evaluate the multidimensional poverty impacts of its interventions in Ethiopian and Kenyan farming communities.

Dana Harmon is the Executive Director of the Texas Energy Poverty Research Institute, an organization dedicated to inspiring lasting energy solutions for low-income communities. Dana has overall strategic and operational responsibility for the organization. Her work takes a holistic approach to exploring the role energy can play in the transition from poverty to self-sufficiency. Prior to joining TEPRI in 2016, she enjoyed a 15-year career in the energy service and consumer products sectors.

Table of Contents

List of Tables

List of Figures

List of Acronyms

American Community Survey ..... ACS
Paris Climate Accord of 2015 ..... COP21
European Fuel Poverty and Energy Efficiency ..... EPEE
EU Energy Poverty Observatory ..... EPOV
Electric Reliability Council of Texas ..... ERCOT
Energy Use Intensity ..... EUI
Low-income High Cost ..... LIHC
Low- or Moderate-Income ..... LMI
Public Utility Commission ..... PUC
Retail Electric Providers ..... REP
System Benefit Fund ..... SBF
Texas Energy Poverty Research Institute ..... TEPRI

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Foreword

The Lyndon B. Johnson School of Public Affairs has established interdisciplinary research on policy problems as the core of its educational program. A major element of this program is the nine-month policy research project, during which one or more faculty members direct the research of ten to twenty graduate students of diverse disciplines and academic backgrounds on a policy issue of concern to a government or nonprofit agency. This "client orientation" brings the students face-to-face with administrators, legislators, and other officials active in the policy process and demonstrates that research in a policy environment demands special knowledge and skill sets. It exposes students to challenges they will face in relating academic research and complex data to those responsible for the development and implementation of policy, as well as how to overcome those challenges.

The curriculum of the LBJ School is intended not only to develop effective public servants, but also to produce research that will enlighten and inform those already engaged in the policy process. The project that resulted in this report has helped to accomplish the first task; it is our hope that the report itself will contribute to the second. Neither the LBJ School nor The University of Texas at Austin necessarily endorse the views or findings of this report.

Angela Evans

Dean

Executive Summary

Energy poverty describes a condition faced by many Americans in which the personal cost of energy consumption needed to maintain a healthy lifestyle creates a significant economic hardship. The Texas State Data Center estimates that low-income households spend on average 12.5% of their income on home energy costs, versus the 4.0% spent by higher income households, and energy burdens grow more acute with more severe poverty – up to 31%.

By this definition, nearly 1 in 4 low and moderate-income (LMI) Texans experience energy poverty. Texas is home to 9.4 million LMI energy customers, and high energy burdens lead to difficult tradeoffs of essential needs – forcing families to choose between paying utility bills, paying rent or mortgage, and putting food on the table.

In 2017, the Texas Energy Poverty Research Institute (TEPRI) published *Energy Poverty Research Landscape Analysis*, which revealed that reinventing energy consumer engagement is the most glaring and broadly agreed upon opportunity to improve energy service to LMI consumers. Most studies, however, convey that not enough is known about how the power sector should effectively engage LMI consumers, from needs assessment to program design - this is a gap that this research aims to address.

This study, the *Texas Low-Income Profile Project*, provides a detailed understanding of Texas LMI residents and their relationships to energy. We address this issue in a robust manner with the goal of helping frame future strategic decision-making processes for stakeholders in Texas – utilities, regulators, policy makers, non-profits, and service providers.

Methodology

In order to understand better the depth and breadth of energy poverty in Texas, we conducted a statewide survey of more than two-thousand LMI residents, as well as interviewed twenty-three LMI residents from several regions of the state. To the best of our knowledge, this study represents the most comprehensive examination of energy poverty in the state to date.

Findings

The survey produced a number of valuable findings, including insights into the prevalence of energy poverty, where in the state energy poverty is most concentrated, how it varies across income strata, inter alia. The interviews flesh out the survey data by describing how households cope given the tradeoffs that frequently need to be made between paying for an electricity bill and paying for other essentials. Common across the findings from both the survey and the interviews is an estimation of how well LMI residents in Texas understand their options for reducing energy burdens.

Policy Recommendations

These findings suggest several policy recommendations that could be pursued by policymakers, energy providers, and advocates, including, among others:

- Creating a replacement program for LITE-UP Texas, a discontinued, means-tested discount on electricity bills;
- Raising the ten percent energy efficiency budget for utility companies;
- Amortizing customers' costs for energy-efficient retrofits and equipment; and
- Increasing outreach and education related to energy efficiency.

Introduction

1.1 Overview

The term energy poverty generally describes a situation in which a household cannot meet its basic energy needs, either due to problems of accessibility or affordability.[i] From an affordability standpoint, many consider energy poverty to occur when more than ten percent of a household's income goes towards energy costs.[ii] While energy poverty encompasses households that are above the poverty line, low-income families likely experience particular difficulties and are the focus of this analysis. According to the Texas Energy Poverty Research Institute (TEPRI), "low-income households in parts of Texas pay 12% to 28% of their monthly income to cover their energy needs" (See Appendix B. Aggregate ACS Tables).[iii]

The *Texas Low-Income Community Profiles Series* provides a detailed portrait of Texas low-income residents and their relationships to energy. The project focuses its analysis on five energy burden indicators drawn from the literature: economic hardship, housing structure, health-related needs, sociodemographic profile, and household makeup.

This information is intended to be utilized to:

1. Reduce barriers to outreach and education of this consumer group.
2. Increase effectiveness of energy efficiency programs.
3. Evaluate policy and funding requirements to address energy poverty issues.
4. Clearly define market to encourage technology innovations.
5. Explore models to use renewable energy technologies to reduce energy burdens for low-income consumers.

1.2 Energy Burden Indicators

A standard definition of energy poverty is not consistent throughout the literature, as different organizations have different thresholds and metrics for what is considered energy impoverished. The University of Texas Energy Institute defined energy burden as any household that spends 8% or more of gross annual income on energy, estimating that 22% of Texan households experience energy burden.[iv] Our study defines energy burden as any household that

spends 10% or more of gross annual income on energy.[v] We measure energy burden using the indicators shown in Table 1.

Table 1. Definition of Energy Burden Indicators

Energy Burden Indicators	Description
Housing Structure	Quality of home's physical structure; energy efficiency and insulation
Economic Hardships	Financial hardships; energy burdens will mostly vary based on household incomes
Sociodemographics	Key characteristics that describe the household and surrounding community
Household Makeup	Presence of vulnerable populations; household size
Health	Intersection of energy and health costs

Housing Structure: The physical characteristics of a home play a large role in shaping a household's relationship to energy and can greatly influence the experience of energy poverty. The following variables were selected to display how the physical housing stock can impact energy burden:

1. **Year Structure Built**: The year structure built can be used as a proxy for energy efficiency of the home as older homes are generally less energy efficient and are not as well sealed as newly constructed homes. Studies have shown that the year a structure was built has an inverse relationship with home energy consumption where the newer the home is, the less energy it will consume, other factors held equal.[vi]
2. **Number of Bedrooms in Household**: The number of bedrooms can serve as a proxy for both number of individuals in the house and the size of the house. Studies have shown that the size of the house has positive impact on household energy consumption.[vii]
3. **Units in Structure**: Units in structure is an indicator denoting the type of housing unit and can have an impact on household energy consumption. Detached, single-family homes generally consume more energy than equivalent sized multi-unit homes.[viii]

Economic Hardship: Measures of economic stress of households are necessary to understand and predict energy poverty. Energy poverty is determined as a ratio of a household's income spent on energy costs, and in some cases, measures of economic hardship can be used as a proxy for energy poverty. The following variables were selected:

1. **Household Income:** The primary driver of energy burden is household income[ix]
2. **Social Service Participation**: The number of households in a region are using social services is an important indicator of the number of households that are experiencing economic hardship and in or at-risk of falling into energy poverty.

Sociodemographic Descriptors: These variables describe the people residing in communities and can indicate whether there are specific sociodemographic characteristics to be considered by energy programs. The variables selected include:

1. **Ethnicity of Householder**: In Tony Reames study on energy use, a larger portion of ethnic minority headed households were less energy efficient.[x] Bednar, Reames, and Keoleian found in their study on heating consumption and efficiency that race/ethnicity is correlated with energy use intensity.[xi]
2. **Age of the Householder**: An understanding of regional aggregations for the ages of the householders provides a sense of the generational breakdown within households, as well as a sense of their energy consumption needs. Energy needs change as cohorts age. The stage of the family life cycle of a household gives insight into the energy needs of said household.[xii]
3. **Educational Attainment**: There is a strong, negative relationship between educational attainment and energy poverty. Groups with low levels of educational attainment are often the groups suffering from energy poverty[xiii].
4. **Primary Language Spoken in Home**: Primary language spoken at home provides insight into appropriate communication methods. Approximately 25 percent of homes in Texas are homes in which English is not the primary language. Serving the needs of these communities requires knowing and understanding their location.

Household Makeup: This energy burden indicator describes the composition of each household, which can play a large role in a household's relationship with energy. The following ACS variables were selected:

1. **Presence of Elderly (65+)**: Age of the householder can play a large role in influencing home energy consumption. Some studies have shown that energy consumption increases with the presence of elderly (65+) within the household as this indicates greater time spent within the home.[xiv]
2. **Owner or Renter**: "Owner" or "renter" status can affect energy efficiency upgrades as the benefits of the energy efficiency improvements do not accrue to those responsible for making the home energy infrastructure upgrades. All else equal, owners generally consume less energy than renters.[xv]
3. **Household Size**: Household size defined as the number of individuals living in a household has been shown to have a positive relationship with household energy consumption.[xvi] Generally, households with more individuals will consume more energy than households with fewer individuals, other factors held constant. Household size can be used as a proxy for energy demand.
4. **Presence of Children (Under 18):** The presence of children (under 18) has been shown to increase residential energy usage. Children generally spend more time at home than older individuals and therefore can exert upward pressure on energy usage. Very young children can also be sensitive to ambient temperature and require tighter control of the climate range within the home. This can lead to higher energy usage.[xvii]
5. **Marital Status**: Marital status can be used as a proxy for the number of adults living in the household, and it has been shown that being married can have a positive impact on household energy consumption.[xviii]

1.3 Literature Review

1.3.1 Overview

Research regarding energy poverty, or fuel poverty, in the United States lags behind similar studies done in Europe, as well as Africa and South America. The bulk of domestic energy poverty research has taken place in the northeast, where energy burdens result from cold weather. Further, much of the research on energy poverty in the U.S. focuses on energy efficiency rather than energy poverty's impact on individuals. For these reasons, we examine both the domestic and international literature on energy poverty in order to inform our analysis.

1.3.2 Domestic Research and Policy

As with our study, other energy poverty studies have reviewed multiple demographic characteristics, including education, employment level,[xix] household ownership,[xx] race, ethnicity, and urban or rural residence.[xxi] The energy burden indicators for this project have been defined above and include the previously listed demographic characteristics. Our study does not focus on exclusively on the rural geography, but instead divides the state of Texas into 11 geographic areas based on the electricity market structure, generally urban or rural environments, and climate zones defined elsewhere in this report.

Other studies explore energy burdens through the lens of qualitative interviews with low-income renters to hear directly from the affected parties about their experience living with energy burdens. The focus on low-income renters is important as it illuminates the split-incentive dilemma faced by owners and tenants of rental property. In some rental arrangements, the owner of the home does not pay the utility bill and thus the incentives for energy-efficiency improvements to these homes are minimal leading to relatively higher energy bills.[xxii] Another study reviewed energy burdens from the angle of multi-family units and the impacts that energy efficiency improvements can have on affordability.[xxiii] Our study includes owner versus renter as a part of the household makeup energy burden indicator and will also contain interviews with low-income households to document their specific experience with energy burdens.

Battarchaya et al investigated changes in nutrition during unusually cold weather events. The study found that while both poor and rich families increase expenditures on energy/fuel during these unusual cold weather events, poor families generally decreased food expenditures

by an equivalent degree.[xxiv] A Child Health Impact Working Group study found that unaffordable energy expenses can lead to significant and preventable adverse children's health outcomes.[xxv] This project will leverage the interviews and survey data to flesh out some of the interactions between health and energy burdens.

Our study takes a historical approach and reviews the development of current energy policy/programs for low-income consumers, finding an emphasis among federal policies on alleviating heating needs of low-income customers, while policy at the state level shifts responsibility for energy programs to the utility provider. Industry restructuring would further impact the success of these programs; thus, our study offers new policy options that would effectively allow for program development to coincide with future industry changes.[xxvi]

The "Report on the Impacts and Costs of the Iowa Low-Income Weatherization Program - Calendar Year 2006" summarizes the activity, including specific program spending, impacts, and energy cost savings by participants of this program throughout 2006. The paper accounts for changes in clientele and housing conditions and offers recommendations to improve the program. [xxvii] Similar reports for other states are also available and provide references for program design and policy improvements to consider as a part of this study.

The "LIHEAP Case Study on Energy Burden for FY 2005" evaluates the extent to which the LIHEAP program serves households with the highest energy burdens. Data from the 2001 Residential Energy Consumption Survey was used to identify high burden households based on the distribution of consumer incomes and energy burdens. The study measures how the LIHEAP program served those high burden households effectively in 2001, finding that the program did alleviate some of the burden but did not provide additional assistance when there was additional burden.[xxviii]

Finally, a third program evaluation report, "Concerns over the Allocation Methods Employed in the US Low-Income Home Energy Assistance Program,"[xxix] reviewed the LIHEAP program. The study notes that distribution of funds among states does not correspond to need for assistance. According to the report, the northeastern states receive more support than needed, while southwestern states receive less than needed. The study concludes noting that congressional reform of the program could effectively resolve this issue.

1.3.3 Texas Research and Policy

In the past, the State's low-income families were offered assistance through the LITE-UP Texas program. However, this program expired in 2016, coinciding with the depletion of the System Benefit Fund (SBF), which sustained the program.

The 85th Texas legislature, while not restoring the SBF, adopted related provisions in SB 1976, which amends Texas law for assistance programs provided by retail electric providers (REPs). Before SB 1976, Texas law required REPs to compensate the Public Utility Commission (PUC) for maintaining a list of low-income customers and guaranteed certain protections to those on the list. The new legislation explicitly precludes the PUC from requiring REPs to offer assistance but permits utilities voluntarily to provide programs. SB 1976 also allows the PUC to continue offering access to lists of low-income customers upon request and reimbursement of cost. The new legislation has raised concerns among some that the absence of a requirement means that REPs will no longer make efforts to assist their low-income customers. Providers appear dedicated, however, to continuing to offer benefit programs and working to understand better their energy-burdened customers in order to make these programs more effective.

1.3.4 Global Research and Policy

Studies on energy poverty have been conducted in nearly every region across the world. However, the definition of energy poverty varies based on regional context. The literature from developing nations tends to focus on fuel quality, indoor pollution, and health. The literature from developed nations also discusses health and provides further insight about a wider range of energy poverty indicators, including socioeconomic status, housing structure, and behavioral influence.

The World Health Organization finds that energy poverty compromises health outcomes for communities in developing nations.[xxx] More than 3 billion people worldwide use solid fuels for their basic energy needs. Burning solid fuels within the home is inefficient and dangerous, and produces health-damaging pollutants like carbon monoxide.[xxxi] The resulting indoor air pollution significantly increases disease burdens across the Global South and is responsible for approximately 2 million excess deaths annually.[xxxii] Although most LMI consumers in Texas have access to infrastructure that eliminates the need for solid fuels, it is possible that households

might resort to pollution-causing methods to cook or heat their homes in order to minimize energy costs.

These limited energy options and poor fuel quality contribute to a mutually reinforcing cycle of health problems and socioeconomic immobility. Household livelihoods depend on family members being healthy enough to go to work and care for their dependents.[xxxiii] However, because household income is an important determinant of fuel quality,[xxxiv] poor households are disproportionately affected by health problems as a result of indoor air pollution, which thus imperils their earning potential.

The European Commission and Danish manufacturing company, VELUX, recently released a report called *Healthy Homes Barometer 2017*, which finds that "twice as many people have poor health when living in energy poverty."[xxxv] The combination of poor structural integrity and inadequate heating/cooling access yields dampness and mold within buildings. Poor indoor air quality, in turn, leads to increased risk of respiratory disease, infection, and other medical contraindications for youths, the elderly, and the disabled.[xxxvi] Other studies have established a significant relationship between energy poverty and mental health effects on adults and adolescents.[xxxvii] Negative health outcomes caused by damp and/or moldy structures cost the EU billions of euros per year in healthcare costs, as well as resulting in decreased productivity.[xxxviii]

Energy poverty not only stifles financial growth for individual households, it can also affect the economic wellness of a community or country as a whole. In providing heat, power, and light, energy services are a crucial prerequisite for the development of "business, industry, commerce, and public services such as modern healthcare, education, and communication."[xxxix] Rural communities in Texas may face similar development obstacles due, in part, to a lack of comprehensive energy services.

Awareness of energy poverty is on the rise in Europe, garnering interest from both EU institutions and the private sector. The bulk of recent research from the EU stems from clean energy initiatives proposed by the Paris Climate Accord of 2015 (COP21). In 2018, the European Commission launched the EU Energy Poverty Observatory (EPOV) as a part of its 'Clean Energy for All Europeans' legislative package. Funded by the European Commission, the EPOV project is a 40-month public-private partnership among 13 organizations, including think tanks, advocacy groups, and the business sector. EPOV "aims to provide [an] . . . open-access resource that will promote public engagement on the issue of energy poverty, disseminate information and

good practice, facilitate knowledge sharing among stakeholders, as well as support informed decision making at local, national and EU level."[xl]

Research on energy poverty in the EU is a product of the interaction between "low household incomes and thermally inefficient homes."[xli] Because energy inefficient homes are more expensive to heat, low-income residents have relatively higher energy costs than consumers with more disposable income. Moreover, the "specific inequality patterns and housing stock structure"[xlii] throughout the EU illuminates other factors that contribute to energy poverty, including "patterns of housing tenure, the nature of heating systems, as well as socio-demographic circumstances such as household size, gender, class, or education."[xliii] The European Fuel Poverty and Energy Efficiency (EPEE) project[xliv] is a widely cited study that establishes variables and parameters to define energy poverty in Belgium, Spain, France, Italy, and the UK. EPEE cross-references three indicators of building structural integrity with demographic indicators, national surveys, and the nature of heating systems to locate the cause of high rates of energy poverty within "the familiar context of low household incomes, insufficient heating and insulation standards, and high energy prices."[xlv]

Work by Herrero and Bouzarovski in fuel poverty experience was based on region, climate, economic conditions, regulatory contexts, demographics, reliance on different fuel types, and cost of energy.[xlvi]

The European Commission Directorate-General for Energy published a study on measuring energy poverty in 2015 in which they defined it broadly as the incapability of individuals or households to meet required energy service needs at an affordable cost. Drawing on research from across the EU, the study assessed 178 energy poverty indicators. The measurement of energy poverty is broken into two frameworks, consensual based and expenditure based, which are further broken down into subcategories.[xlvii]

The consensual framework includes self-reported survey responses about an individual's assessment of whether or not they are capable of meeting their energy needs. The expenditure framework uses financial metrics to identify whether or not a home is energy poor. This can be the 10% income threshold or a Low-income High Cost (LIHC) metric, or not. A "minimum income standard" designates a "minimum level of income needed by different households in different locations to participate in society."[xlviii] Under the minimum income standard, a household is in energy poverty when "net income after housing costs is insufficient to meet

energy costs after other costs of living are considered." Belgium has the additional metric of hidden energy poverty where households with abnormally low energy expenditures may be experiencing energy poverty.[xlix] Energy expenditures can be measured either in actual amounts via surveys or be estimated.

The expenditure and consensual indicators are supplemented further by supporting indicators, which are contributors to energy poverty that help to explain it.

Other studies explore the urban/rural divide in terms of energy poverty and have found rural areas to be more susceptible to energy poverty given that they are isolated from urban population centers and the resources therein.[l]

Lastly, a study of approximately 5000 households across the EU and Norway found that "family age-composition patterns are found to have a distinct impact on household energy use behavior"[li] and the coping strategies that they employ. Researchers have identified 3 major coping strategies used by energy poor consumers to fund their competing household needs: (1) Direct Financial Trade-offs, (2) Fuel Rationing, and (3) Increasing Household Debt.

1. **Direct Financial Trade-offs:** Households often dip into funds for other bills in order to balance high-energy costs with basic needs. When it comes to picking and choosing which bills to pay, food and fuel are a common trade-off because both commodities are perceived to be amenable to daily variation, unlike fixed costs such as rent.[lii] This tradeoff strategy was found to be easier and more common than other ways of reducing energy bills, like switching energy providers.
2. **Fuel Rationing:** Fuel rationing does not have a fixed definition but generally describes the decision to keep temperatures lower, only heat certain rooms, and/or limit heating to certain times of the day. This strategy is often used by elderly people[liii] but has been observed in households across age groups.[liv] Self-disconnection of energy services is also considered to be a subset of fuel rationing.
3. **Increasing Household Debt:** Younger households mostly use this strategy, and, in particular, by parents who prioritize the health and comfort of their children. Beyond household composition, education level also impacts knowledge about household energy use and conservation behaviors. Higher levels of education are associated with

the adoption of energy efficient technology and environmentally motivated conservation efforts.[lv]

1.3.5 Private Research and Initiatives

1.3.6 Data Analysis Review

During the conduct of a literature review regarding data analysis of similar survey reports, two specific reports were used to frame our analysis. The first was the Nexant "California Statewide Opt-in Time-of-Use Pricing Pilot,"[lvi] and the second was the European Commission's "Selecting Indicators to Measure Energy Poverty."[lvii] Both reports specifically address the development of energy poverty hardship indicators.

California Statewide Opt-in Time-of Use Pricing Pilot

The Nexant researchers compiled survey data for review to "facilitate comparisons and…identification of differing views" regarding utilities in California.[lviii] They utilized a detail oriented, methodical process to develop, collect, and analyze their data. Including individual survey analysis, longitudinal survey analysis, and advanced statistical modeling, they captured a wide swath of reportable data across multiple spectrums. Their full data analysis process was as follows:

This agency explicitly reviewed multiple facets, including survey disposition and question response frequency, to determine the validity and reliability of their findings. All analysis was conducted using SPSS and R. Advanced statistical modeling was used to focus on identifying "attitudinal, segment, or demographic predictors of hardship" across their sample.[lx] Developing each survey question with a specific research question in mind, survey questions were recorded with the structured formula of:

Nexant specifically identified their preliminary groups (demographics, enrollment method, etc.) and metric descriptions (degree of hardship, electricity burden, etc.). From there, they employed multiple methods, including:

1. calculating descriptive statistics;
2. conducting statistical comparisons;
3. Used questions as dependent variables in regression analyses to estimate the effect of selected independent variables; and
4. Created messaging metric for use as a control variable in regression analysis.

European Commission Report

The European Commission Report was slightly different but also useful. Conducting statistical analysis from existing data, the researchers assessed how "energy poverty metrics correlate with each other" and "how different measures are influenced by a number of supporting indicators."[lxi] For their methods, the European Commission analyzed the data sets with common linear models for continuous metrics and logit models for binary metrics.[lxii] When capturing their analysis, the European Commission recorded their findings with a similar model to Nexant:

This type of logical flow is necessary for the planning, execution, and recording of data. With regards to energy poverty, these models influenced our reporting and analytical procedures.

1.4 Research Overview & Structure

1.4.1 Research Mission

The research team sought to understand better the concept of energy poverty as it applies to the state of Texas. Our objective was to provide region-level geographic data about low-income communities that experience economic impacts related to their energy burden. This

report is intended to be useful for stakeholders by helping to improve outreach from utility companies regarding assistance with meeting household energy needs.

1.4.2 Report Overview

The main purpose of this report is to give an overview of energy poverty in Texas using our five energy burden indicators. This report will show the demographics and geographic areas that face the greatest levels of energy poverty so that energy and poverty stakeholders will know where to focus their resources. This report begins to examine what aspects lead to energy poverty, as well as the ways that energy poverty negatively affects people's economic and health well-being. While focused on showing the extent of energy poverty in Texas, this report will serve as a foundation for future research to delve into the issue more deeply.

1.4.3 Report Structure

The report is structured as follows: following the project overview and literature review presented above, the next section addresses the methodology used to gather the data on which the report is based. Following a discussion of methodology, we report on energy poverty in Texas, across 11 regions, to examine how energy poverty affects people in different areas of the state. The report will be a broad analysis to discuss the overall takeaways from our research. Along with the data, the report also presents findings from the interviews with people living in energy poverty.

2. Methodology

2.1 Introduction

In order to understand the prevalence of energy poverty in Texas, we pursued multiple approaches. First, we examined data made available through the U.S. Census's American Community Survey (ACS) to identify demographic, socioeconomic, and various housing-related characteristics by geographic region. ACS data serves as a comparative tool for the quantitative data collected from the statewide survey. This household survey was fielded statewide to gather data on intra-household effects related to energy use and energy poverty. Finally, and in order to

contextualize the survey findings, we conducted interviews with participants in energy assistance programs. Additional detail on methods is provided below and in the appendix.

2.2 American Community Survey Data Methodology

2.2.1 Data Collection

Data was collected from ACS using 2015, 5-year county level data estimates from the state of Texas. Each specific ACS dataset is referenced with the relevant descriptive statistics tables in the appendices.

2.2.2 Data Aggregation

Data were combined into aggregate descriptive statistics for each of the 11 geographic regions described below. Only Loving County was missing data in certain datasets. Loving County is located within Region 10 and is one of the smallest counties in the nation with a population of about 110. Loving County was excluded from the final aggregate descriptive statistics when the data was missing (Household Income B19001).

County-level data was aggregated into the 11 geographic regions with the statistical analysis package "R" using the Tidy-census and ACS packages which followed protocols which accounted for differences in the margin of errors for the estimates.[lxiv]

2.2.3 Data Analysis

The ACS Census data reports raw numbers for each specific category within a data table (for example, number of married respondents vs. number of unmarried respondents in each county). These raw numbers were used to create categorical percentages for each descriptive statistic. Some of the descriptive statistical categories were collapsed to reduce the total number of categories reported for an individual statistic. For example, the ACS data for *Year Home Built* included responses in 10-year increments with *1939-earlier* as the earliest reported category. A new category was created, *1969-earlier*, which combined all the earlier responses into this combined category to reduce the total number of categories reported. Raw ACS data files are available upon request.

2.3 Survey Methodology

The *Texas Low-Income Communities Profile Series* survey includes questions related to housing characteristics, financial hardships, healthcare, home energy efficiency, and the demographics of survey respondents from around the state of Texas. The goal of the survey was to understand better how energy poverty affects regional populations of the state differently.

It is important to note that this survey and its findings are exploratory in nature. Additional research is needed to understand more fully the effects of energy poverty on low-income Texas residents.

2.3.1 Survey Design

The survey questionnaire was designed using Qualtrics, a web-based data collection and analysis tool. Research teams of two explored and designed survey questions for each of the five energy burden indicators: housing characteristics, housing makeup, economic hardships, sociodemographics, and health. A literature review on existing energy research and these energy burden indicators (see Literature Review section above) informed the creation of each question in the survey. Each team provided justification, reasoning, and a citation from the literature review for each question as to how it would provide insight into or answers to research questions related to energy poverty.

The survey draft was reviewed by external researchers for accuracy, repetition of questions, style, consistency, and empirical validity. Other changes to the survey included edits to question phrasing, response options, skip logic, and the placement of question modules within the instrument. There were two rounds of edits: after the first draft was created and before the final draft was disseminated.

Prior to fielding the survey, the project's team members pilot-tested the survey to identify the need for any additional edits, as well as to evaluate the respondent's "user experience" and to adjust the instrument to minimize "survey fatigue."

The final instrument contained 5 question modules, each relating to specific energy burden indicators, as defined in Section 1.3 of this report:

1. Demographics

2. Housing Characteristics
3. Energy Efficiency
4. Financial Situation
5. Healthcare & Insurance

The instrument was then programmed into Qualtrics, allowing the survey programmers to implement skip and display logic, as well as to make the survey user-friendly and minimize respondent burden. The final draft of the instrument is in included in Appendix A.

2.3.2 Survey Dissemination

The survey tool was disseminated online through a third-party panel provider procured for the purposes of this study. Only respondents over the age of 18, those who have lived in Texas for more than six months, and those whose household income is under $75,000 a year before taxes in 2017 were able to participate in the survey.

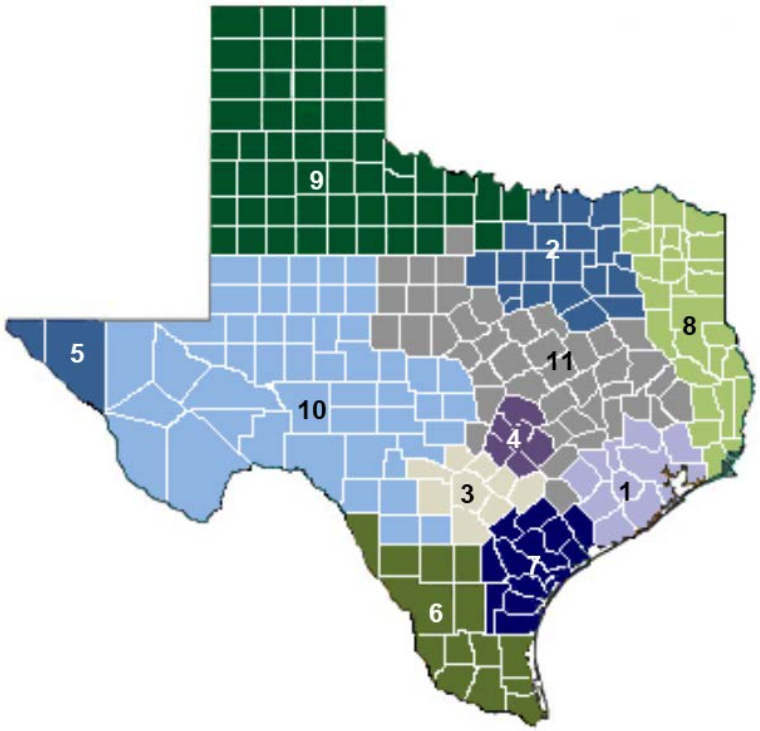
2.3.3 Survey Sampling

The following is a table showing the sample size for each geographic region. The survey fielded with 100% feasibility and received full region completion.

Table 2. Region Sample Sizes

Region	Sample Size	Region	Sample Size
1-Houston Metropolitan	385	7-Corpus Christi Metropolitan	68
2-Dallas/Fort-Worth Metroplex	385	8-East Texas	97
3-San Antonio Area	271	9-Texas Panhandle	165
4-Captial Area	208	10-West/Central Texas	208
5-West Texas	68	11-Waco Area	68
6-Southwest Texas	97		

Figure 1. Map of Geographic Regions



The above figure represents a map of the geographic sampling regions. Further information about how the sampling regions were assigned is included in Appendix B. Aggregate ACS Tables.

2.3.4 Data Processing

The data was cleaned using R by the project's graduate research assistant, and each response was assigned the appropriate region representing a specific geography of Texas. Respondents were required to provide their zip code to determine their geographic region, as defined by TEPRI's previous research. The following sampling goals were set; the data should:

- provide an accurate representation of Texas at the state level
- be the highest feasible resolution
- reflect unique Texas communities
- represent a cross-section of LMI Texans

Researchers used a stratified random sampling approach to create a representative sample of Texas. In a stratified sample, regions are used to ensure that 1) sufficient data are collected across sub populations, and 2) the sample represents communities across the state according to the relative proportions of their populations.

Researchers analyzed the data using Microsoft Excel by energy burden indicator, identified above. They then used pivot tables to analyze the descriptive statistics for each energy burden indicator for the state of Texas and each geographic region.

2.3.5 Energy Poverty Variable

To determine a household's energy burden, the self-reported energy bill amount for the period examined is divided by the resident's income for that period. Researchers then looked at energy burden based on the maximum energy bill divided by monthly income (the midpoint divided by 12) and by the average energy bill divided by the midpoint yearly income. After gaining the energy burden, researchers sorted this variable so that only respondents whose burden was at ten percent or more were included. This showed which respondents were in energy poverty (for more information on the energy poverty variable, see Appendix B. Aggregate ACS Tables).

2.4 Interview Methodology

A team of three graduate student researchers began by identifying four questions that pertain to the behavioral motivations of energy consumption, listed below:

1. What motivates energy conservation among LMI Texans?
2. What control do LMI Texans feel they have over energy costs?
3. What tradeoffs do LMI Texans make in response to high-energy burdens?
4. Of what utility assistance programs, energy efficiency programs, weatherization programs, and other energy programs are LMI Texans aware?

These research questions were developed by considering the five energy burden indicators and conducting gap analyses on the questions included on the American Community Survey state profile for Texas. Each research question was broken down into key researchable issues that were assigned prospective response categories based on information from the survey responses. The research questions, researchable issues, and prospective response categories were then organized into a supporting matrix that was used to formulate an interview script.

The interview script was designed to route each respondent through a series of questions that exhausted each research question and researchable issue. This interview design was intended to prompt the respondent to make connections between their lived experiences, priorities, and patterns of energy use. The final interview instrument was reviewed by social science researchers and the project's graduate research assistant.

In order to recruit participants, the interview team contacted organizations across Texas that serve low- and moderate-income residents. Because researchers did not collect any identifying information from participants, anonymous clientele lists from these organizations were relied upon in order to verify that a participant fell within the target income demographic. Three agencies committed to connecting the interview team with participants. Interviews were conducted both in-person and over the phone and ran approximately thirty minutes in length. Participants were compensated with a $15 HEB gift card upon completion of the interview.

2.5 Models and Other Methods

2.5.1 GIS Mapping

The goal of the GIS component of this project was to visualize the American Community Survey (ACS) 2011-2015 data by the sampling regions profiled in the final report. ArcGIS Desktop was used to create maps of the 11 sampling regions. The U.S. Census Bureau provided the TIGER/Line® Shapefiles, which were then merged by Public Use Micro Areas (PUMA) to get the sampling region areas. The goal of the GIS component of this project is to visualize the American Community Survey (ACS) 2011-2015 data by the sampling regions profiled in the LBJ School's Policy Research Project final report. ArcGIS Desktop was used to create maps of the 11 sampling regions. The U.S. Census Bureau provided the TIGER/Line® Shapefiles, which were then merged by Public Use Micro Areas (PUMA) to get the sampling region areas. Maps for each of the 11 sampling regions are reproduced in Appendix D.

3. Full Texas Profile

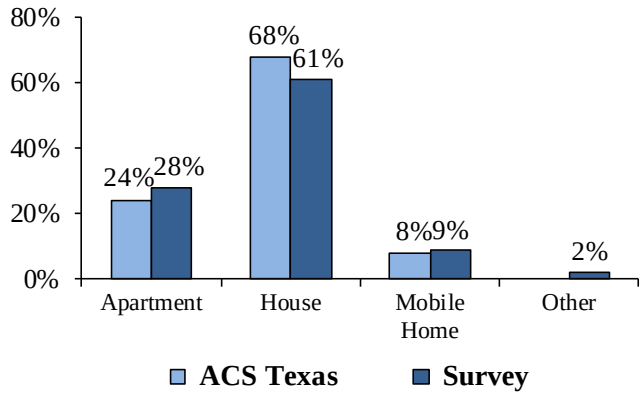
3.1 American Community Survey Data versus the Texas Communities Profile Series Survey Data

This section compares energy burden indicator descriptive statistics from the American Community Survey with survey respondent data for the same energy burden indicators. This comparison demonstrates similarities and differences between the survey data and the ACS data. A key difference between the two groups is the ACS data is a representation of the full Texas population, while the survey responses are restricted to households earning less than $75,000 annually.

3.1.1 Housing Structure

As Figures 2-3 below demonstrate, our survey and the ACS data largely correspond with regards to housing type and the year the home was built, with the exception of the larger percentage of our survey respondents indicating that they either did not know what year their home was built, or that their home was built after 2010.

Figure 2. Census versus Survey — Housing Type

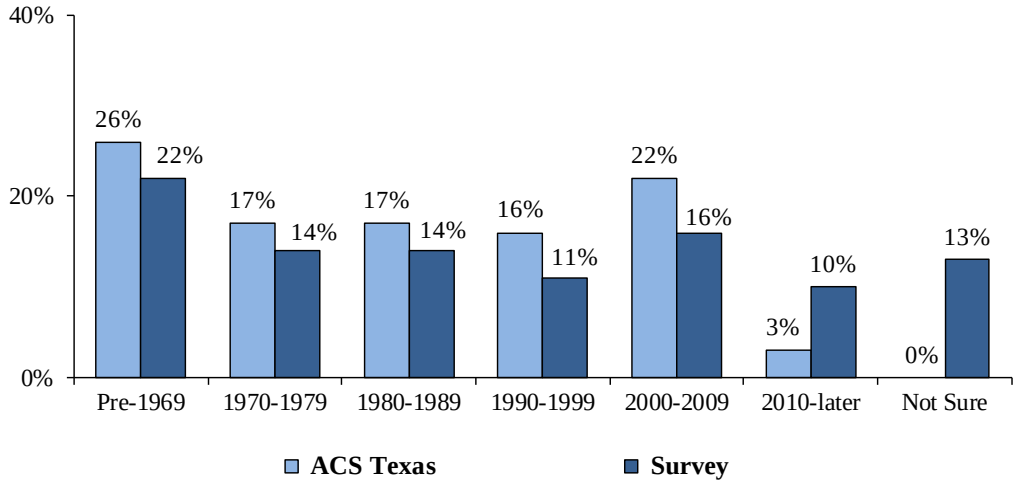


*ACS Table B25024

**Variables are not an exact match. ACS table is number of units in structure.

1-unit = house, all other = apartment or condominium, mobile home, and "other" are combined.

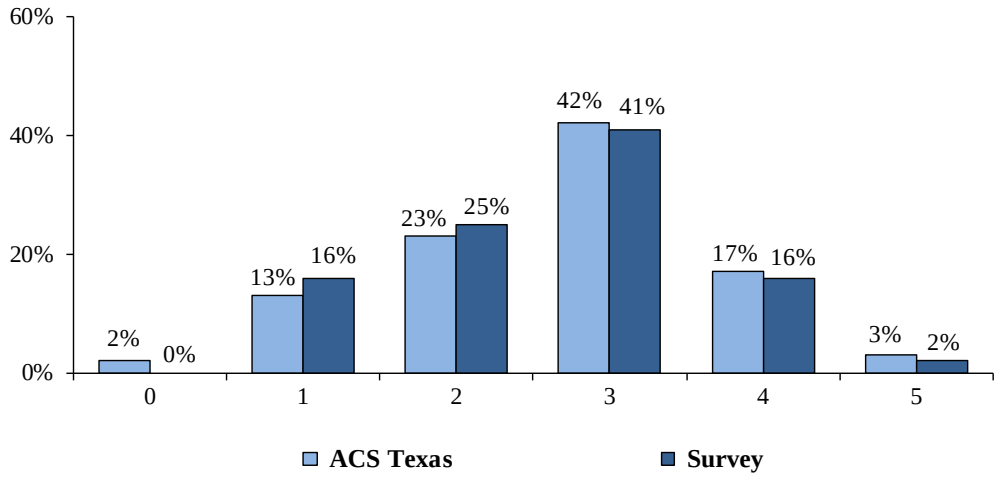
Figure 3. Census versus Survey — Year Home Built



*ACS Table B25034

Figure 4 below, again, suggests validation of our survey when compared to the ACS in that percentages are largely similar between the two surveys as regards size of house, as proxied by the number of bedrooms. However, as indicated by Figure 5, a larger percentage of our survey respondents indicated that they were renters than respondents to the ACS, which is a potentially important finding given that the issue of the "split incentive" plays such a large role in energy consumption, particularly among LMI households.

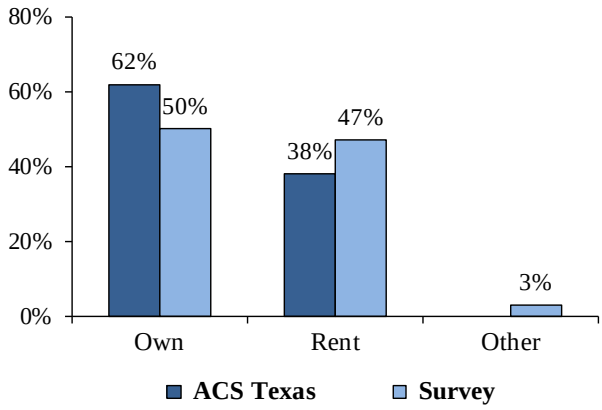
Figure 4. Census versus Survey — Number of Bedrooms in House



*ACS Table 25041

**ACS Texas variable was 5 or more bedrooms and our survey was exclusive to 5.

Figure 5. Census versus Survey — Home Ownership

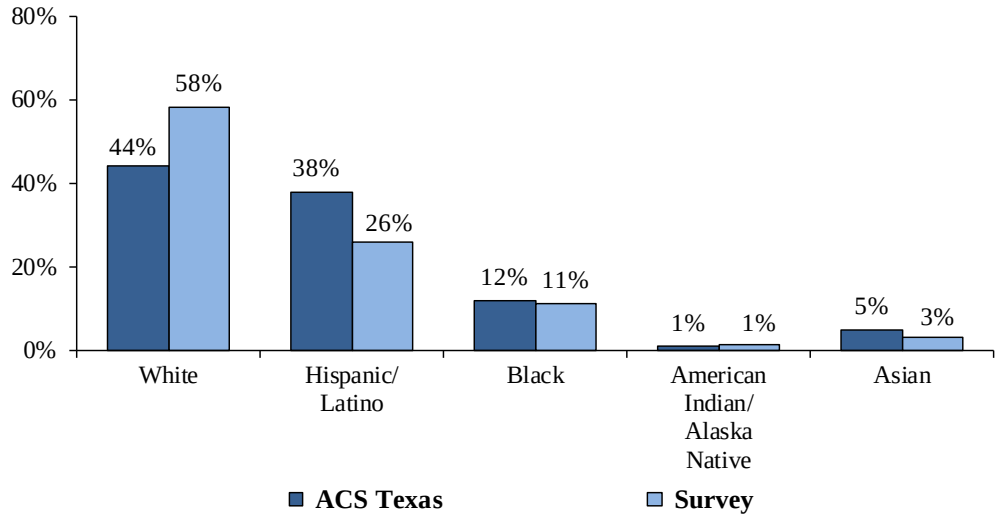


*ACS Table B25003

3.1.2 Sociodemographics

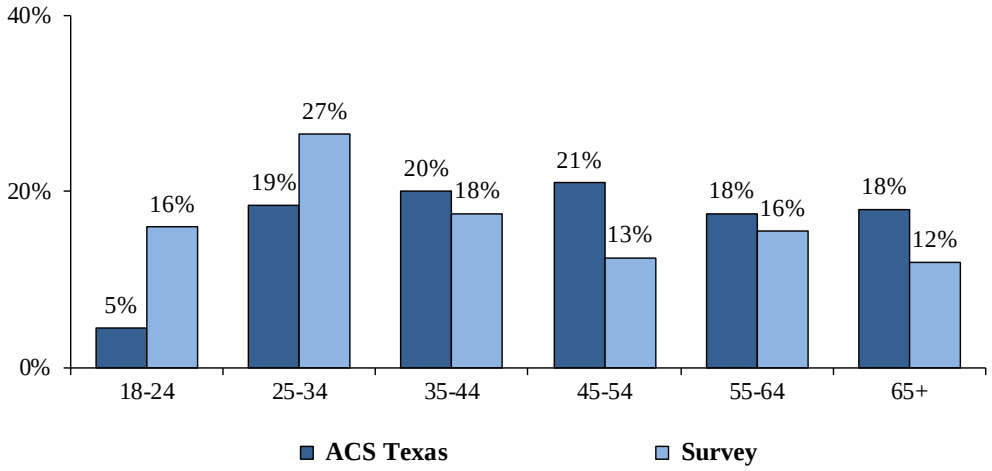
Figures 6 and 7 indicate that our survey is roughly in line with findings from the American Community Survey of Texas with regards to ethnicity and age.

Figure 6. Household Ethnicity



*ACS Table B03002

Figure 7. Census versus Survey — Age of Household Occupants

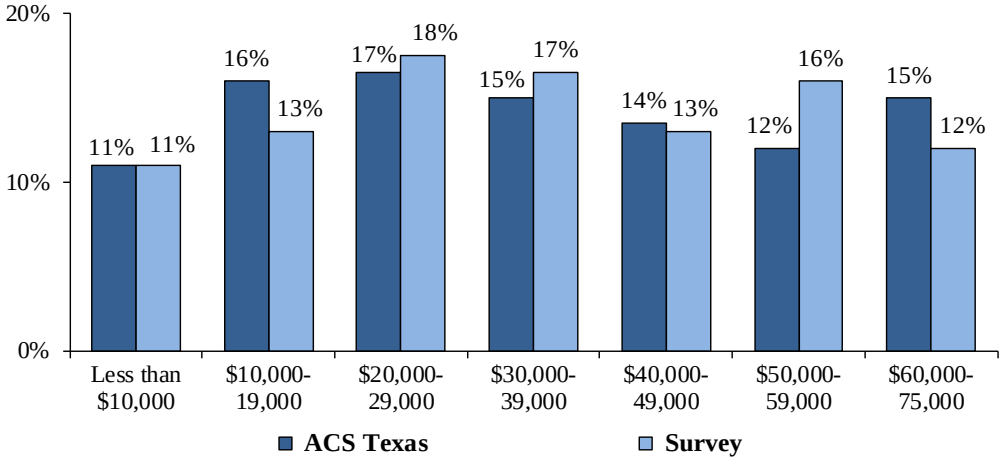


*ACS Table B25007

**The ACS and Survey did not match categories perfectly, the ACS records householders ages "15 to 24" as its lowest category, 18 was the age restriction for those eligible to take the survey.

Figure 8 depicts the low- and moderate-income distribution of surveyed households, as well as indicates that our survey is as representative as one would expect of a typical income distribution.

Figure 8. Proportion of Low to Moderate Income



*ACS Table B19001

3.2 Survey Findings

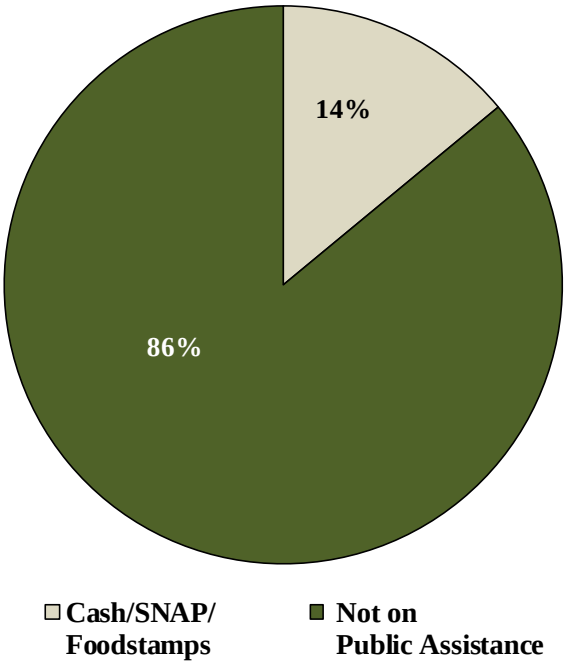
Among the survey respondents, 476 households, almost a quarter of them (24%), face energy poverty (having an energy bill that represents ten percent or more of their income), with 333 households (16%) facing year-round energy poverty.

Most regions exhibit similar levels of energy poverty as the state total, 24%. However, Regions 6 and 7 stand out with an energy poverty rate of 43% and 37%, respectively.

Among income levels, 80% of households that make less than ten thousand dollars experience energy poverty, while 62% of households that make between ten and twenty thousand dollars annually experience energy poverty. Residents between eighteen and twenty-four have the highest rates of energy poverty at 35%, and residents 65 and older have the lowest rate experiencing energy poverty at 15%. White residents experience the lowest rates of energy poverty at 19%, while black and Latino residents have the highest rates of energy poverty at 30%. People living in mobile homes experience the highest rates of energy poverty by housing type at over 40% experiencing energy poverty. People in apartments have the lowest rates of energy poverty by housing type at 20% facing energy poverty.

Figure 11 indicates that 86% of respondents to our survey received no public assistance, despite incomes of less than 200% of the poverty level (the cut-off for inclusion in the survey).

Figure 9. Proportion of Households with Public Assistance



3.2.1 Demographics

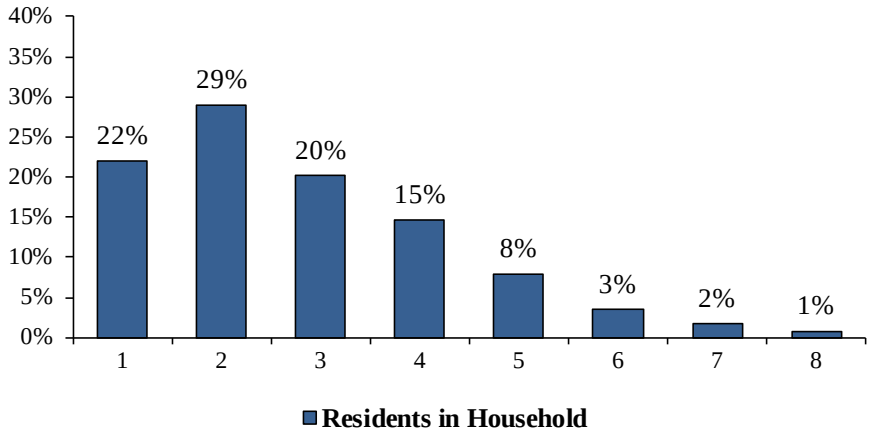
See Appendix C below for data on age, income, household size, age composition of household, relationship among household members, length of residence at current address, home types, among others.

3.2.2 Housing Characteristics

Painting a picture of who lives in energy poverty, our survey indicated that the average low-income Texas household contains approximately three permanent residents, of which approximately one are members under the age of 18, and two are adults. These age findings had little variation across the survey. As an example, the number of 18 year old residents ranged from 2.19 (Region 5) to 2.67 (Region 6) residents, and the number of residents under 18 ranged from 0.7 residents (Region 2) to 1.3 residents (Region 6). This is important to consider because larger families typically experience higher rates of overall poverty.[lxv] Whether these two variables are correlated is contested, but it is an important consideration when looking at poverty

and energy poverty. Household expenditure on living expenses increases as the number of residents increase, thus placing a burden on the financial situation of low-income households.

Figure 10. Average Number of Permanent Residents in Household—Texas

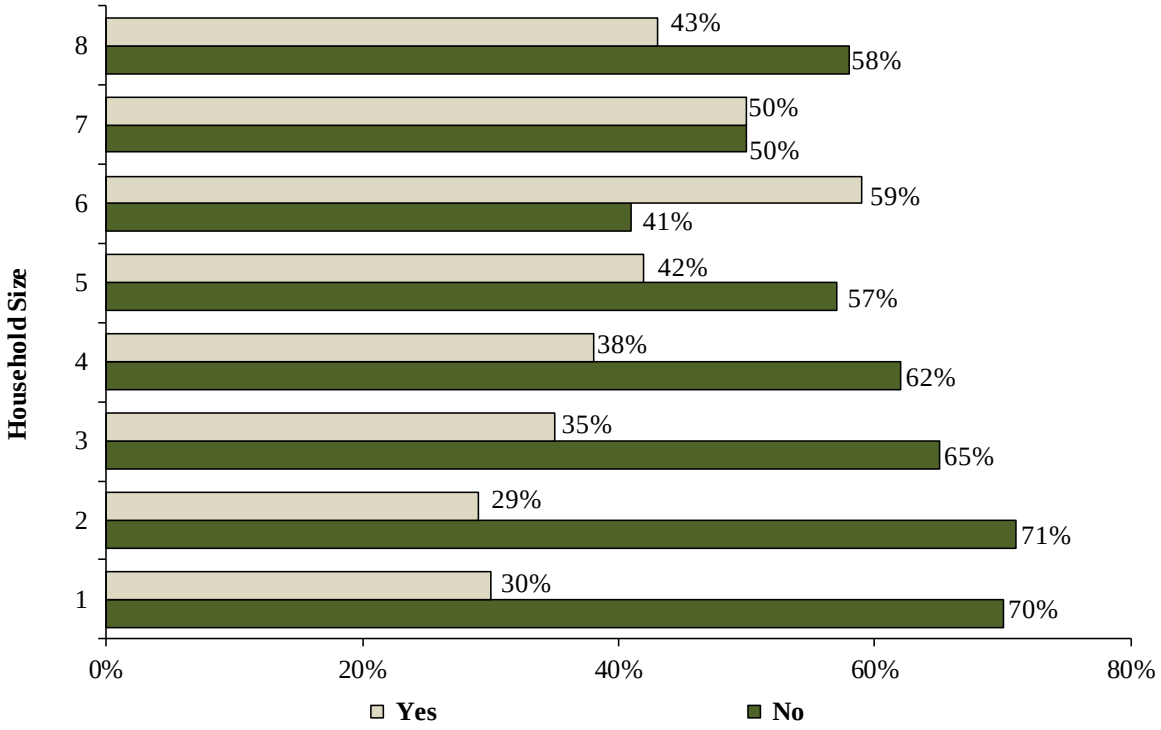


Since the majority of households fall between one and four residents, researchers classified any household at or over five residents as large. Of all Texas households surveyed, an average of 14% have five or more members living within the house. Within the state, Region 6 has the highest average ratio of households containing five or more people at 22%. Since most households fell between one and four residents, researchers specifically looked at income level for those households compared to households having five or more residents. The data from our survey indicates little difference in household income between one to four permanent residence and five or more as seen below.

Figure 11. Average Size of Household and Income —Texas

Our findings indicate that there may be little variation in income levels between one to four resident and five or more residents households, yet researchers observed a potential pattern regarding the number of permanent residents who expressed difficulty paying their electricity bill. Our survey does indicate that as households increase in size, respondents claimed to have experienced “difficulty paying electricity bill” at a higher rate (n = 1310, observations over 8 residents were excluded due to small response inputs). And, if researchers exclude the small sample size (n = 16) of 8 resident responders, the pattern becomes more defined. This may be attributed to larger electricity consumption needed to sustain larger families. While incomes are the same, the demand for energy is higher in larger families. See graph below for visualization.

Figure 12. Average "Difficulty Paying Electricity Bill" per Permanent Residents — Texas



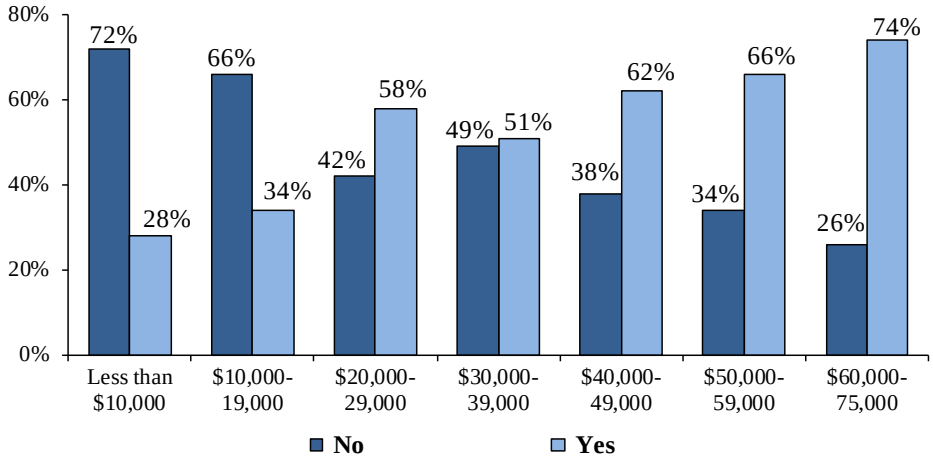
Considering this pattern, it was important to look at the distribution of households given size and income. Our survey indicated that as the number of permanent residents increased, overall, researchers saw little variation in household income (n = 2003). This is significant because, as mentioned above, energy demand will increase as the number of residents increase. Since we did not observe a substantial increase in household income, we conclude that larger households face more challenges regarding energy poverty. See chart below for visualization.

Figure 13. Household Income and Number of Residents — Texas

Within our respondents, approximately half (55%) of the low-income households surveyed contained a married couple (n=1572). This is important because the literature has indicated that poverty is higher in single parent households, and the average size of a Texas household is two adults and one minor. Since our survey found low-income families are married at a rate higher than the Texas average of 50%,[lxvi] the relationship between marital status and energy poverty was not examined in depth.

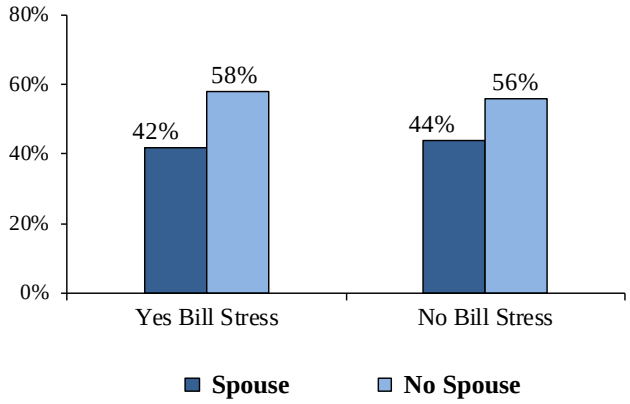
That being the case, researchers examined the relationship between household income and presence of spouse. Given the demographics observed in Texas, two residences above the age of 18 and one below the age of 18, it is not surprising that there is a strong relationship between household income and the presence of a spouse. Assuming both are working adults, this fits our expectations given the demographics observed (n = 1557). See Table 16 below.

Figure 14. Spouse in Residence and Household Income — Texas



While this relationship appears strong, our survey did not indicate that the presence of a spouse alleviates the stress of certain bills (electricity). If higher income is associated with the presence of a spouse, researchers would expect to see less stress associated with fulfilling financial obligations. As shown in Figure 17 below (n = 1557), this is not the case as married and unmarried households observe near identical levels of stress regarding electricity bill.

Figure 15. Average Presence of Spouse and Stress from Electricity Bill — Texas

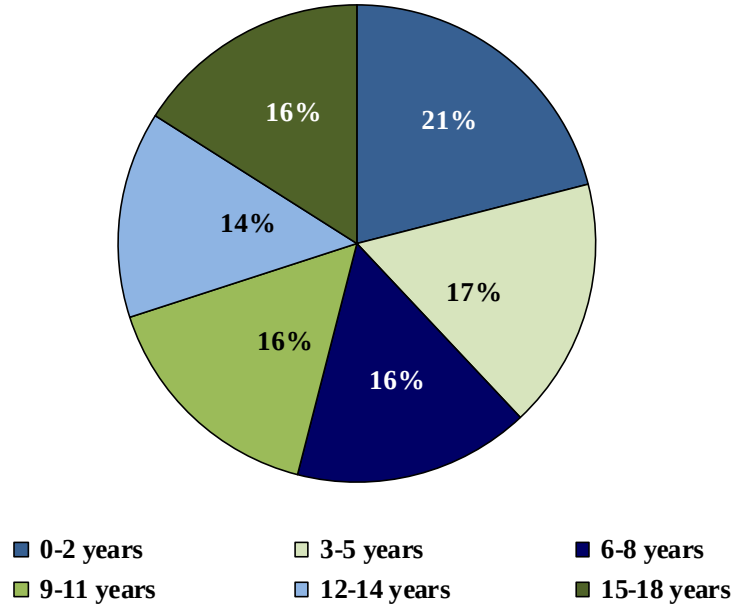


Age of Minor Household Occupants

The average response for all Texas households surveyed who reported having minor occupants in a given age range (n=1486) was approximately 21% for 0-2 years, 17% for 3-5 years, 16% for 6-8 years, 16% for 9-11 years, 14% for 12-14 years, and 16% for 15-18 years.

Figure 16 demonstrates that infants, toddlers, and preschoolers, the most vulnerable, make up a slight majority of in terms of minor household occupants.

Figure 16. Minor Occupants by Age Range — Texas



This trend is consistent across each region individually, with the highest percentages of minors falling into either of the youngest three age ranges, as shown in Figure 19. Region 7 does not follow this trend, with a total of 31% of minor household occupants falling in the youngest two age ranges compared to 40% in the 15-18 age range. This inconsistency is possibly due to Region 7's small sample size.

Figure 17. Minor Occupants Age Range — by Region

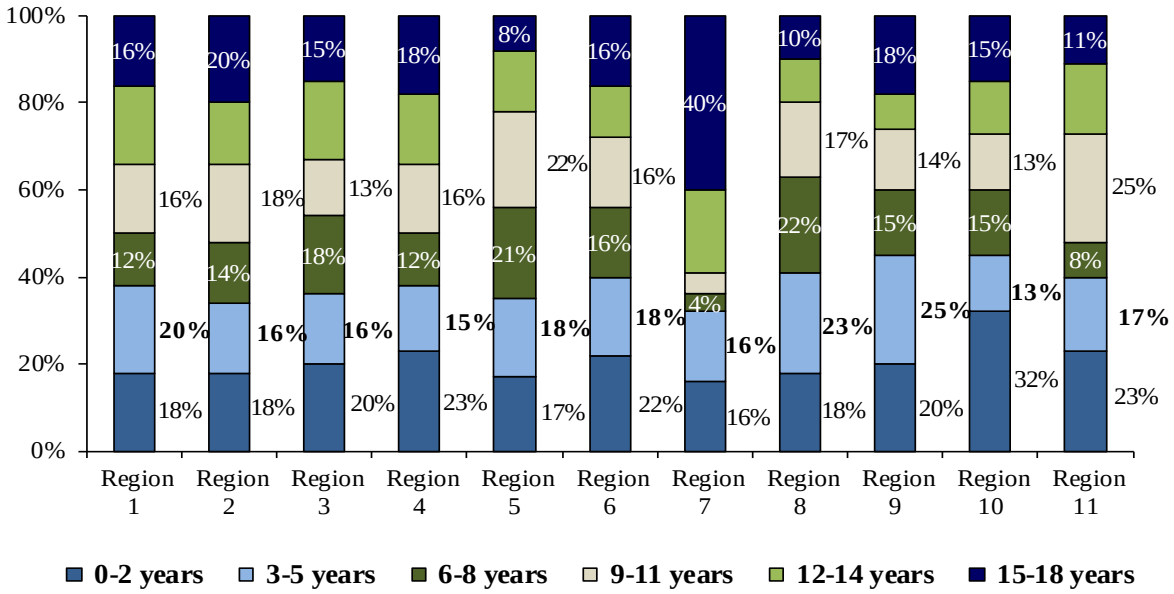


Figure 18. Minor Household Occupants — by Age Range and Selected Region

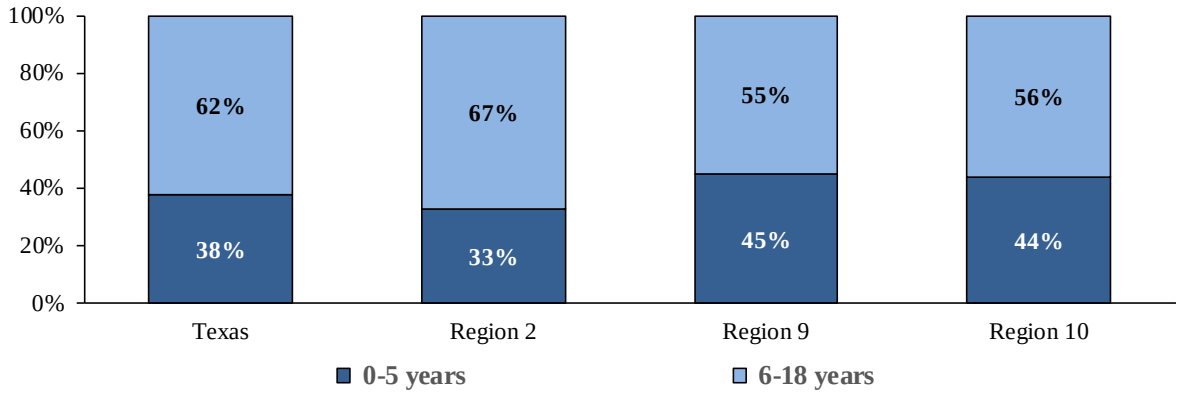


Table 3. Age of Minor Household Occupants — by Region (Simplified)

Region	0-5 years	6-18 years
1-Houston Metropolitan	38%	62%
2-Dallas/Fort-Worth Metroplex	33%	67%
3-San Antonio Area	36%	64%
4-Captial Area	38%	63%
5-West Texas	33%	67%
6-Southwest Texas	40%	60%
7-Corpus Christi Metropolitan	31%	69%
8-East Texas	41%	59%
9-Texas Panhandle	45%	55%
10-West/Central Texas	44%	56%
11-Waco Area	40%	60%

These findings are significant because, as previously mentioned, households with children consistently consume more energy. Furthermore, Baker, Blundell, and Micklewright (1989) reported that, all else being equal, younger children are more sensitive to ambient room temperature and thus require tighter climate control. Therefore, the 38% of Texas households surveyed with minor occupants in the 0-2 and 3-5 years age ranges potentially have an even higher energy burden than households that only have minor occupants in the older age ranges.

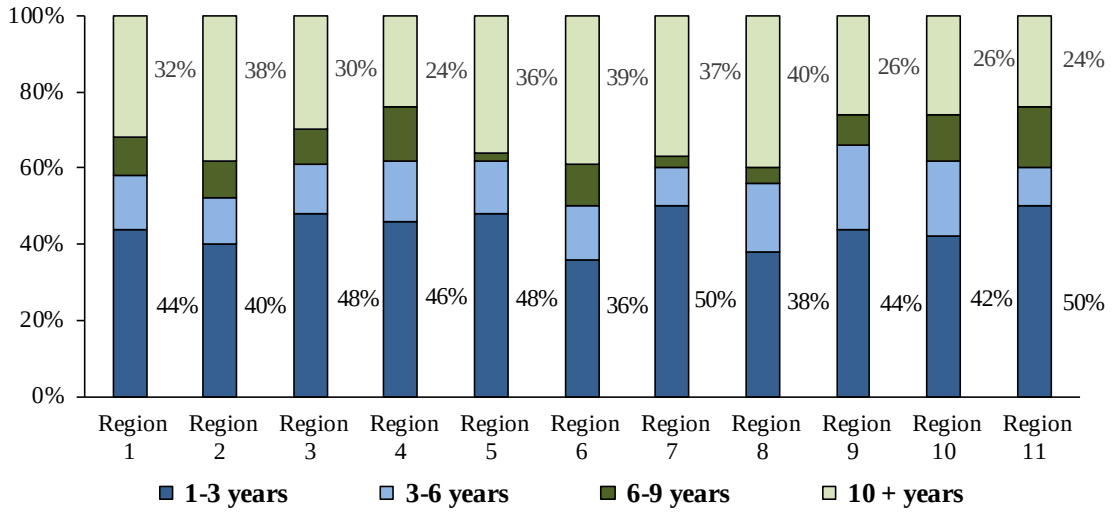
As Figure 20 above shows, the utility companies that serve Regions 9 and 10, in particular, may want to consider prioritizing assisting LMI households with minor occupants because they are more likely to have very young children. Households with young children have been shown to take on more debt as opposed to cutting back on energy consumption since keeping their children comfortable is a priority.[lxvii]

Length of Time Lived at Current Address

The survey sample from across Texas revealed that 43% of respondents have lived in their current home for 1-3 years, 16% for 3-6 years, 10% for 6-9 years, and 31% for 10 years or longer. The majority of respondents reported having lived in their home for 1-3 years, followed by the second largest number of respondents for 10 years or longer. Respondents living in their

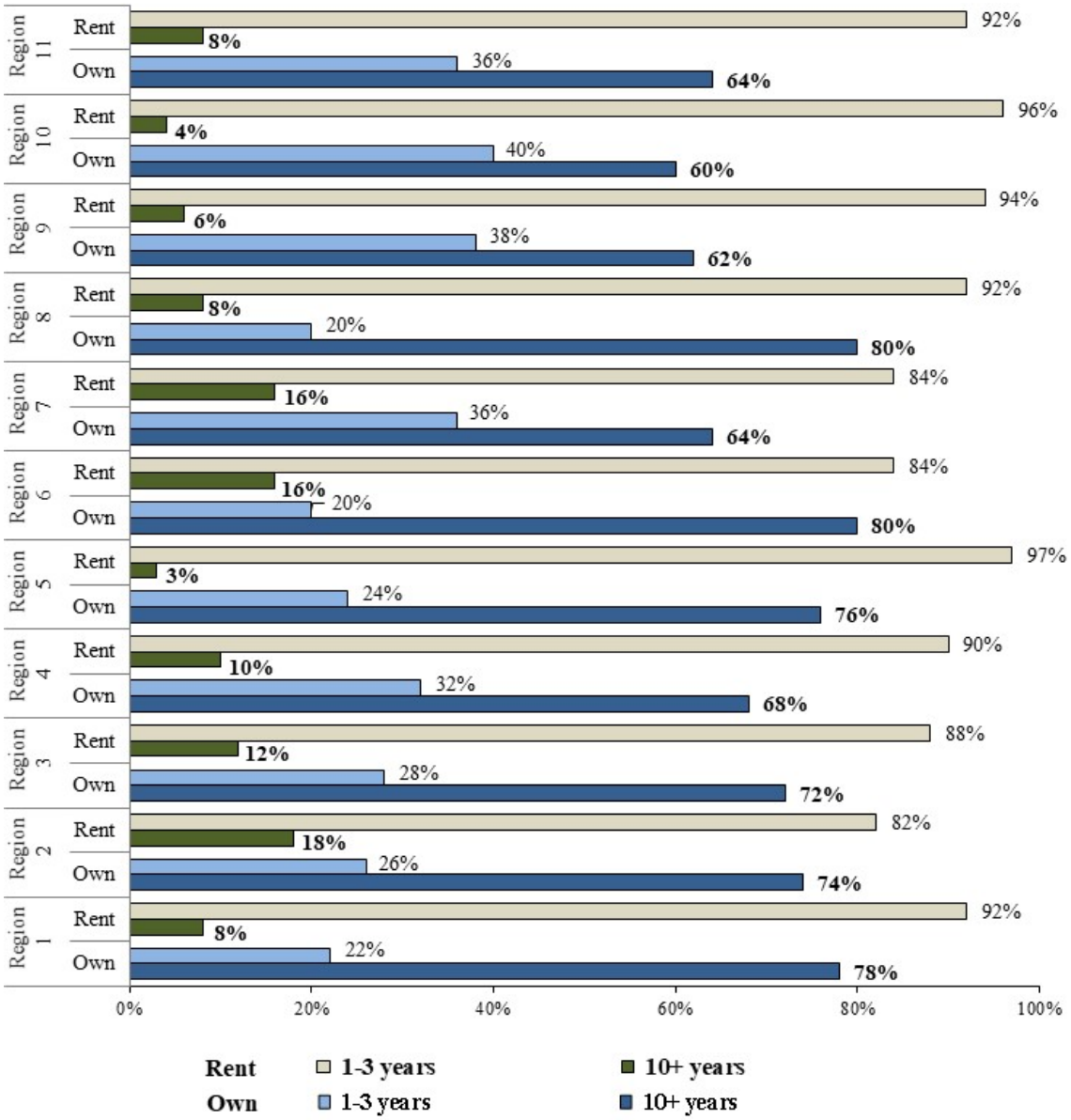
homes for 3-6 years followed, and the least common response was 6-9 years. This is true for all 11 regions, with the exception of Regions 6 and 8 where the majority of respondents lived in their home for 10 years or longer by 2-4 percentage points compared to the number of respondents who lived in their home for 1-3 years. This discrepancy is possibly due to both regions having fewer than 100 respondents for this question.

Figure 19. Length of Residency at Current Address — Texas



The results from this question are relevant because the survey data reveal the majority of respondents who answered 1-3 years are renters, and the majority of respondents who answered 10 years or longer are homeowners (as seen below in Figure 22). It is known from previous studies that homeowners are typically incentivized to consume less energy than renters.

Figure 20. Intersection of Home Ownership and Length of Residency

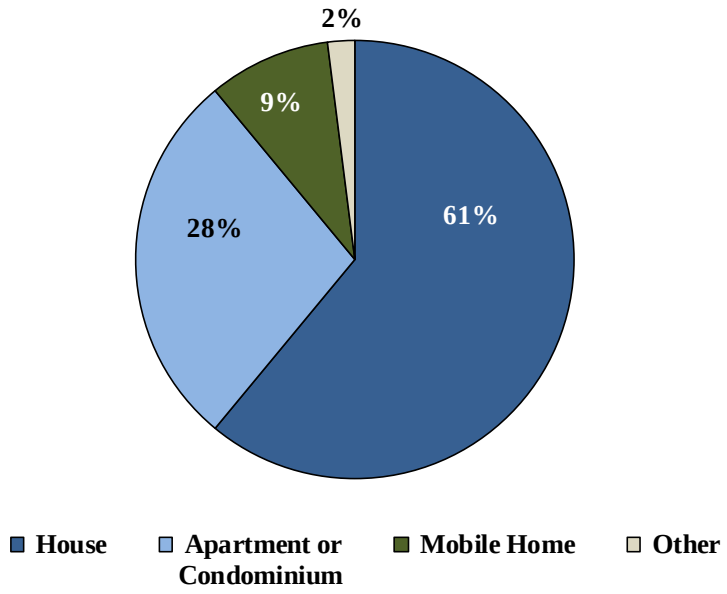


On the other hand, this data may meant that it is difficult for energy stakeholders to provide support to LMI renters because renters are not typically at the same residence long enough for it to be worthwhile for them to spend money on energy efficient measures. Furthermore, the rental property owner does not pay for the utilities and thus is not incentivized to spend money to make energy efficient improvements either (the split incentive issue).

Housing Type

The survey sample from across Texas revealed that the majority of respondents live in a house at 61%; 28% live in an apartment; and 9% live in a mobile home (Figure 21). Only 37 respondents from our entire sample from all regions (n=2020) answered that they live in another type of housing, totaling barely two percent. These proportions remain fairly consistent in each individual region. These findings are significant as the literature indicates that, everything else being equal, people living in houses have the highest energy burden.

Figure 21. Housing Types — Texas



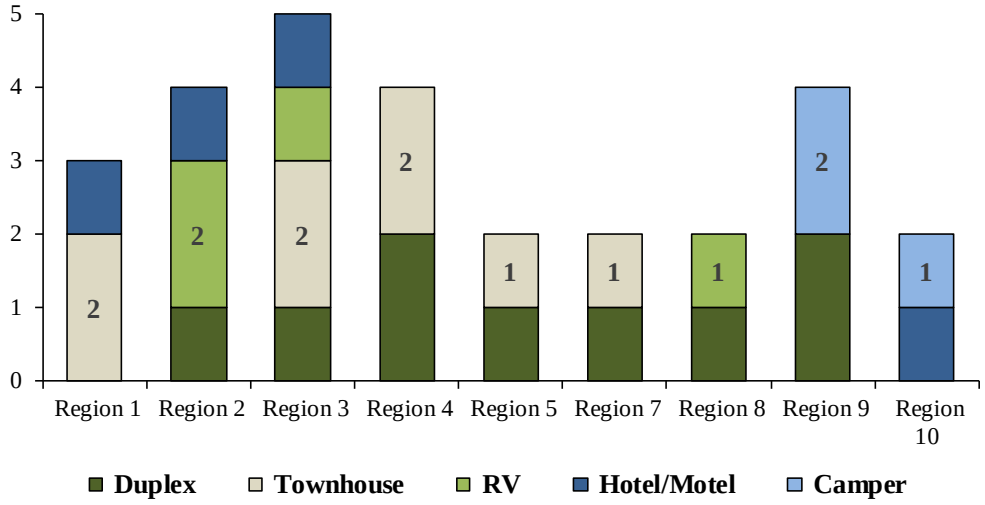
The various types of alternative housing reported are listed in Table 4.

Table 4. Alternative Housing Types — Texas

Alternative Housing Type	Count
1. Duplex	9
2. Townhouse	8
3. Hotel/Motel	4
4. RV	4
5. Camper	3
6. Building	1
7. Class A Motorhome	1
8. Family	1
9. Fourplex	1
10. Garage	1
11. Guest House	1
12. Nursing Home	1
13. Tiny House	1
14. Trailer Home	1
Total	**37**

For an individual region, Region 3 had the most respondents reporting in living in alternative housing at a count of eight. No respondents at all from Regions 6 and 11 reported living in alternative housing, possibly due to the already small sample sizes in those regions. The alternative housing types that received more than one response included duplexes, RVs, campers, townhouses, and hotels. The distribution of these answers across the nine regions they were found in can be seen in 24.

Figure 22. Common Alternative Housing Types — Texas



Region 3 also had the largest number of respondents to report living in the most common alternative housing types at a total count of 5, with 2 living in townhouses, 1 in a duplex, 1 in an RV, and 1 in a hotel. Due to the small individual region samples, there was little time spent analyzing the alternative housing segment individually for each region. This is an area that could be explored more in-depth by future studies.

Owning vs. Renting

The survey sample from all across Texas revealed that approximately 50% of respondents own their home, 47% rent their home, and 3% have some other sort of living arrangement. The majority of that 3% reported that they live with relatives or friends rent-free. As seen Figure , the trend of slightly more than 50% of respondents owning their home and slightly less than 50% renting remains fairly accurate for each region individually, except for Regions 3, 4, and 11 where the reverse is true. Region 11's inconsistency is likely due to the small sample size. Regions 3 and 4 both have sample sizes over 200 for this question, with a difference of 17 and 23 more renters than owners in each region respectively.

Figure 23. Home Ownership — Texas

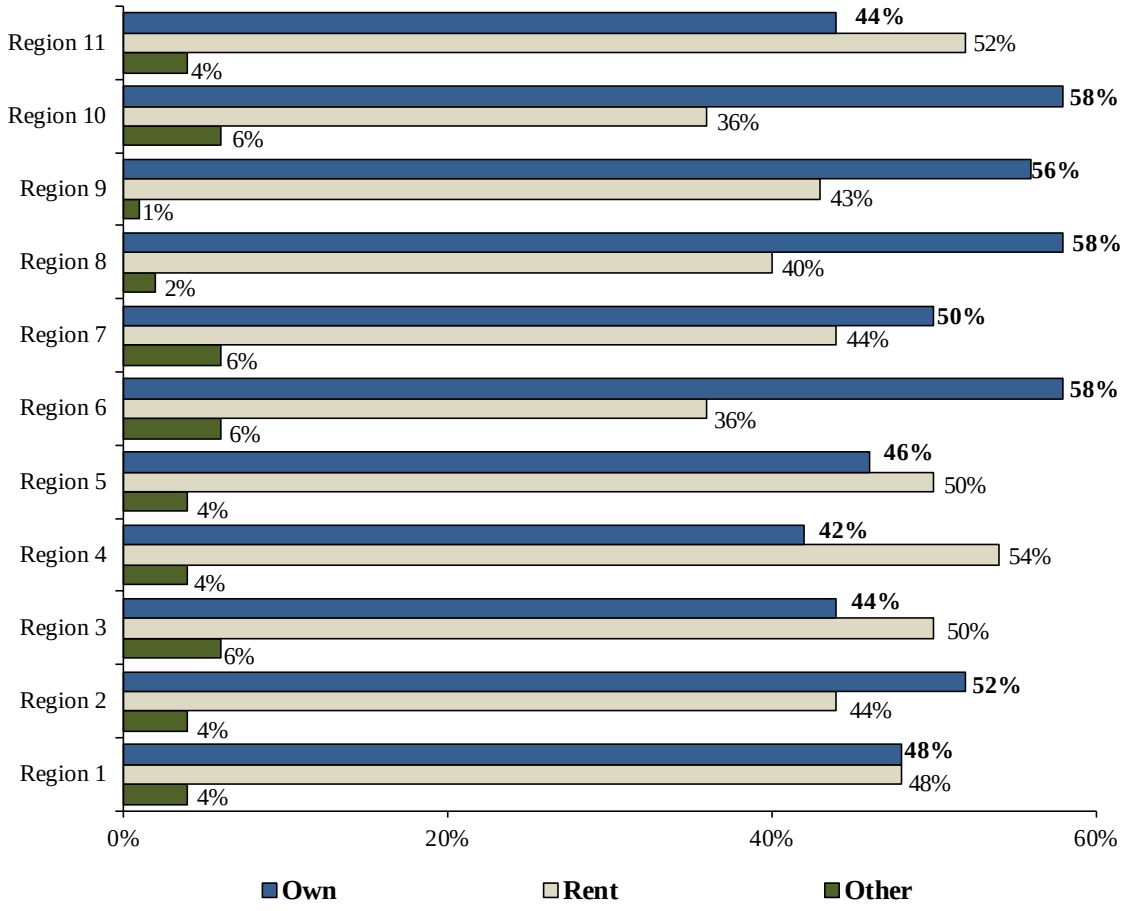
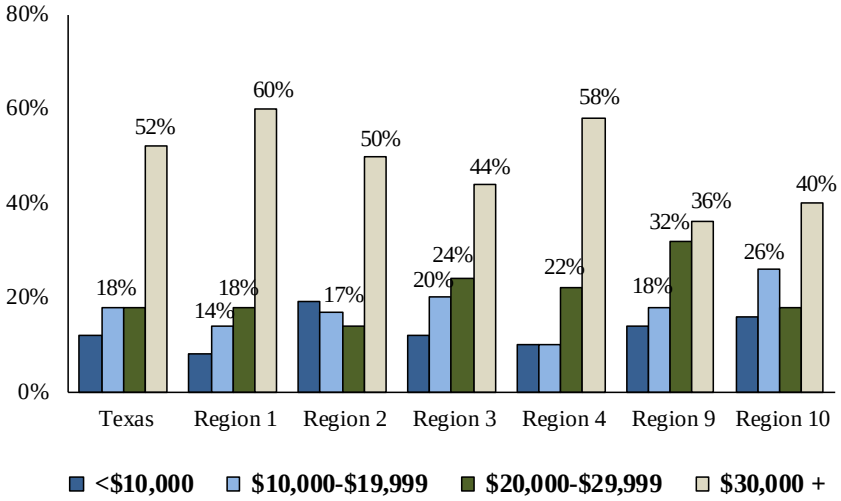
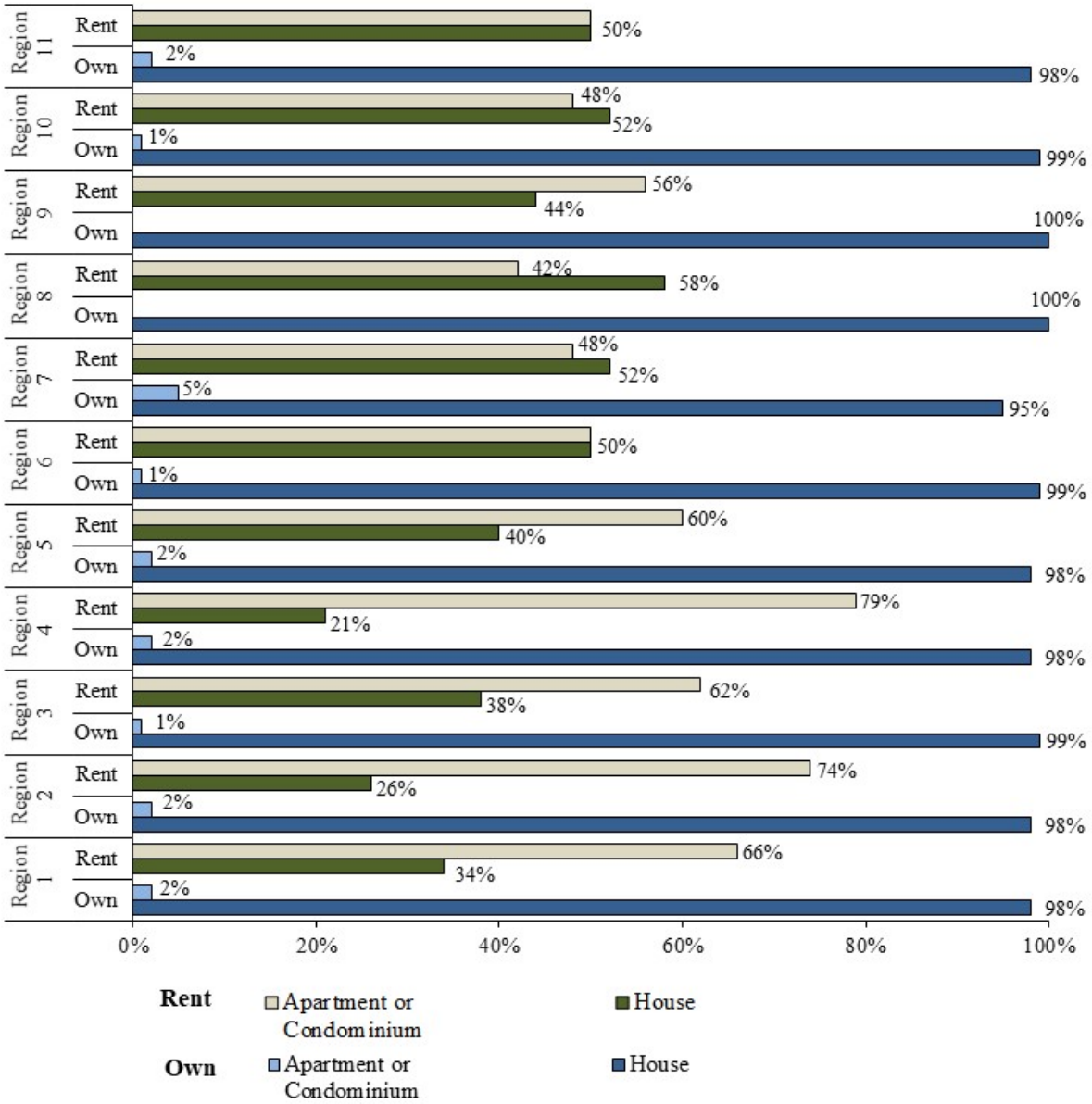


Figure 24. Percentage of Renters — by Income level



As previously mentioned in reference to Figure 24**,** this finding is relevant because previous studies have found that, all else being equal, homeowners are incentivized to consume less energy than renters. And providing support to LMI renters can be difficult because the property owner does not pay for the utilities and is thus not incentivized to spend money to make energy efficient improvements. Furthermore, Figure 25 shows a correlation in our study data between home ownership and traditional single-family housing.

Figure 25. Intersection of Home Ownership and Housing Type

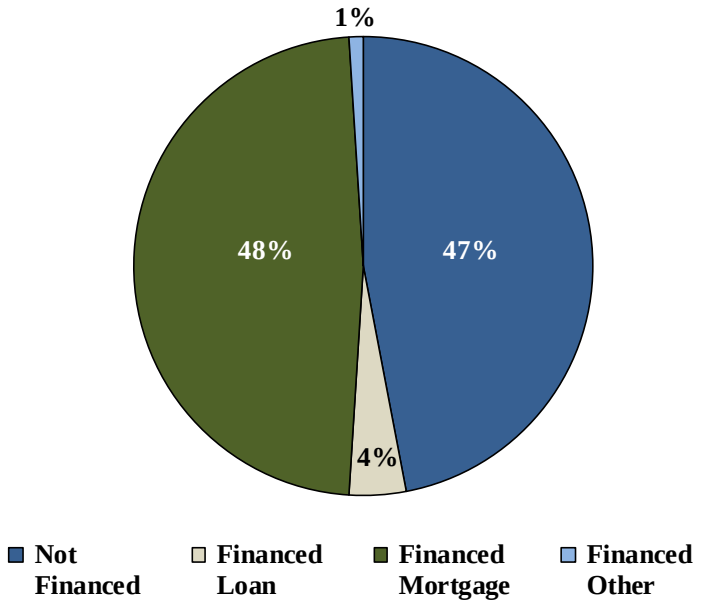


This is also significant because detached, single-family homes generally consume more energy than multi-unit homes. In other words, all else being equal, Texas homeowners are more likely to have a higher energy burden than renters who likely live in an apartment or condominium, and LMI homeowners are also more incentivized than renters to make energy efficient changes. As such, energy industry stakeholders may want to consider starting with homeowners when approaching LMI households, according to regional differences, in particular those living in single-family homes, to encourage them to adopt new energy efficient technologies.

Financing

Out of the survey respondents from across Texas who answered that they own their home (n=1013), 47% said that their home is not financed and 53% said that their home is financed. The vast majority of that 53% reported that their home is financed using a mortgage, as shown in Figure 26.

Figure 26. Home Financing — Texas



From the 53% that reportedly have their home financed (a total of 532 respondents from the entire Texas sample), 92% did so using a mortgage, 8% using a loan, and 1% by using other means.

Figure 27. Types of Home Financing — Texas

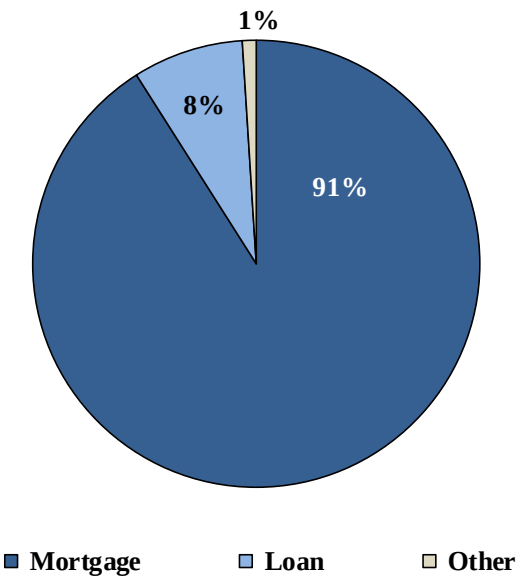
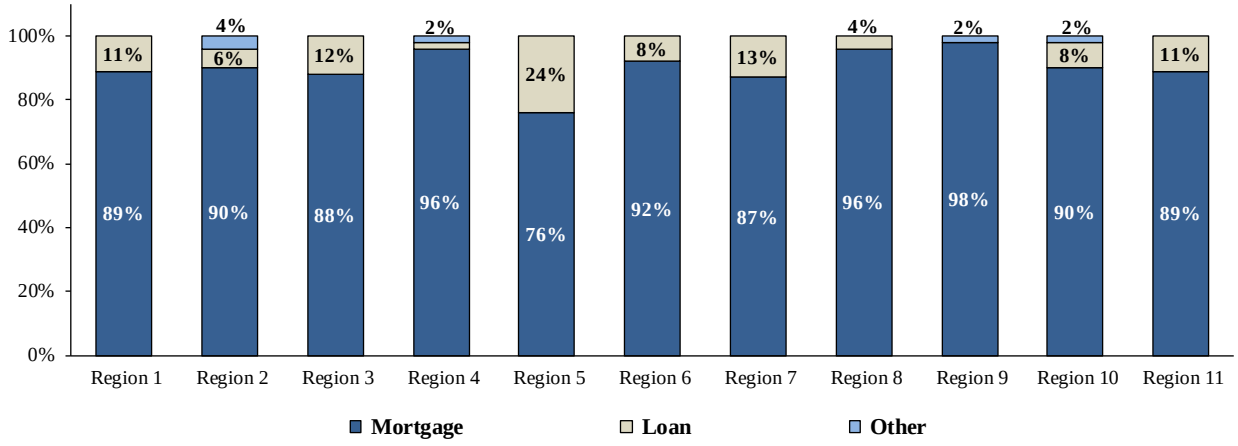


Figure 28 depicts how these proportions remain fairly consistent for each individual region, as well.

Figure 28. Types of Home Financing — by Region



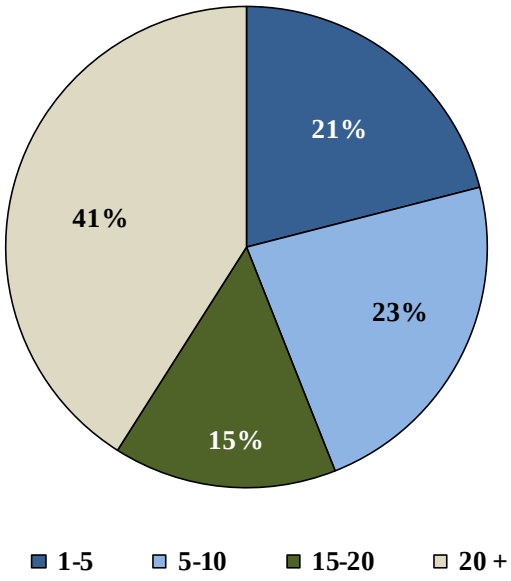
More significant than how the home is financed is the finding that a majority of Texas homeowners surveyed still make payments on their home. As discovered by Adams and West (2006), one of the strategies LMI households use to cope with their financial constraints is to make tradeoffs between paying for bills they view as more rigid than variable, such as rent. It

follows that LMI owners of financed homes would also make financial tradeoffs, such as prioritizing making a house payment over paying an energy bill, as the former could potentially result in defaulting on their mortgage.

Total Units in Apartment Building

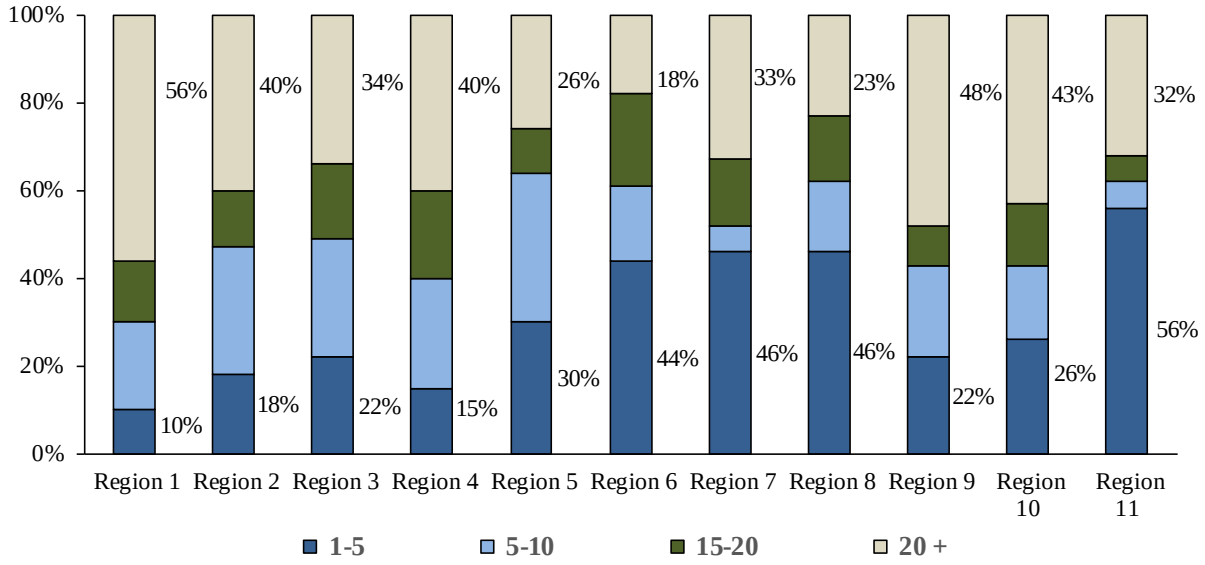
The question of how many total apartment units are in the respondent's building did not apply to 72% of the respondents from our entire Texas sample. The following percentages were calculated from the 572 respondents to which the question did apply. The survey sample from all across Texas revealed that 41% of respondents who live in an apartment live in a building with more than 20 units, 14% live in a building with 15-20 units, 23% live in a building with 5-10 units, and 21% live in a building with 1-5 units.

Figure 29. Total Units in Apartment Building — Texas



This statistic is significant because, as reported by Druckman and Jackson, energy efficiency in multi-family housing affects more households, but renters and landlords have less incentive to make the necessary energy efficient changes that could lower renters' utility bills.

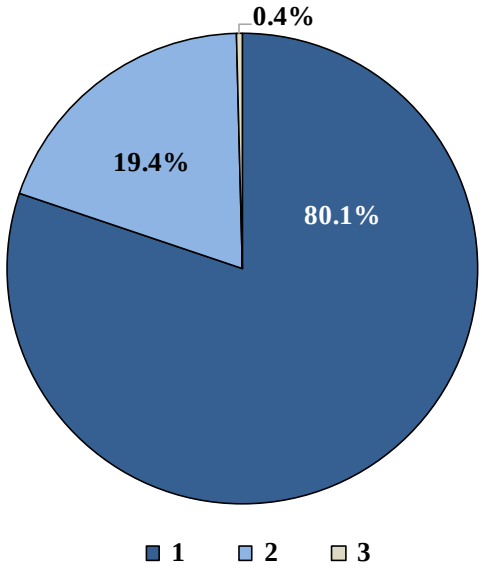
Figure 30. Total Units in Apartment Building — by Region



Number of Stories

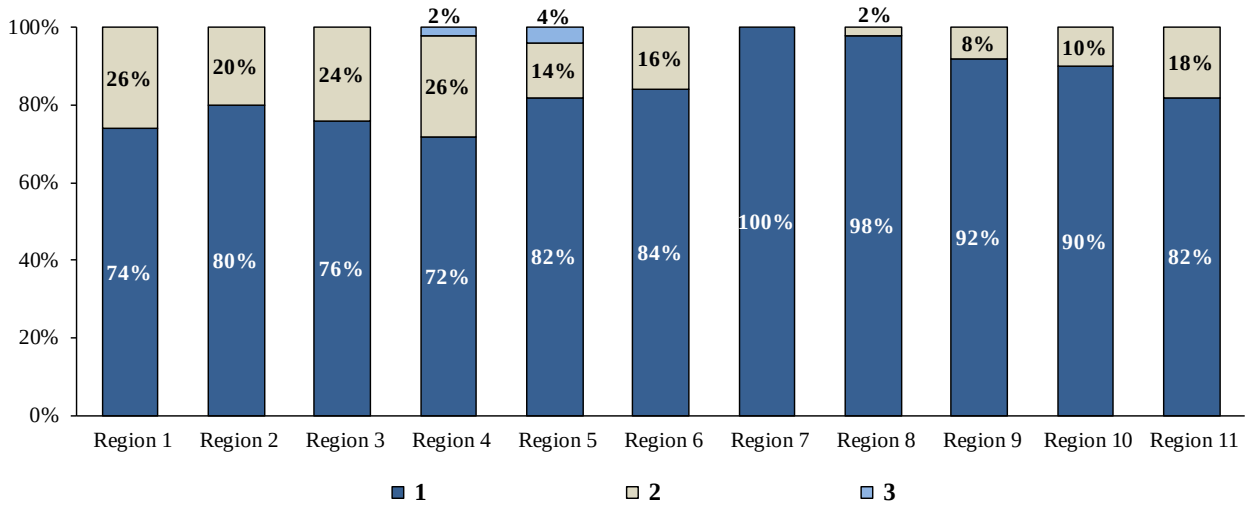
The survey sample from the entire state of Texas revealed that 80% of respondents live in a one-story house, nearly 20% live in a two-story house, and less than half of one percent live in a three-story house.

Figure 31. Number of Stories in Homes — Texas



It is true for all 11 regions that the majority, if not all, of the respondents live in a one-story house, as shown in Figure 32.

Figure 32. Number of Stories in a Home — by Region

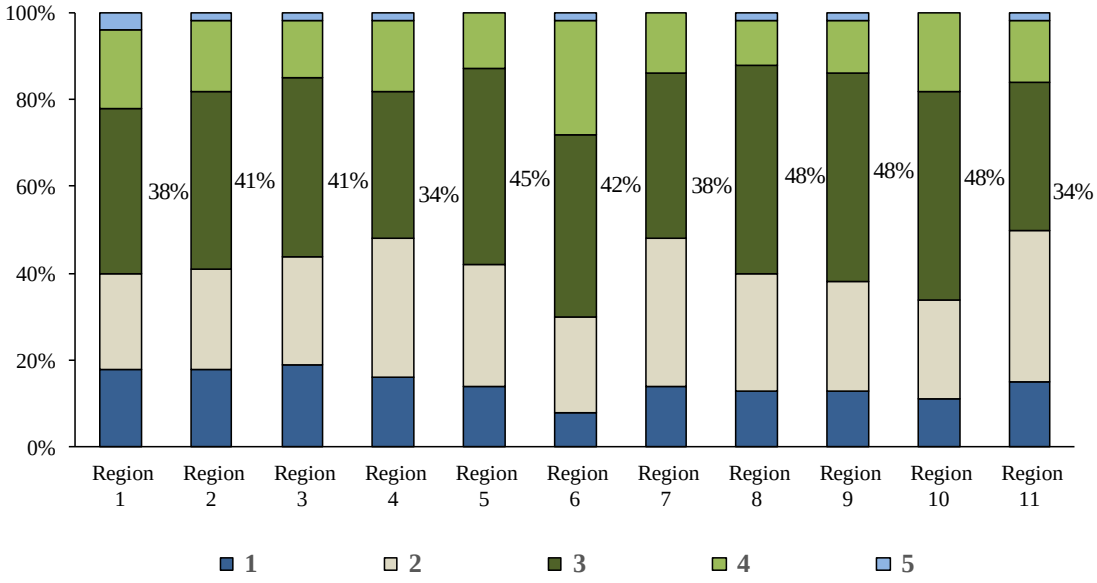


This is significant because Druckman and Jackson also found that single-family units consume more energy than multi-family units of the same size.

Number of Bedrooms

The survey sample from the entire state of Texas revealed that 16% have 1 bedroom in their home, 26% have 2 bedrooms in their home, 41% of respondents have 3 bedrooms in their home, 16% have 4 bedrooms in their home, and 2% have 5 bedrooms in their home. This is significant in that previous research by Baker, Blundell, and Micklewright (1989) has suggested that there is a positive correlation between the number of bedrooms in a home and energy consumption, all other factors held equal, because the number of bedrooms functions as another measure of household size and occupancy. As seen in Figure 35, these proportions remain fairly consistent across each region in the state of Texas, as well.

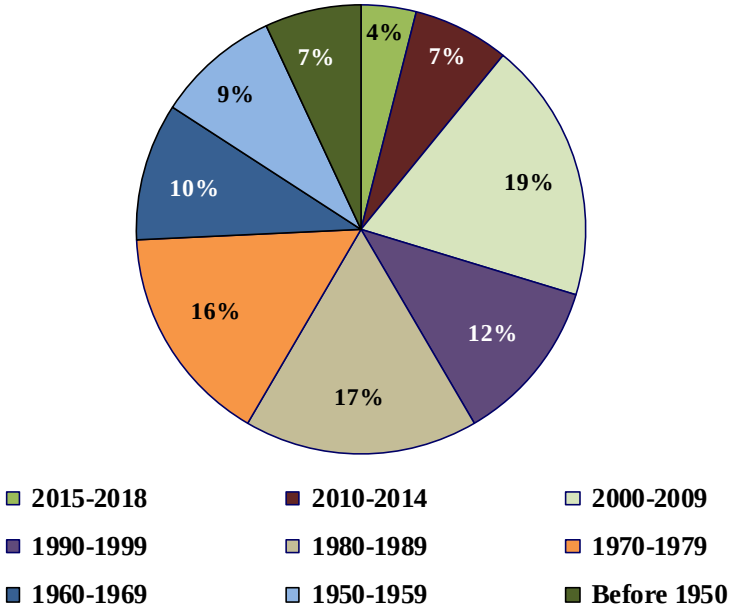
Figure 33. Number of Bedrooms in Home



Age of Home

The survey sample from the entire state revealed that 16% of respondents' homes were built between 2000-2009, which was the most commonly chosen response. The majority of respondents overall, 61%, reported that their home was built before the year 2000, 26% said it was built in the year 2000 or later, and 13% of respondents were not sure approximately when their home was built. If the respondents who did not know when their home was built were excluded, the new percentages are shown below in Figure 34, with a total of 70% of homes built prior to the year 2000 and 30% built in the year 2000 or later.

Figure 34. Age of Home in Texas



These findings are significant because Steemers and Yun confirmed that older structures are less energy efficient and could greatly benefit from weatherization and insulation programs, all other factors held equal.

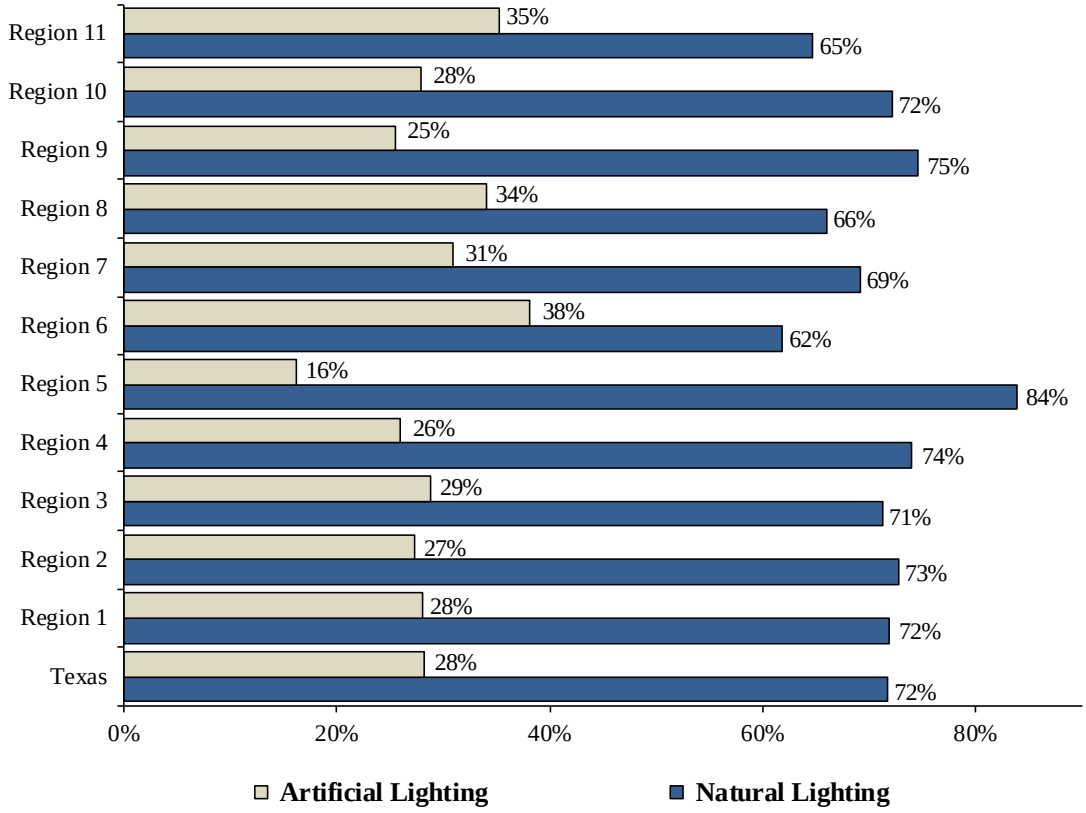
3.2.3 Energy Efficiency

State legislation requires that energy companies have to spend ten percent of their energy efficiency budget on providing energy efficiency measures to their low-income customers.[lxviii] Therefore, researchers asked survey respondents questions related to the energy efficiency in their home to determine the area(s) most in need of improvement. In this survey, energy efficiency is gauged by asking questions regarding the age and type of appliances people have in their homes, the temperature and how comfortable they are in their homes, the nature of their homes, and how often they are in their homes. The point of these questions is to gauge their energy consumption and to understand the factors that may affect their comfort and energy efficiency.

Lighting

Statewide, 71% of all low-income Texans surveyed rely primarily on natural lighting from windows, while 29% rely primarily on artificial lighting from lamps and light fixtures.

Figure 35. Home Lighting Sources



Switching to more energy efficient light bulbs are a lower cost way to reduce energy costs. Incandescent light bulbs are the least energy efficient, CFL light bulbs are more energy efficient, and LED lights are the most energy efficient. The comparison for these light bulbs are measured in how long the bulb lasts and how much energy it draws versus how much light is emitted.

The United States Energy Department provided the following insights:[lxix]

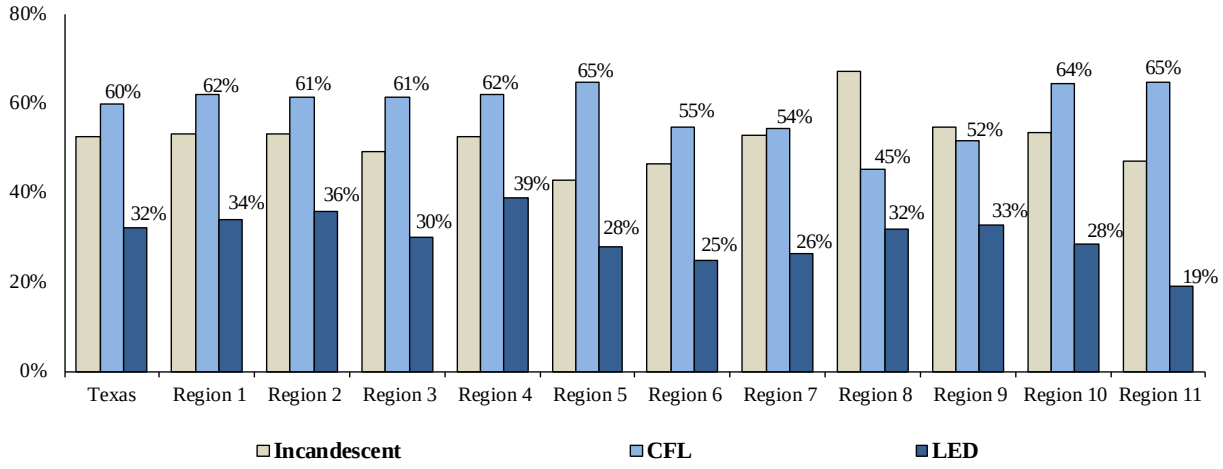
- "An ENERGY STAR-qualified CFL uses about one-fourth the energy and lasts ten times longer than a comparable traditional incandescent bulb that puts out the same amount of light. A typical CFL can pay for itself in energy savings in less than 9

months and continue to save you money each month. A CFL uses about one-third the energy of a halogen incandescent."

- "ENERGY STAR-qualified LEDs use only 20%–25% of the energy and last up to 25 times longer than the traditional incandescent bulbs they replace. LEDs use 25%–30% of the energy and last 8 to 25 times longer than halogen incandescent."
- "CFL lights are moderately priced, LED lights are more expensive however they last longer. An average household dedicates about 5% of its energy budget to lighting."

Survey respondents were asked to identify which kind of light bulbs were used in their home, and they were able to select more than one type. The findings show that 52% said they used incandescent light bulbs, 60% said they used CFL light bulbs, and 32% reported using LED light bulbs.

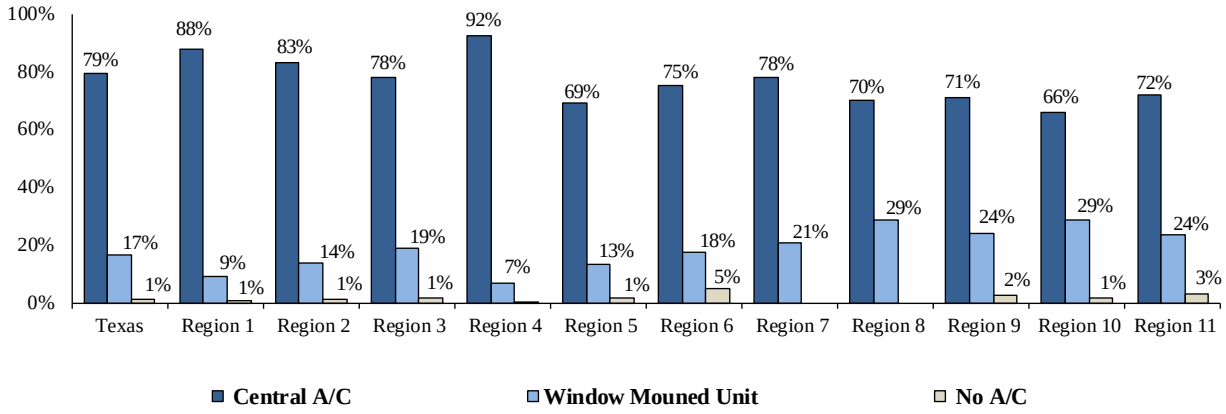
Figure 36. Energy Efficiency: Light Bulb Usages



Appliances

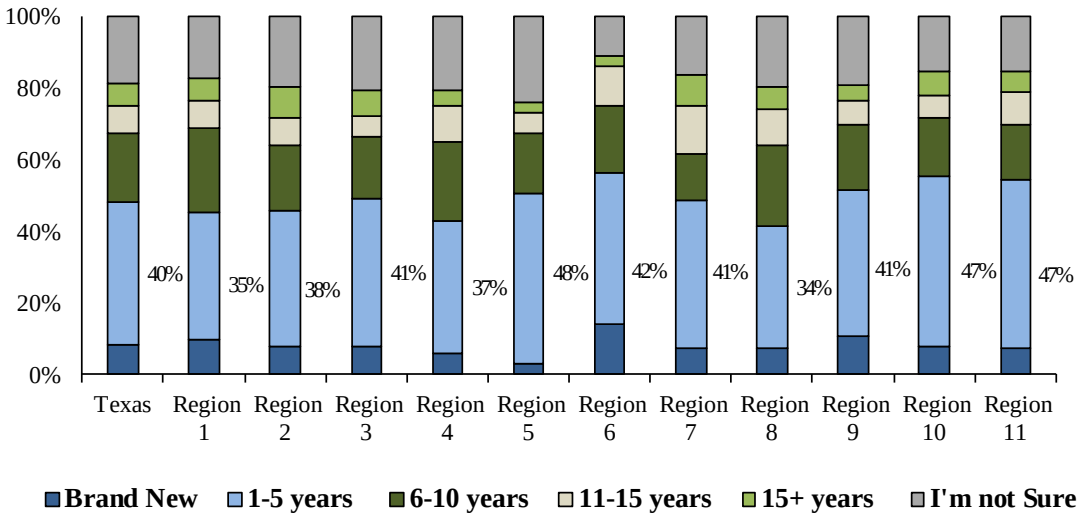
Eighty percent of those surveyed have central air conditioners in their homes, while seventeen percent have window-mounted air conditioners. Two percent report having a different type of air conditioning system, while one percent of low-income Texans surveyed do not have an air conditioner.

Figure 37. Air Conditioner Type



For those who reported having an air conditioner in the home, roughly 40% of survey respondents reported having an air conditioning system between 1 – 5 years old, 19% reported that their air conditioner was between 6 – 10 years old, and 18% were not sure of the age.

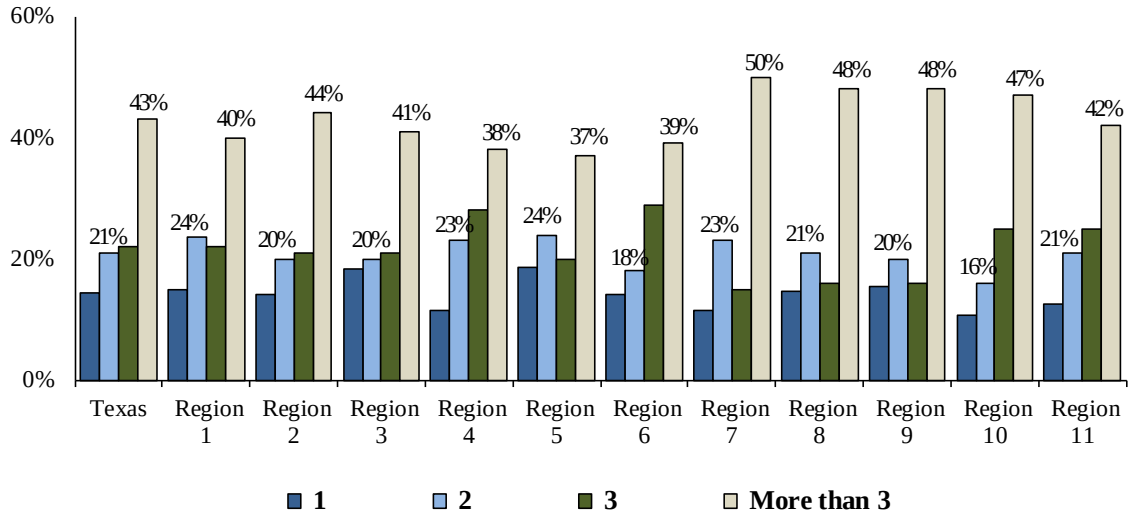
Figure 38. Age of Air Conditioner



Ceiling fans are a more efficient at cooling a room than running the air conditioner for the entire home. The following are the reported number of rooms with a ceiling fan in the home from all regions. Of those who responded, 43% said they had a ceiling fan in more than 3 rooms of

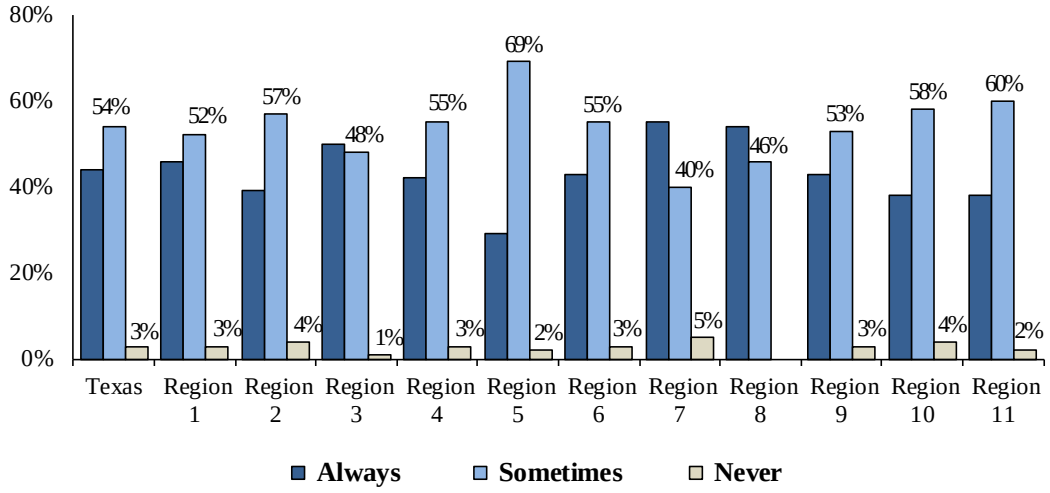
their home, 22% said only 3 rooms had ceiling fans, 21% said only 2 rooms had ceiling fans, and 14% said only had 1 room had a ceiling fan.

Figure 39. Number of Ceiling Fans in the Home



With regards to frequency of use, 44% of respondents said they use the ceiling fan often, 54% of respondents said they use the ceiling fan sometimes, and 3% said they never used the ceiling fan.

Figure 40. How Often Ceiling Fan is Used



Studies show that the energy efficiency of large home appliances significantly affects the size of energy bills. Table 5 displays a list of the 13 appliances that use the most energy in the home. Survey respondents were asked to select the number of these appliances that were in their home.

Table 5. Home Appliances

Appliance in home	Count	Percentage
1. Refrigerator	1985	98
2. Television	1932	96
3. Microwave	1890	94
4. Ceiling Fan	1689	84
5. Water Heater	1681	83
6. Washer	1633	81
7. Dryer	1608	80
8. Laptop	1435	71
9. Dishwasher	1346	67
10. Electric Stove	1341	66
11. Desktop Computer	931	46
12. Gas Stove	650	32
13. Landline Telephone	629	31

For respondents statewide, 10% of respondents reported that their refrigerator was less than 1 year old, while 40% reported that their refrigerator was between 1 – 5 years old, 22% reported their refrigerator was between 5 – 10 years old, 9% report it being between 10 – 15 years old, 4% said their refrigerator was more the 15 years old, and 15% were not sure of the age of their refrigerator. This means that roughly 50% of all respondents have a refrigerator less than 5 years old, which means only half of the population of respondents are confident they are utilizing the most energy efficient appliances related to age of the appliance.

Table 6. Age of Refrigerator

Refrigerator	Count	Percentage
Less than 1 year old	190	10%
1 - 5 years	804	40%
5 - 10 years	431	22%
10 - 15 years	174	9%
15 years or more	89	4%
I'm not sure	297	15%
Grand Total	**1985**	**100%**

**Note: Question 29 asked about the age of the refrigerator in the home. However the non-responses were too high to extract meaningful information from this question on a general reporting level. Below are the "I'm not sure" and Non-response rates for the sample which influenced our decision to eliminate the question from the report. Below this chart are some suggestions on how to salvage this data -- I appreciate your feedback.

Table 7. How Old is Your Refrigerator

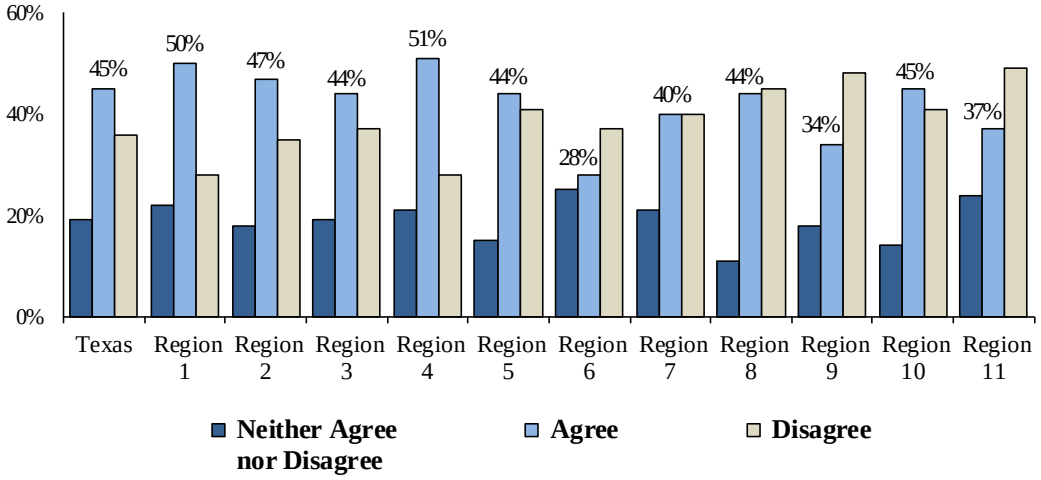
	I'm Not Sure	No Response	Combined	Sample
1-Houston Metropolitan	14%	2%	16%	385
2-Dallas/Fort-Worth Metroplex	18%	3%	21%	385
3-San Antonio Area	13%		14%	271
4-Captial Area	17%	1%	18%	208
5-West Texas	13%	1%	15%	68
6-Southwest Texas	11%	2%	13%	97
7-Corpus Christi Metropolitan	15%	3%	18%	68
8-East Texas	14%	0%	14%	97
9-Texas Panhandle	15%	1%	16%	165
10-West/Central Texas	10%	1%	11%	208
11-Waco Area	22%	1%	24%	68
Texas	15%	2%	16%	2,020

Perceptions on Insulation

Of the respondents, 26% reported having large cracks or open spaces in the home (Question 30). Large cracks and open spaces make the home less energy efficient since the air conditioner will have to run longer to compensate for open spaces.

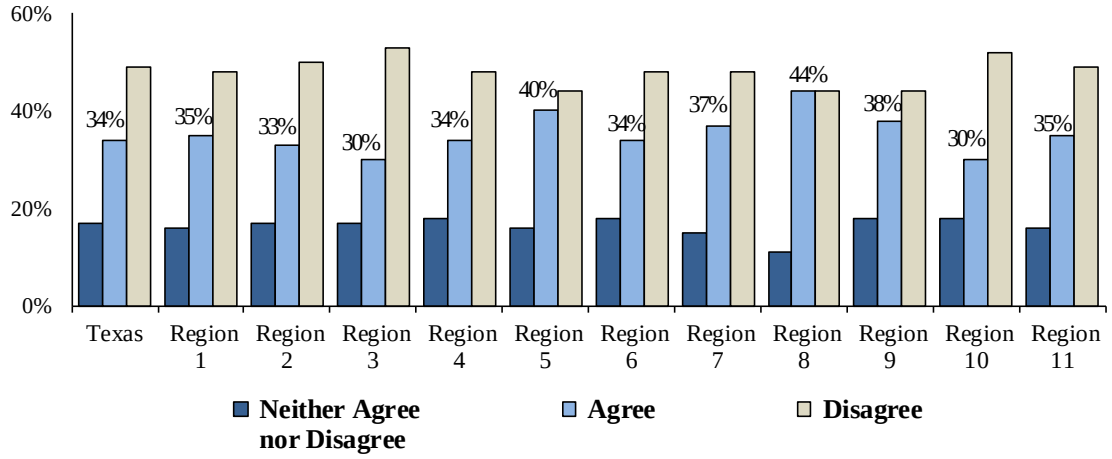
Forty-five percent of respondents agreed (somewhat or strongly agree were combined here) with the statement “My house is not drafty at all.” Thirty-six percent disagreed (somewhat or strongly) with the statement, and nineteen percent had no opinion either way. That means roughly thirty-six percent believe their homes are drafty, which affects energy use and the overall energy efficiency of the home.

Figure 41. Home is Not Drafty at All



Forty-nine percent of respondents disagreed with the statement "It is hard to keep my house at a comfortable temperature" or that they believe it is easy to keep their house at a comfortable temperature. Thirty-four percent agreed with the statement, meaning it is hard to keep their home a comfortable temperature. Of the respondents, seventeen percent reported neither agreeing with nor disagreeing with the statement.

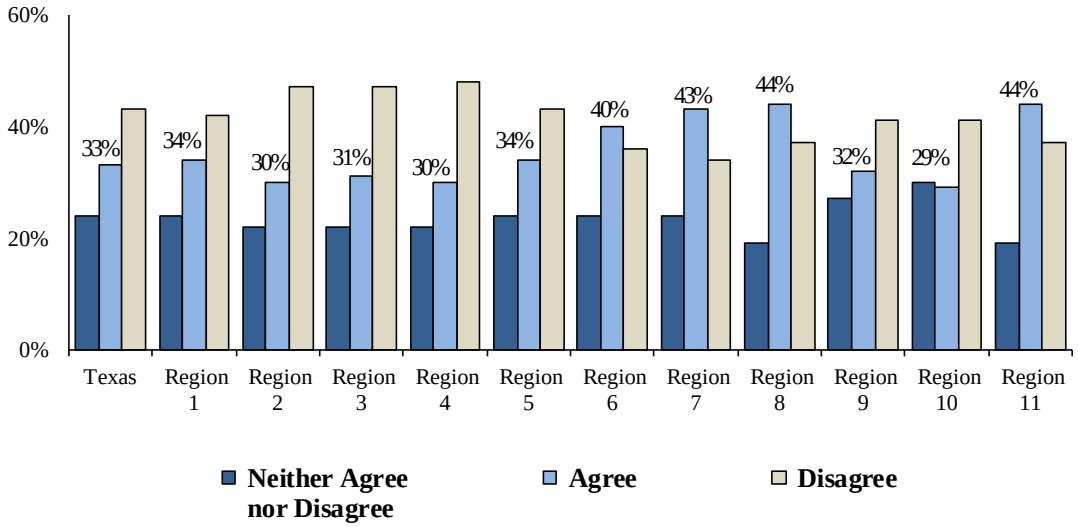
Figure 42. Hard to Keep Home at Comfortable Temperature



Forty-three percent of respondents disagree with the statement that "Disagreement over the temperature indoors is common in my house." Thirty-three percent of respondents agreed

that there is disagreement over the temperature indoors in their home, while twenty-four percent said they neither agree nor disagree with the statement.***

Figure 43. Disagreement over the Temperature Indoors is Common



***Note: Question 31 asks about perceptions of draftiness and insulation of the home. Researchers assumed that many people in apartment complexes wouldn't know about the insulation of their homes so this question was included. The data reports that the majority of respondents report that their homes are not drafty, not hard to keep a comfortable temperature, and that disagreement over the home temperature is not common. There is also a high rate of the "neither agree nor disagree" choice which ultimately would increase the "nonresponse rate". Most regions also report similar findings, except for Regions 6,7, 8, 9 and 11. This question is included in regions where there were interesting findings.

Temperature and Comfort

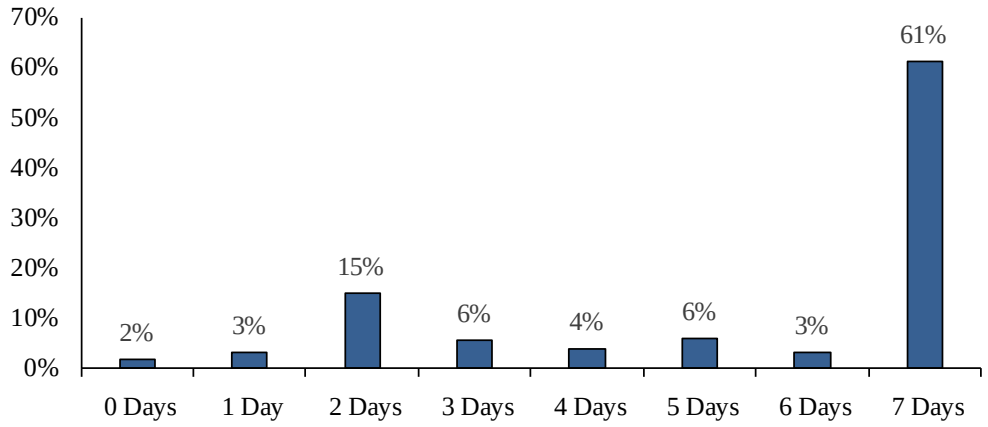
Researchers asked respondents about how their house felt in summer and winter because this can help gauge the energy efficiency of a house, possible factors for temperature related health concerns, and the cost of keeping the house at a comfortable level. Statewide, 53% of surveyed people reported being comfortable in their house during the summer, while 27% said they were moderately warm, 15% said they were hot, and about 5% said they were cold or moderately cold. In the winter, 49% of Texans surveyed reported being comfortable, with 28% being moderately cold, 10% being cold, and 12% being moderately warm. While fewer people report being comfortable in the winter, our sample seems to experience more extreme temperatures in their homes in the summer.

When broken down by energy poverty, respondents in energy poverty have much harder times keeping their homes comfortable. In both summer and winter, people in energy poverty have lower levels of comfort in their home, meaning they are paying a significant amount for energy but are not able to keep their home at a proper temperature.

Time Spent at Home

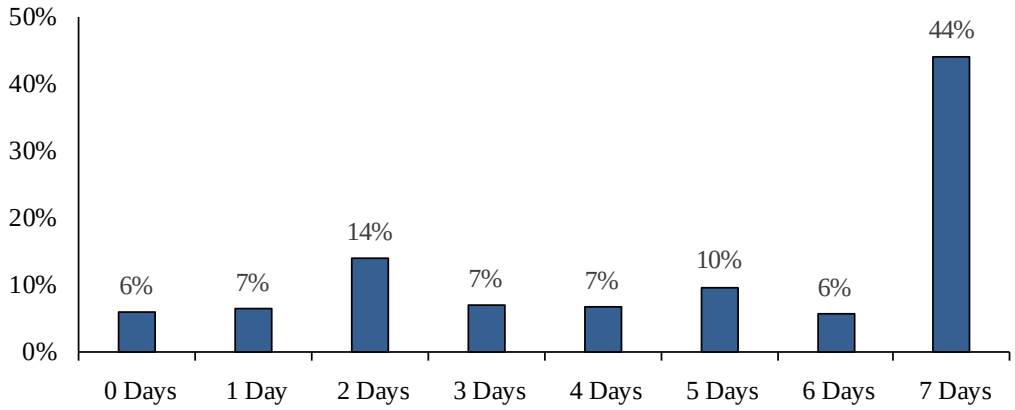
Time spent at home is an important variable to consider, as people spending a significant amount of time in one's house will likely result in higher energy bills. In Texas, 60.9% of our surveyed population are home for at least part of the day 7 days a week. When broken down by respondents in energy poverty, 50% of people in energy poverty are home all day all week compared to 42% who are not in energy poverty. This points to a correlation between staying home and using more energy, thus having higher energy bills.

Figure 44. Time Spent at Home for Part of the Day — Texas



While 61% of our sample reported being at home all day seven days a week, the next highest concentration of people were those who reported staying home all day for 2 days a week at 15%. Rates of energy poverty remain about the same across the days of the week, with the lowest rates of energy poverty reported by people who are never home or only home one full day. People who were home all day all week did not experience higher rates of energy poverty.

Figure 45. Full Days Spent at Home — Statewide

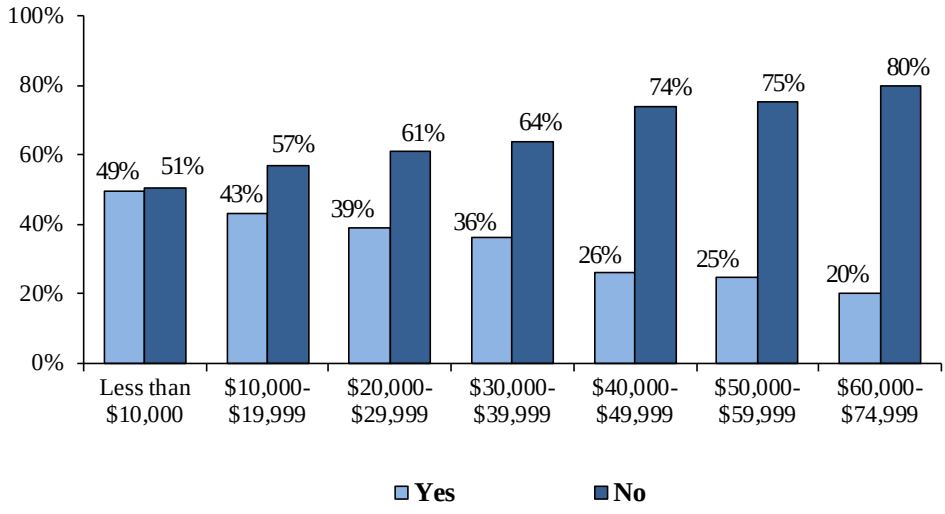


3.2.4 Financial Situation

Table 8. Average Seasonal Electric Bill — Texas

Average Monthly Electricity Bill	State of Texas
Winter	$146.30
Spring	$123.08
Summer	$169.61
Fall	$125.31

Figure 46. Income versus Trouble Paying Electric Bill — Texas

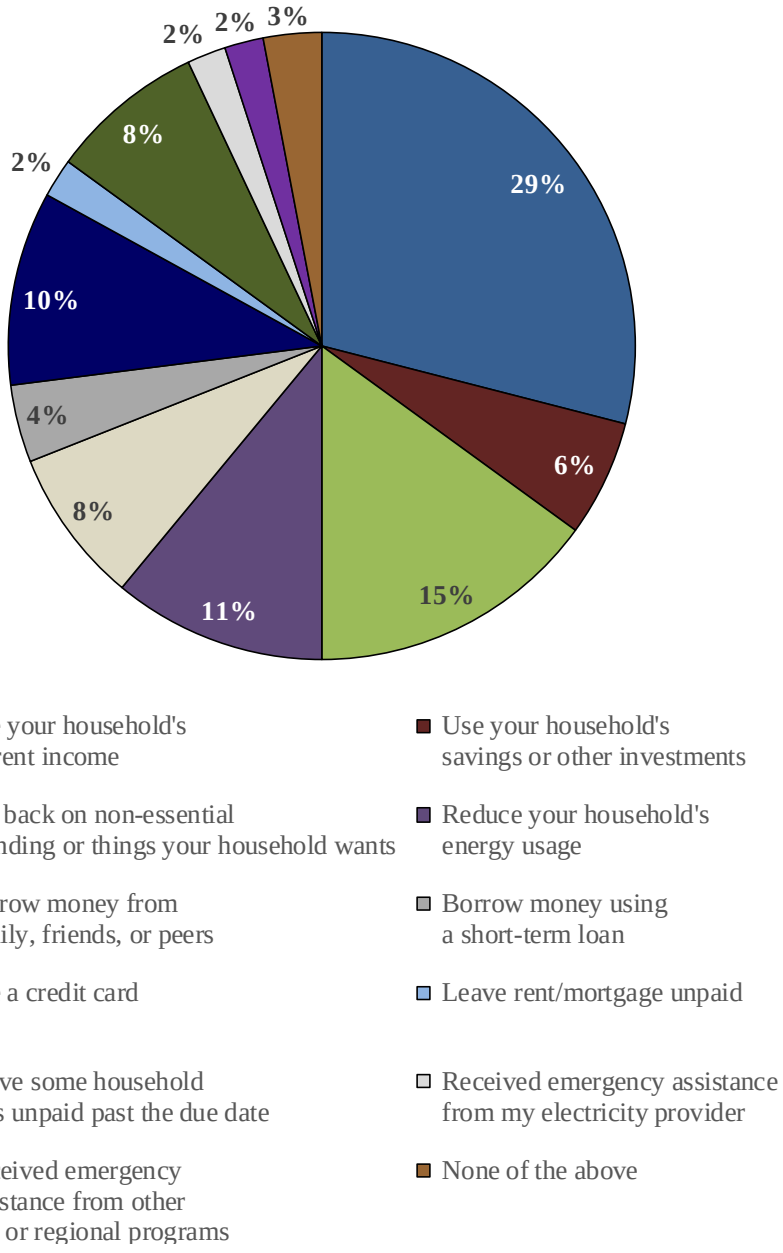


Other Economic and Social Hardships

Experienced Hardships	Count of Survey Respondents	State of Texas Percentage of Survey Respondents
Lost a job or became unemployed	431	26%
Work hours or pay reduced	323	20%
Received foreclosure or eviction notice	40	3%
Divorce or separation from their spouse/domestic partner	81	5%
Death of a household member	93	6%
Had a baby	122	8%
Cared for an elderly or disabled household member	136	8%
Became disabled or seriously ill	140	8%
Natural disaster	253	16%
Total	**1,619**	**100%**

Bill Paying Options

Figure 47. Bill Paying Options Utilized



Frequency of Actions Taken to Reduce Energy Burden

Table 9. How Often Respondents Turned off Equipment or Stopped Using Equipment to Reduce Their Energy Burden

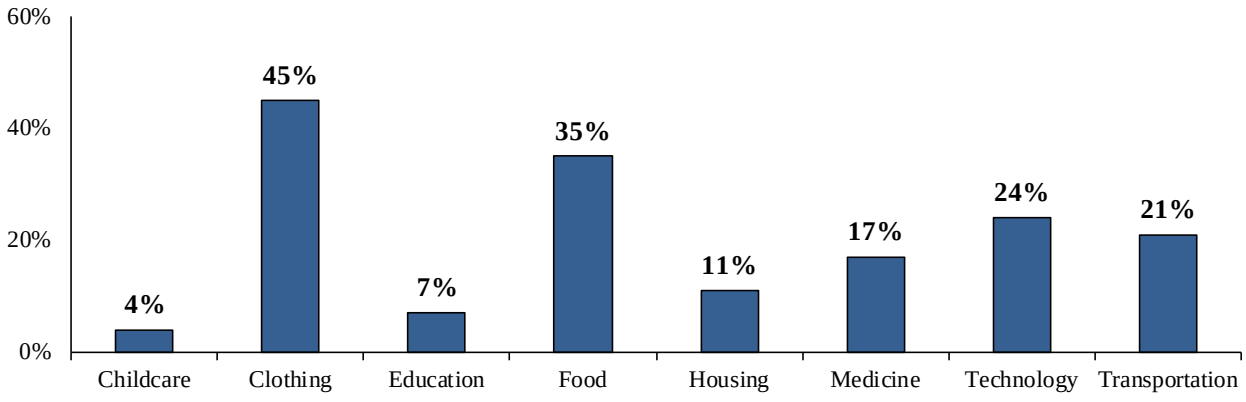
State of Texas	AC	Laundry	Dishwasher	Cooking	Lights	Office Equipment	Entertainment Equipment
Never	21%	51%	39%	59%	6%	17%	14%
Sometimes	41%	26%	16%	24%	8%	17%	17%
About half the time	20%	13%	10%	11%	9%	14%	16%
Most of the time	12%	6%	9%	4%	24%	18%	19%
Always	6%	4%	26%	3%	53%	34%	33%

The most frequent action taken to reduce their electricity bill was turning off the lights, while the most infrequent action taken was reducing the amount of food that they cooked.

Reductions in Spending

The next graph details the percentage of respondents that delayed or skipped payments on certain goods and services due to their utility bill.

Figure 48. Delayed or Skipped Payment — Texas



The highest reported delayed or skipped payment was clothing purchases, while the lowest delayed or skipped payment was in childcare related purchases. Also, the food category was the second highest reported delayed or skipped payment, which aligns with the current literature on energy poverty tradeoffs.[lxx] Table 10 below compares the respondent's level of income with delayed or skipped payments on good and services due to high electricity bills.

Table 10. Income versus Delayed or Skipped Payments

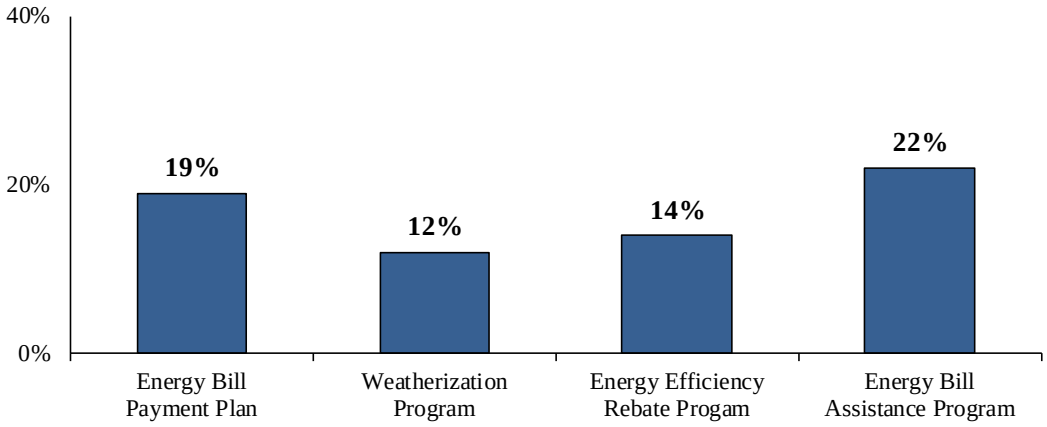
Whole Survey Population	Food	Medicine	Transportation	Housing	Childcare	Education	Clothing	Technology
Less than $10,000	40%	21%	30%	17%	4%	11%	50%	23%
$10,000-$19,999	45%	21%	30%	16%	4%	4%	48%	25%
$20,000 - $29,999	42%	22%	27%	12%	3%	6%	53%	27%
$30,000 - $39,999	38%	18%	20%	10%	4%	8%	45%	28%
$40,000 - $49,000	24%	13%	13%	6%	4%	5%	41%	19%
$50,000 - $59,999	28%	14%	14%	11%	5%	8%	42%	26%
$60,000 - $74,999	26%	11%	11%	4%	2%	3%	35%	20%

In most categories, as income increases, the likelihood that a respondent delays or skips necessary spending on goods and services due to high electricity bills decreases.

Energy Program Knowledge

The following graph details the reported knowledge of energy assistance programs.

Figure 49. Knowledge of Energy Assistance Programs — Texas

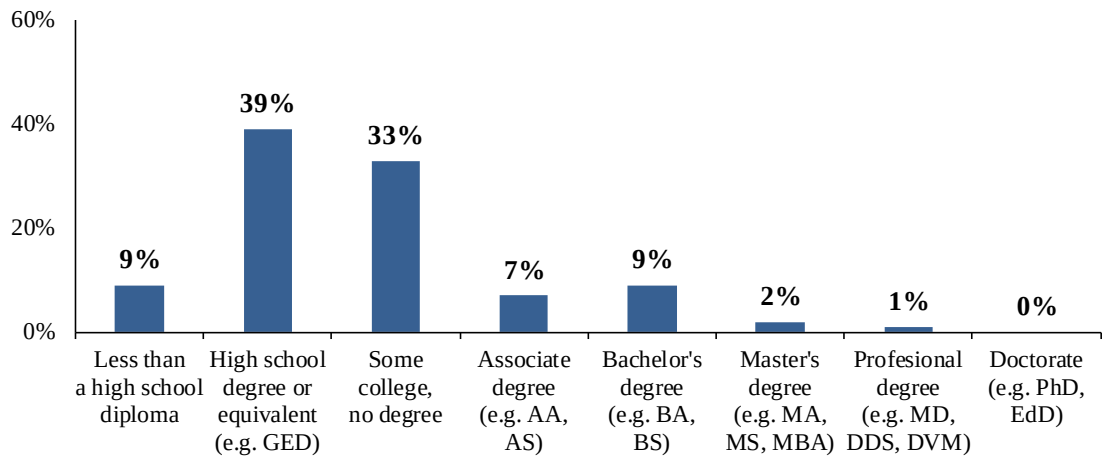


Survey respondents reported that they knew about energy bill assistance programs more than any other energy program. They knew the least about weatherization programs.

Education Level and Energy Poverty

The graph below compares the respondents' level of education with the energy poverty variable. This variable indicates the likelihood that a respondent is energy poor. There is a clear trend that as education level increases, the likelihood that a respondent is in energy poverty decreases. It is important to note that the survey did not have many respondents who had less than a high school diploma, which resulted in a smaller amount of people that were in energy poverty in that level of education.

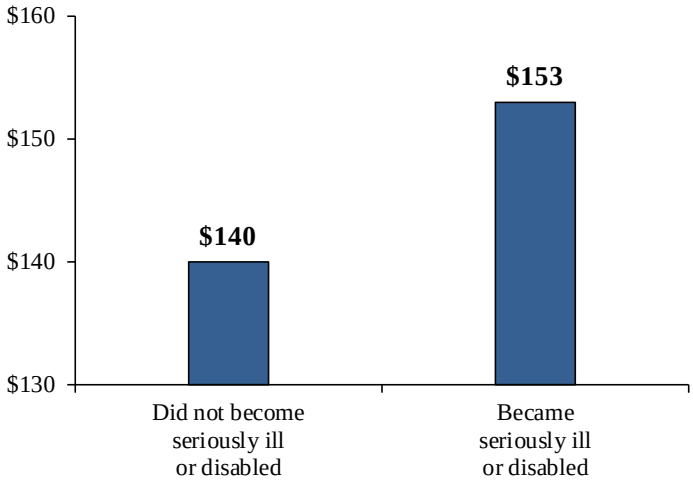
Figure 50. Education Level versus Energy Poverty Variable — Texas



Financial Hardships - Disabled Persons

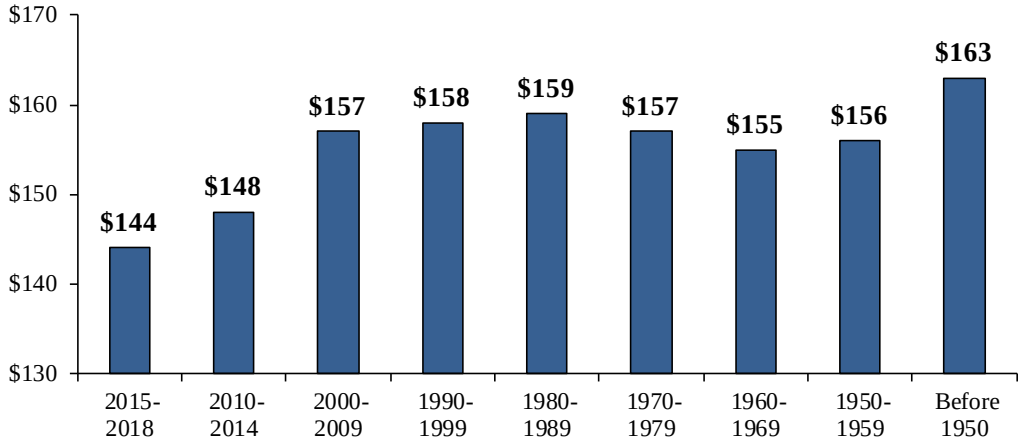
The graph below details the difference in average monthly energy bills between disabled respondents and non-disabled respondents.

Figure 51. Average Monthly Energy Bill versus Disability — Texas



From the graph, it is clear that disabled respondents, on average, have a higher energy bill than non-disabled respondents.

Figure 52. Year House Built versus Average Electric Bill



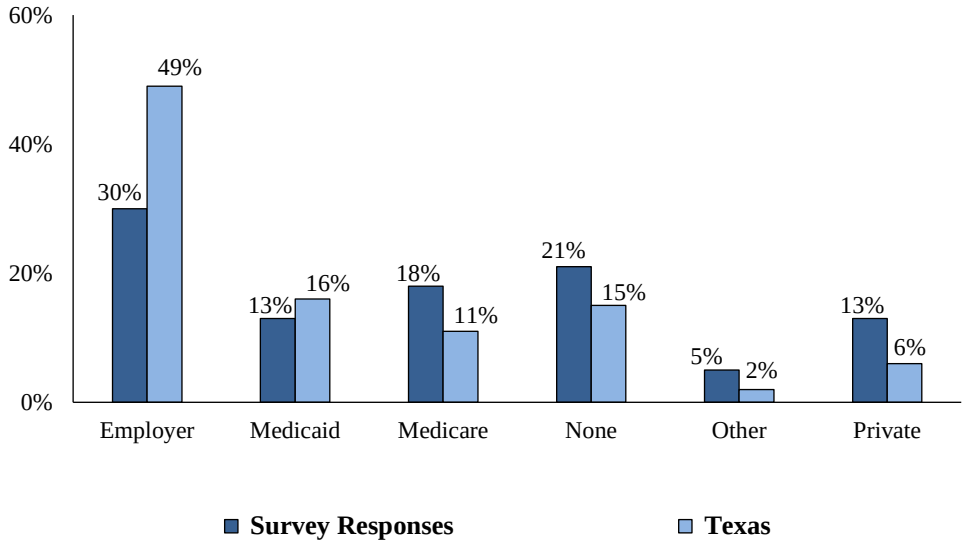
This graph represents the variation in average electricity bill to the age of a home. As expected, the bill is generally on the high end the older the home is. However, this data does not take into account home improvements, which may affect a respondent's answer. Also, there are several other elements that could be affecting the cost of an electricity bill, and it is unlikely the age of a household alone dictates the average cost of one's electricity bill.

3.2.5 Healthcare & Insurance

Survey Results

The survey distributed received 2,020 responses regarding the type of health care insurance the respondents obtained. The below graph shows how our survey responses compared to U.S. Census recorded statewide health insurance coverage.

Figure 53. Health Insurance Coverage



Source: Henry J Kaiser Family Foundation and TEPRI Survey

* *Note: "Other" for Texas is made up of Other Public health insurance. "Private Insurance" for Texas is made up of Non-Group insurance. The Kaiser Family Foundation did not collect information regarding private insurance of an unknown source.*

The above graph shows how the survey differs with previously known percentages of health insurance in Texas.

Just over 17% of respondents to the survey identified themselves as having a serious disability. All 11 of the regions had a greater percentage of respondents who identified as having a serious disability than the state average across all income groups.

Of the respondents, 20% identified as either themselves or someone from their household feeling sick or unhealthy due to the temperature within their home. Additionally, 25% identified as having felt stress or mental discomfort due to the temperature in their home. These feelings of sickness and stress occurred mainly during the Summer and Winter seasons. The numbers and corresponding graphs below show that temperature and the ability to manage temperature in their home has had an effect on the health and well-being of Texans.

Highest reported rates of temperature related stress or discomfort (Figure 54) were found in Region 7 (40% of households), while the lowest were founding Region 6 (21%); findings

likely attributable to the typically high relative humidity rates in the Eastern part of the state, and low humidity rates in the Southwestern part.

Figure 54. Temperature-Related Stress or Discomfort

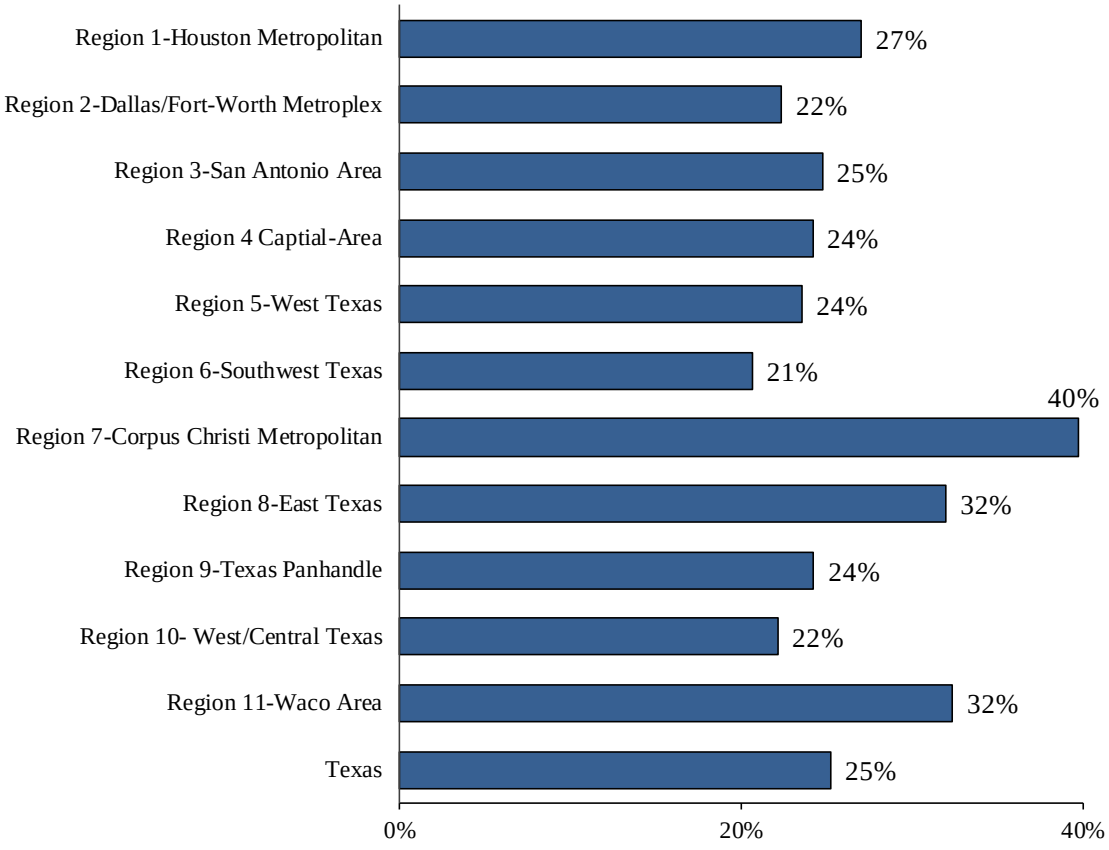


Figure 55. Respondents Who Felt Stress or Mental Discomfort Due to Temperature in Home

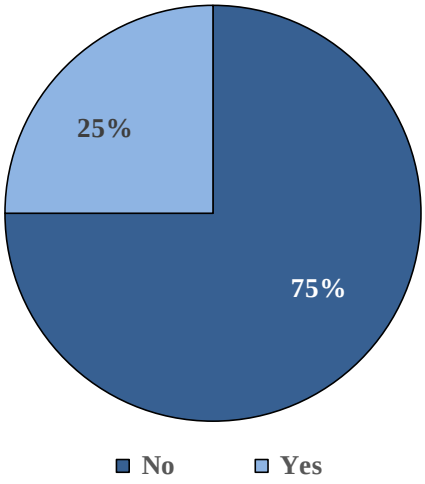


Figure 56. Respondent Household Members Who Felt Sick or Unhealthy Due to Home Temperature

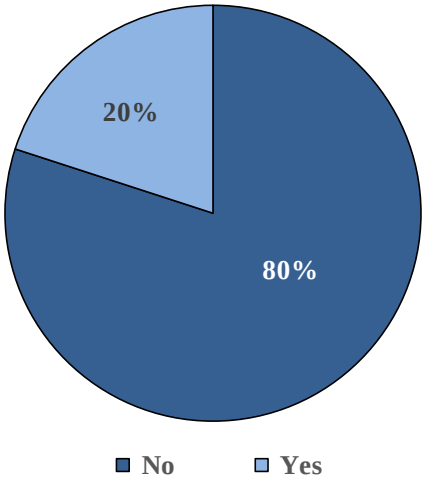
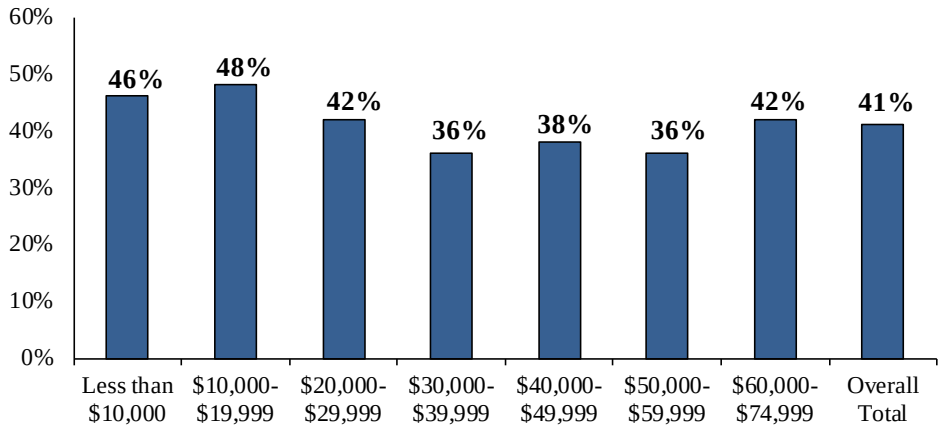


Figure 57. Respondents Who Felt Stress or Mental Discomfort Regarding Electric Bill — by Income Level



4. Interviews

4.1 Introduction

This portion of the report analyzes interviews of LMI energy consumers to draw qualitative links between the quantitative findings of the census data and survey responses. By incorporating accounts of lived experience, researchers sought to gain a more nuanced perspective on the relationships between demographic factors and energy consumption behaviors. This sampling of LMI consumers is limited in size and scope and cannot be considered as descriptive of the entire Texas energy landscape. However, these findings have the potential to shape further inquiry into the qualitative motivations behind energy consumer behavior.

4.2 Interview Findings Case Studies

The main findings from the interviews conducted center around the themes of energy conservation methods and motivations, ability to reduce energy costs, energy burden tradeoffs, and utility assistance programs.

4.2.1 Rio Grande Valley

Regional Profile

Colloquially known as “The Valley” by native Texans, the Lower Rio Grande Valley (RGV) encompasses the southwest border region of Texas. Its geographic proximity to Mexico has created a bicultural community as the regions preserves Mexican and Mexican American culture in South Texas. This is a vast region that includes eight cities and four counties. The interview participants for this study lived in different cities across Hidalgo and Cameron counties.

Hidalgo County has a population of 860,661 people, and 33% are under the age of 18 years old. As a majority-minority county, 92% reported being Hispanic or Latino, while 7% reported being White and 28% being foreign born. A language other than English is spoken at home for 85% of the population, and 30% do not have health insurance. Roughly 31% of the

county are in poverty,[lxxi] while 43% of the population under the age of 18 are in poverty.[lxxii] The annual unemployment rate in Hidalgo County in 2017 was 7% whereas the Texas unemployment rate in the same year was 4%. Roughly 81% of Hidalgo County residents are U.S. citizens.[lxxiii]

Cameron County has a population of 423,725 people, with 31% of persons being under 18 years old. Racially, 90% reported being Hispanic or Latino, and 9% said they were White, and 24% said they were foreign born. A language other than English is spoken at home for 74% of people over 5 years old, and 30% of people have no health insurance. In Cameron County, 29% of people live in poverty[lxxiv] while 40% of children under the age of 18 live in poverty.[lxxv] The unemployment rate in 2017 was 7%,[lxxvi] and 85% of the population are U.S. citizens.[lxxvii]

Rio Grande Valley Interviews

Eight residents interviewed were part of a local community union for low-income residents called La Union Del Pueblo Entero, or LUPE. Those interviewed came from the following cities and had the following energy companies. Please note that individuals interviewed shared their experiences with high-energy bills throughout time and are not always reflective of their experiences with their current company. The residents interviewed lived in Mission (2), Mercedes, Brownsville (2), San Juan, Edinburg, and Welasco. Five of the residents were Magic Valley Electric Cooperative customers while the other providers included Green Mountain Energy, AMBIT Energy, and Star Tex Power.

All eight interviewees considered themselves homeowners and none lived in multifamily housing. Six residents lived in a house, and two lived in trailer homes. Some were buying their property from a previous owner, while others mentioned a monthly bill to buy the land they live on. One woman called this a “solar” payment, or lot payment, which you pay month by month. Only once you pay in full can you start building your home on it. One resident commented that her family was able to make improvements and build a more energy efficient house only after her family finished paying the solar payment. Given this, homeowners who are engaging in this type of purchase do not have the ability to make immediate improvements to increase energy efficiency.

1. Conservation Methods & Motivations

Common activities to conserve energy included turning the air conditioner off at night when the air was cool, keeping the air conditioner on 75 degrees at all times, relying on windows for fresh air, and only using a heater in closed rooms. Six out of eight respondents had window unit air conditioning systems. One respondent said she did not have a central air conditioner in her home because they are expensive.

> *"We turn off the a/c at night when it's cooler so that we draw less electricity but not during the day because it is so hot here in Texas. We turn the lights off when no one is in the room. We turn the TV off if no one is watching it."*

A few mentioned energy efficient appliances. The types of energy efficiency appliances that respondents reported were blenders, freezers, and refrigerators. There was a general lack of knowledge of whether appliances were energy efficient or not and how kitchen stoves affect energy efficiency. Few mentioned using energy efficient light bulbs. One participant said they put special shades on their windows and built a patio to reduce the amount of sun entering the home, decreasing their need for the air conditioner.

> *"We put LED lights in. We have a gas stove instead of an electric to reduce the energy bill use as well."*

> *"I make my windows as dark as possible to make sure not a lot of lights comes inside the house. When it's cold, I'll try not to use the heater too much, only enough to make sure the house is comfortably warm. We try to make sure that every area is closed (doors and windows) whenever we use the air conditioner in order to make sure that none of the cold air gets out."*

Generally, energy conservation measures mentioned above were common practice for individuals who learned about these mechanisms from their own families. Most alluded to a financial motivation for using these practices to reduce their energy bill. However, those who did try to reduce their energy consumption recognized that it was also helping the environment, although it was not perceived as a motivation.

"I don't really focus on [energy consumption for environmental reasons] to be honest, but in the end, what I do ends up helping the environment anyways. You know how all of us like to waste energy and hurt the environment. But, consciously or unconsciously, we end up helping conserve energy and helping the environment."

"Yes, to save energy is saving us money in our pockets because you turn off the lights and the less lights you use the less energy you are using so its helps our energy bill and the environment."

Only one woman said she did not try to save energy due to the fact that these appliances were necessary to maintain her home. She also mentioned that she was not aware of energy conservation measures and did not have much trouble paying the energy bill due to her husband being retired and having a stable income each month. Age and financial stability may contribute to not having to think of energy conservation needs.

"No, [I don't try to decrease my energy consumption] since I don't know what to do. I wouldn't know what to do. What do we do when we only use the washer and the refrigerator? Right now, when it's not too hot, we don't even turn on the air or anything since it's still a bit cool. And we try to turn off lights when they're not needed, but honestly, what else can we do?"

2. Perceived Ability to Reduce Energy Costs

Financial constraints lead to the most issues with paying energy bills. Feelings of control over their energy costs were most frequent in families having two parents or the head of household had stable employment. The lack of work in the region caused a lack of ability to pay bills and induced stress. Respondents cited the minimum wage, income, employers that offer limited income, a lack of hours needed to make enough money to pay bills, and lack of employment. Most participants were able to identify a range for how much their energy bill costs each month, noting that the bill increases in summer and winter. The energy burden for this region is affected by extreme weather conditions in the summer and winter as is supported by the surveyed population.

"If my husband isn't working the hours needed, it affects us because sometimes there isn't enough to pay for the main bills (light, water, the basics)."

"Well, since my husband is retired, they send him his check and with what they pay me as a LUPE Volunteer, we're able to pay for the bills."

In terms of energy efficiency improvements, all respondents said they owned their home or were buying from the previous owner, therefore it was their responsibility to make improvements to the quality of the home. While some homeowners were able to make improvements to their homes, others noted that a lack of disposable income and random or sparse increases in their energy bills were a constraints to undertaking these projects.

Having insulated homes was a huge point of contrast between homeowners. Three homeowners said they had made improvements to the insulation in their homes. Some respondents commented that their homes were not well insulated, had holes and cracks in doors and windows, and had high energy bills compared to other participants. Windows specifically played a role in a household's perception of reducing energy costs.

"Yes [we have to turn up the air conditioner to keep the house cool, but], it depends on where the sun is hitting the house. If the sun is hitting/filling the house then yes we have to raise the air conditioner so it's a little cooler. We have large windows in the house so that's the issue."

"When we moved in here we had to fix the insulation since it didn't have it. There is a part of the house where the sun would hit it the whole day. We went to home depot and bought a product (like a fabric or cotton) that we put on the outside to keep the heat out because the sun coming through the house would keep the walls warm and there was no way to insulate those walls. So that is why we put this sheet outside so that it would keep the sun out from the outside since it would hit the sheet directly so that the sun wouldn't be as strong in the house and so it wouldn't be so warm in the house. So we put insulation and we also closed the gaps in the doors and windows. That's what we've been doing over the whole house. I have to do the renovations like this since I'm the one buying the house."

There was a range of perceptions related to the role energy providers play in the consumer's perceived control over their energy costs. Magic Valley Co-op was the energy provider for the majority of interview participants. Multiple respondents reported that they could not change energy companies due to their geographic location in a rural area, and only one said that the reason they would not change was because the other companies were more expensive. Although these customers do not feel they have an opportunity to switch companies, they do believe their company is one of the least expensive in the region and that the company provides other benefits.

> *"Truly we are happy with the company. However, even if we wanted to leave it we can't leave the company because of where we live. We can't leave the company since it's a co-operative; if we were in the city we could change it. We have benefits with the company since our kids can apply with scholarships with them each year when they are going to graduate. The company offers services besides just the electricity even though they don't have cost lowering programs."*

> *"Yes have had around two or three [providers], but they are more expensive than the one I currently have." (Magic Valley Customer, Weslaco, Texas).*

When there were a variety of providers in a region, many respondents said that they would not switch companies because all companies are expensive. On woman had a very bad experience when trying to switch her electric company that resulted in a high cost expense.

> *"Once, a few younger men came to offer me some light and they said they'd help me so that it could be cheaper, since I'd mentioned that the bill was getting more expensive. I spoke to the company and they told me there'd be a program but, unbeknownst to me, they'd already changed me without telling me...They later said that [since we broke the contract] I'd have to pay $200, but if I wanted to stay with the new company, I'd be charged. I had to pay $400 in the end- $200 for one and $200 for the other since we did not end staying with either company. They told me it wasn't a crime to steal clients amongst themselves, that they could do that…his happened to many of the people in my colonia. Many of them were charged*

cancellation fees, some didn't pay. This happened to many people, more than 10 people in my neighborhood.

A few participants mentioned they had called their energy company to make an arrangement if they could not pay for a high electric bill immediately. Others were unsure about the possibility of asking the company for an arrangement, which was a common theme in that many did not know about their ability to manage their high-energy bills better through their service provider.

"We try to cover the bills you have the means to first, and then try to find an arrangements with the company to pay the amount you can right now and agree to pay the rest later." (Magic Valley, Brownsville, Texas).

3. Energy Burden Tradeoffs

All participants mentioned that keeping food cold in the refrigerator was important to keeping electricity on in their homes. Some mentioned eating lower quality food like rice and beans or canned food as a trade-off for paying a high-energy bill. They also mentioned needing to sell possessions, sell homemade food, or getting a loan in order to pay the bill.

"Well, the food is more important than paying for the light, but we still need to pay for the light since if we don't, what little we have will go bad."

"For example, I don't work only my husband worked. I have six kids. Because we were a big family we had to stretch the check by prioritizing water, electricity and the solar (land) payment. Because if we didn't we wouldn't have any place to live. To eat, we can cook food that is inexpensive, like beans and tortillas like in Mexico, but we first we have to pay the bills first."

Medical issues were not seen overall as a tradeoff, although they were acknowledged as an energy burden.

"…One of my daughters has eczema so when it's hot outside, I need to put on the air for her. But now that she's mainly at school and not at home. Since we only use [the air conditioner] when the kids are on vacation from school and that's when the price

goes up, when she's home. Now, when she's at school, since most of the time I don't need to put on the air since it's cool at night.

Respondents reported that high-energy bills affected their personal comfort because they could not buy other things for their family due to the high expense. The rate of high rates of child poverty, low wages, and rate of unemployment all echo these constraints for families in this region. Most respondents who had an experience in which they could not pay their bills reported being stressed at least once or twice a year, usually occurring in the summer or winter. The effects of these stressors and high-energy expense affected families with children in the home the most.

"There's times where yes, when the payment on light goes up it does impair me since I didn't predict that I'd have to spend so much on the light/energy bill and, say, if I thought I was going to pay 80 but I paid 150, well then I'm short on other things. If I needed to buy, say, medicine, I know that it's more important to pay the light, or if I was going to need to buy some shoes for the kids, I know that I'm going to have to wait until next week to buy them since I need to pay for the energy bill. Yeah, this affects us at times in the house, be it personal or regarding medicine or any things that we need to consume in the house."

"[This stress affects my ability to] take care of the kids since if they want something, we have to deny them. Even though our kids don't ask for much, we still have to deny them. But we try nonetheless and there's still times where we want to give them something and it's either pay a bill or buy them a little something. If the kids say that they want something and one gets frustrated with them."

Additionally, the loss of a loved one, many times a male in the household, resulted in experiencing an inability to pay their energy bill and therefore having their energy turned off. In other regions of Texas, service providers respond to family emergencies such as these by providing leniency or a grace period before disconnection. While researchers are not able to generalize from this anecdote, one can assume that this is not an uncommon event in this region given the high prevalence of energy poverty based on data from the survey population.

"Yes they cut off my lights 2 years ago. They turned off my lights because my son got sick with cancer and passed away. We ran out of money so we couldn't pay the light bill for a month or two. After that they cut the lights off for a week or two and the company said they wouldn't put it back on until we paid. Because my children were no longer children, the importance of turning the electricity back on wasn't that important."

4. Energy Assistance Programs

Sources of information related to energy efficiency and assistance programs in this region include LUPE, a community organization, TV and mail advertisements, notices from schools, their utility company, and neighbors.

"With the organization (LUPE) they taught us how to conserve energy, water and lights and how we can save money in the home. Every month they give us different information or workshop each time."

"Well, sometimes through the news, sometimes through the light programs, that are for the community, sometimes through schools that send you info on the different programs one can go to get info on this."

There was general confusion and misinformation about energy assistance programs, who qualifies for them, and who are the sources of help. Many people believed that they would not qualify for an assistance program because of their age, lack of children in the home, or citizenship status. Two respondents did not know about or believe there to be any assistance program in their community. A few mentioned seeking help at local churches, while some that did not have an income reported the denial of assistance. One woman believed that her property would be taken away from her if she used an assistance program through the government, which is why she never sought to participate in an assistance program.

"I feel that the help is just for older people who needed help with their payments because my mom uses one of those services for her electric bill sometimes. There are also programs for younger people but you have to have a social security number. [I have not participated in these programs] because to participate in those programs

you need a social security number for them to help you and I don't have one. When you don't have a social security number they don't help you."

"In our community there is help but it is very difficult for people to qualify for the help. They will ask if you worked the previous three months and they can only help you if you don't have any other options for money at all. So, it's better to make an arrangement with the company."

Other respondents seemed to be aware of these programs but did not participate for various reasons.

"Once, we almost went to get help at the county to pay for the bill. I was calling (the county), but they told me to go at 5am to stand in line for excessive amount of hours. I'm older so standing in line that long is just not possible for me. The county told me they'd be able to help me, but it was too early/too difficult for me."

Generally, people are aware of assistance programs but believe they are unable to participate or have found other mechanisms to cope with high-energy burdens in the region such as budgeting or restricting their energy use. The information gained from qualitative interviews in this region support the findings from the surveyed population.

4.2.2 Odessa, Texas

Regional Profile

Odessa is a mid-sized city in West Texas about 130 miles South of Lubbock. As is typical of West Texas, Odessa has a semiarid climate with hot, sunny summers and mild, dry winters. This region receives much less rainfall than the rest of Texas and experiences larger temperature fluctuations on a day-to-day basis. Odessa is marginally more prosperous than Texas as a whole, with a median household income of $60,619 and a poverty rate of 11.8%.[lxxviii] With respect to ethnicity, 54.8% of residents are Hispanic, 37.2% are White, and 4.83% are Black,[lxxix] making Odessa a majority-minority city. Thanks to nearby oil and natural gas reserves, the dominant industry in Odessa is the energy industry, which employs many of its residents. The

presence of the energy industry is noteworthy in that it may have a spillover effect into public consciousness about energy consumption and conservation.

Odessa Interviews

Six low- and middle-income Odessa residents participated in interviews through the local Catholic Charities network. Four of the participants were TXU Energy customers, one was an Ambit Energy customer, and one participant was not sure who their energy provider was. Unlike interviewees from other regions in our study, everyone in this sample was a homeowner. Below, researchers will explore the major themes about energy use and consumption behaviors that emerged from our conversations with Odessa participants.

1. Conservation Methods & Motivations

All six interviewees indicated that they were motivated to conserve energy in order to reduce their utility bills. Nearly everyone described being conscientious about turning lights off, turning off air conditioning or heat when they were not at home, and unplugging appliances when not in use. Some respondents described their conservation efforts as common-sense behaviors rather than practices unique to them as LMI consumers. However, two respondents commented that they and their families sacrificed personal comfort because their utility bills were sometimes too expensive:

> *"In the past, I have turned my thermostat down to as much as I could, that's tolerable, and use more blankets. So that I don't have a $350 electricity bill again."*

> *"Money plays a role [in what temperature we keep our house], definitely. In the winter we just layer more clothes on and in the summer, well, we do the opposite."*

A handful of participants indicated that they had improved structural features of their home in order to improve energy efficiency.

> *"I bought my house [about 3 months ago] and I'm having to repair it. Putting in insulation is a priority, but because it's not fully insulated, my bill is slightly higher than it was at my previous place. We had gaps under doors and I'm having to add insulation. It's not efficient."*

Another participant mentioned that he had recently replaced 10 windows in his house to reduce draftiness. Because everyone in this group was a homeowner, they recognized that investing in the energy efficiency of their homes would reap long-term savings on utility bills.

When asked directly, none of the respondents indicated that they were motivated to conserve energy for environmental reasons, although about half of them considered this an added benefit.

2. Perceived Ability to Reduce Costs

Most of the residents in this sample perceived their energy bills to be too high.

> *"Sometimes the bill comes in and its higher than it should be, well in my eyes, it's higher than it should be . . . but you know, you would have to get it paid. You can't really live without electricity."*

As is typical of semiarid climates, energy costs spiked in the winters and summers. Two respondents said that their electricity bills could double or even triple in the summer months and go well into the hundreds of dollars. Some commented on the fact that dramatic temperature fluctuations from morning until night might mean that both air conditioning and heat are necessary on any given day. This may be a challenge that is unique to Texas energy consumers relative to climates with more stable daily temperatures.

Although all respondents noted the importance of the conservation methods outlined in the previous sections, they did not perceive these behaviors as having a significant impact on reducing their bills. Four out of six people were TXU energy customers. The other two people had switched from TXU to Ambit Energy and Interest Energy because they found more competitive rates.

> *"TXU is way, **way** too expensive, I mean as soon as I switched over, my bill went down, I mean **a lot**, so that's one of the reasons I switched over."*

> *"I like my new company. It's the cheapest I've ever had."*

In both cases, the respondents had only recently switched companies. The four TXU customers had been with the company for several years and noted that they had considered

switching companies to find better rates, but various obstacles prevented them from doing so. Most notably, those who did not switch were concerned about startup costs with a new company.

> *"I'm just afraid they'll ask for a deposit because I don't have the best credit, so I kind of just stick with [TXU] 'cause I already have it."*

Additionally, some respondents said that their providers changed rates or added fees without their knowledge, which led to unexpected increases and made it harder for them to balance monthly budgets.

> *"Actually, until recently I pretty much paid the same amount. We haven't followed up with TXU, and, actually, everyone in my neighborhood, we all have the same utility company, and everybody's bill went up in January. And we just figured, 'oh it's been colder, so we used more energy' but we never really questioned it."*

> *"They raised the rates for program we were on and so we are no longer on it. Now, we have to look at another program, but they're all higher than what we [had before]."*

As mentioned in the previous section, this group indicated that they made repairs on their homes to conserve energy more than they would have if they were renters. However, some mentioned that repairs were cost prohibitive. This was especially a problem for those who lived in old, inefficient homes but could not afford to improve structural deficiencies.

> *"It's an old, old home . . . it has high ceilings so I know that if I had lower ceilings I wouldn't waste so much energy."*

> *"[I put in] blackout curtains, but we have drafts in our house, so, well, we can't really afford to fix all of the cosmetic things in our home. So we just kind of cover up holes as best as we can."*

3. Energy Burden Tradeoffs

Five out of the six respondents said they had had their electricity shut off at least one time in the past, and some had experienced it several times. In most cases, the power was

disconnected as a result of an unexpected financial burden that rendered their household unable to keep up with their bills. The causes mentioned ranged from high childcare costs to broken down vehicles and medical emergencies.

> *"It got shut off once . . .[because]I was in a car accident and so there were a lot of sudden expenses."*

In order to prevent subsequent disconnections, some participants said that they would pay for energy bills using credit cards. Others said that they would turn to their family and social networks to seek help with payments.

> *"For help, I would ask my mother, and coworkers sometimes, and friends, or, you know, Facebook, I have a good Facebook family and, you know, I tell them, 'Whoa my light bill went up $200 and that was really unexpected' and people reach out and help out."*

Even so, energy bills rarely ranked among respondents' top priorities when it came to paying bills. Most said that food and rent were "obviously" more important to pay first. Some said that energy bills were somewhat of a "medium priority" and were more important to pay than outstanding debts or medical bills. Most people said that they would sacrifice their personal comfort in order to keep their energy bill low.

When asked to provide more detail about how energy costs impact their personal comfort, several respondents said that they had gotten sick because of the temperature that they keep their homes. Health consequences were especially prevalent among households with young children or the elderly.

> *"I've caught a few colds because of the cold house. We do have tile, and not carpet, so you know, you have to always wear slippers and stuff like that, and coming out of the shower from the heat to the cold, you know, it's been inconvenient."*

> *"My mother . . . her room is normally cold, so she's the one who gets colds, and things like that, more often than other people."*

4. Energy Assistance Programs

All of the respondents indicated some level of awareness about the energy assistance programs available in their area. Although they were all homeowners, no one said that they had utilized weatherization programs to improve the energy efficiency of their homes. This was a notable finding given that many expressed concerns about their homes needing repairs in order to be more energy efficient.

No one reported participating in payment plans or payment assistance through their utility companies. However, nearly everyone interviewed was familiar with similar services offered through Odessa-area nonprofits. When asked if they enrolled in any of these programs, all of the respondents said that they had not, despite the fact that most of them were concerned about keeping up with energy bills. One person noted that she did not apply for energy assistance because she perceived that other people in the community might have a higher need.

> *"[I don't use those programs because] if I can afford it, I would rather it be given to someone else who really can't afford it. That's the way I feel so I never try to get anything, I've never been on food stamps or anything, I feel like I'd be taking away from somebody who really needs it."*

Opting out of assistance programs may indicate a critical difference between how low- and middle-income residents perceive their need for help. Although the same respondent as above said that she sometimes worried about paying her energy bills, it was clear that she had never considered seeking external help.

Most respondents learned about energy assistance programs through nonprofits, community outreach, and local television ads. This might explain why their awareness skewed towards assistance options offered by nonprofits rather than government or private sector options.

4.2.3 Waco Metropolitan Area

Regional Profile

Waco is a small city in Central Texas about 90 miles North of Austin and 90 miles south of Dallas. The surrounding metropolitan area consists of the McLennan and Falls counties with a population of 234,906. Waco has a humid subtropical climate with hot, sunny summers and mild, winters, and the region receives 36 inches of rainfall per year. Waco has the 4th highest poverty rate in Texas and 50th highest nationally at 19.4%, and a median household income of $46,590. With respect to ethnicity, 25.8% of residents are Hispanic, 56.2% are White, and 14.9% are Black.[lxxx] Healthcare and Social Assistance industry, Retail trade, and Educational Services industry, including Baylor University and local community colleges, dominate the Waco economy.[lxxxi] The presence of the Education Services industry is noteworthy in that it may have a spillover effect into public consciousness about energy consumption and conservation.

Waco Interviews

Eleven low- and middle-income Waco residents participated in interviews through the local NeighborWorks network. Most, but not all, interviewees in this sample were renters. Interview participants lived in different cities across McLennon and Falls counties, while ten rented their homes, and one owned their home. Below, researchers explored the major themes about energy use and consumption behaviors that emerged from our conversations with Waco participants.

Participants were clients of the following Energy companies: four participants were TXU customers, one was an Ambit Energy customer**,** one was a Direct Energy customer, one was a First Choice Power customer, one was a Change Energy, one was an Oncor customer, one was a TXU Energy customer, and one was a Reliant Energy customer. Note that individuals interviewed shared their experiences with high-energy bills throughout time and are not always reflective of their experiences with their current company.

Main themes of the Waco area interviews included energy conservation motivated by saving money, balancing energy costs while ensuring home temperatures can protect children's health, split incentives to conserve energy between renters and landlords, and navigating changing pay dates with energy bill due dates. In addition, most interviewees noted knowing

about and using Economic Opportunity Advancement Corporation (EOAC), Caritas of Waco, or Lite-Up Texas services in the past and present.

1. Conservation Methods & Motivations

The primary motivation of energy conservation among interviewees in all Waco areas was financial need. Many participants also referenced the importance of saving energy for environmental reasons but said they do not choose to reduce energy use for that reason specifically. Methods of reducing energy consumption common among all interviews in Waco included turning off the air conditioner or heater when leaving the home, turning off lights when not present in the room, unplugging appliances not in use, improving weatherization (replacing windows), using energy-saving lights, and using fans instead of air conditioning. This indicates that energy poverty in Waco is not due to consumer ignorance about methods of conserving energy but rather due to limited finances related to other factors.

> *"Yeah I always try to conserve energy. It makes it more affordable. I control the temperature more, wash less, that kind of thing."*

Choosing to keep the temperature in homes more moderate in order to protect an interviewee's children and their health was also a common motivation among Waco interviews. Balancing health and cost were a key theme, signaling that health and the presence of children in a home directly impact energy burdened consumers' daily tradeoffs. Specifically, children having asthma or allergies came up multiple times.

> *"I have to regulate the temperature because if I don't my daughter will be breathing hard. She can't be in a hot house because she has asthma, and that makes it worse. I can't be like, 'oh, I want to conserve energy,' because it makes her breathing worse."*

> *"In the summertime sometimes when I don't run the air conditioning, my daughter has asthma, it can play an impact in her health. And just generally feeling bad, too, because it gets hot in Texas."*

2. Perceived Ability to Reduce Costs

Waco renters said they were not motivated to make energy efficiency improvements in their homes due to short-term living plans. Only one renter had made improvements because they had lived there for some time and they had a good relationship with their landlord. Those who did make weatherization improvements, renter or homeowner, saw dramatic reductions in their energy bills. A few landlords had made efficiency improvements by replacing windows and doors in apartment units, but these cases were not in the majority. This reflects the commonly found split incentives to make efficiency improvements between renters and landlords also seen in existing literature.

> *"You know, weatherization stuff and things like that, they have some free programs that do that for you, but I never really got into all that, especially because I don't own my home. I'm not going to."*

> *"It depends on what type of repair it is. If it's something that's the wear and tear of the house, that's my landlord. My landlord has never made [energy efficiency] improvements, no. I don't spend my own money for that because I rent. If I owned I would definitely go ahead and make those changes because you're seeing that return, but it's not worth it when you rent."*

All Waco interview participants said that deciding between trade-offs was stressful, and multiple participants expressed wanting to protect their kids from that (if they have children). This provides a picture of the effect energy burden has on mental health in the Waco area and should be explored further in future research.

> *"And as far as getting payment plans, it doesn't really help that much because you just get behind. It's really stressful. I live in a small 2 bedroom duplex, and the bills are the same as when I lived in a big 4 bedroom before. That's why I moved to a smaller place. I think it has something to do with the units. And I don't know how it's insulated."*

> *"It causes stress, a lot of stress. It's probably been my overall attitude as far as budgeting, but I wouldn't let it affect my child because I wouldn't want him to know*

anything about that. And work, I have to prioritize it because it's how I pay those bills so I can't let it affect that. Mentally, personal, yes it has an effect."

The majority of Waco interview participants plan to pay their energy bill each month using a planned budget that they follow in order to make sure they can pay their bills. Additionally, a few people did not feel they could contact their energy company about their bill, and a few participants did not know that was a possibility. Most participants also said that they turn to family if they cannot pay their bills one month. Some only look to emergency assistance organizations and have no other backup option.

"First would be my parents, and then maybe my daughter, but we have help agencies too you know so if it gets to a point where nobody else can help me, we can go to one of the help agencies."

Finally, in terms of participants choosing to change energy companies, most participants were happy with their current energy company. Some said they would be interested in switching companies but that the fees required to do so, or to change payment plans, prevents that.

3. Energy Burden Tradeoffs

Participants in Waco said that pay periods determine when they are able to pay their energy bills, with multiple people saying that they have had to wait a few days past the due date of their utility bill until they receive a paycheck to pay the bill. Income, pay periods, and hourly pay determined when most participants could pay their utility bills, which was consistent theme among the Waco interviews and indicates a clear relationship between income and energy burden.

"[Changes in my paycheck] doesn't affect my ability to pay, but it does affect my ability to pay ***on time****."*

Almost every participant said they trade-off personal comfort or buy less food to ensure they can pay their bills, and that this is the primary way of reducing costs so that they can pay the bill. Some also said that in the face of trade-offs, they would buy less transportation. A couple interviewees also mentioned that they would trade off paying their phone bill or student loans in

order to pay their energy bill. This indicates the balance of food, personal comfort, and finances all contributing directly to energy burdened consumers' daily choices.

> *"If I get an expensive bill one month, the next month I'm going to be like 'the energy has been high.' So December and January- because I've been sleeping with the fan instead of my air conditioning, and my bill has gone down like 100 dollars."*

> *"If I couldn't afford my energy bill one month I would buy less food. We have been known to open the windows and go without AC in the summer and just turn on fans, and it does get hot sometimes. And then just cutting corners elsewhere, not going out to movies and doing things with the kids. In the past I did it a lot, I've become a lot more financially stable in the last few years, it's not that bad but I would say before 2015 it was like every summer I was struggling."*

Most participants know of ways to reduce their energy use and do so actively (including turning off lights and air conditioning, covering windows, etc.). Participants learned about these methods to reduce energy consumption through self-education, being taught to do so by family as a child (the most common method), through education on television or online, and from working at an energy company. Lack of education on ways to reduce energy use was not a contributing factor to being energy poor or energy burdened.

> *"Working for the electric company, I learned a lot about how to conserve energy, you know stuff like that, but it was working for the electric company."*

> *"[I learned about to reducing energy use] just growing up with my family, just a learned behavior."*

4. Energy Assistance Programs

In the Waco area, only participants have utilized a few energy assistance programs. Multiple respondents, who expressed feeling how helpful it was, had previously used the statewide Lite-Up Texas program.

> *"I used to get this, Texas had this, what is it, Light-Up discount, and I used to get that and that was really beneficial, but I don't think they have that anymore. I used it annually probably up until it was discontinued. Maybe 10 years."*

Interviewees also referenced knowing about EOAC and Caritas energy assistance programs in Waco. However, there was poor awareness of programs for assistance paying utility bills, and there was especially poor awareness of weatherization services among participants in the area, as well expressed as frustration about this. Prevalence of energy burden in reference to the available resources in a community, and lack of knowledge about them, was a frequent theme that resulted in higher levels of severity of energy burden.

> *"My mom taught me about what services are available as a child, but I like to share that with a lot of people because there are a lot of people who were never taught and don't know where to go. So they just deal with the burden and being without, and never reach out to resources. Something needs to happen. Even here, some of the places that I've found, like this place that I found, I only know about it because I was driving down the street and I was like, 'Hey what is that place? Let me Google it,' but that was it. I didn't have exposure to it."*

Building further on awareness of assistance services, participants expressed a need for a better system of informing people about the services available in their community. The most commonly described way of learning about services was word of mouth. When the information routes in their community are cut-off, or when groups who fail to learn of existing programs in their area, the ability of consumers to alleviate their energy burdens is reduced.

> *"[I usually get news about services available in my community] just [by] word of mouth, or I see flyers. I think I heard about this [program] at another home buying workshop type thing that I went to."*

5. Summary Analysis

Drawing on findings from the literature review, the statewide survey, and the interviews conducted with LMI consumers, we offer the following recommendations.

5.1 Recommendations

- **Create a replacement program for LITE-UP Texas, a discontinued, means-tested discount on electricity bills.**
  - Retail electric providers may voluntarily waive a 5 percent late fee for electricity bill, delay security deposit payments, and offer deferred payments for high summer bills. However, this is viewed as less beneficial than LITE-UP Texas was. A sound replacement is needed for LITE-UP Texas.

- **Increase support to low-income residents via the weatherization program by increasing the gas tax.**
  - Consider increasing the threshold for family income for those who qualify for weatherization and monetary assistance

- **Mandate energy efficiency for multifamily housing (apartments) and rental units for renters**
  - The City of Austin's Energy Conservation Audit and Disclosure Ordinance (ECAD) could be implemented on the State level for residential, multifamily, and commercial properties. This policy mandates energy audits and disclosures for all homes and buildings served by Austin Energy. This policy creates greater transparency for homeowners, renters, and tenants regarding their expected energy expenditures for a specific property. Mandated audits and disclosures can also highlight specific energy efficiency improvements that could be made to a home or commercial property which can suppress long-term energy costs. This type of program would increase the amount of information available to Texas energy customers and provide insight on methods to reduce future energy consumption.

- **Raise the ten percent energy efficiency budget for utility companies since this goal is easily met each year.**

- **Increase outreach and education related to energy efficiency.**

    - It is well documented that low-income households live in less efficient housing. Many Texas residents are not aware of efficiency cost saving measures. Additional resources are needed to more fully disseminate this information to the public**.**

- **Re-examine energy provider reliance on contractors.**

    - It can be difficult to hold contractors accountable for the vetting and training of their employees, and for every contract there may be layers of subcontractors. This is not always in the public's interest and may be a disservice to low-income customers who rely on these services.

    - Energy providers under the regulation of the PUC should move away from contractors who don't address the low-income customers or older homes or other issues

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Appendix A. Survey Instrument

Texas Communities Profile Series Survey

Welcome to the University of Texas at Austin's Lyndon B. Johnson School of Public Affairs & TEPRI:

Screener (5 Questions)
- How old are you?
- Do you live in Texas?
- How long have you lived in Texas?
- Which of the following best describes your household's annual income in 2017, before taxes?

Part I: Household Characteristics (17 Questions)
Part II: Energy Efficiency (21 Questions)
Part III: Financial Situation (15 Questions)
Part III: Financial Situation (continued) (5 Questions)
Part IV: Healthcare & Insurance (12 Questions)
Part V: Demographics (7 Questions)
Survey Complete (1 Question)

Q1 Welcome to the University of Texas at Austin's Lyndon B. Johnson School of Public Affairs & TEPRI's Texas Communities Profile Series Survey. This research is designed to provide a detailed understanding of Texas residents and their relationships to energy. Your participation in this survey is greatly appreciated.

Your answers on the survey will be confidential. This survey is programmed to display questions based on your input. Therefore, the amount of time to complete the survey will vary depending on your responses. The average survey length is approximately 10-15 minutes.

If you have questions, concerns or complaints regarding this study, you may contact the project lead, Michelle Plunkett, at mplunkett@utexas.edu.

Click here to learn more about this project.

Do you agree to participate in this survey?

- ❍ Yes (1)
- ❍ No (2)

Q2 How old are you?

- ❍ Under 18 years (1)
- ❍ 18 to 24 years (2)
- ❍ 25 to 34 years (3)
- ❍ 35 to 44 years (4)
- ❍ 45 to 54 years (5)
- ❍ 55 to 64 years (6)
- ❍ Age 65 or older (7)

Q3 Do you live in Texas?

- ❍ Yes (1)
- ❍ No (2)

Q4 How long have you lived in Texas?

- ❍ Less than 6 months (1)
- ❍ 6 months to 1 year (2)
- ❍ 1 year or longer (3)

Q5 Which of the following best describes your household's annual income in 2017, before taxes?

- ❍ Less than $10,000 (1)
- ❍ $10,000 - $19,999 (2)
- ❍ $20,000 - $29,999 (3)
- ❍ $30,000 - $39,999 (4)
- ❍ $40,000 - $49,999 (5)
- ❍ $50,000 - $59,999 (6)
- ❍ $60,000 - $74,999 (7)
- ❍ $75,000 or more (8)

Q6 Do you make household energy management decisions?

- ❍ Yes (1)
- ❍ No (2)
- ❍ I don't know (3)

Q7 Part I: Household Characteristics

This section of the survey will ask you about your household and living situation.

Q8 Excluding anyone visiting temporarily or anyone away in the military, please indicate the total number of occupants in your household:

- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7 (7)
- ❍ 8 (8)
- ❍ 9 (9)
- ❍ 10 (10)
- ❍ More than 10 (11) _____

Q9 How many members of your household are adults over the age of 18?

If Excluding anyone visiting temporarily or anyone away in the military = 1

- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)

❍ 4 (4)
❍ 5 (5)
❍ 6 (6)
❍ 7 (7)
❍ 8 (8)
❍ 9 (9)
❍ 10 (10)
❍ More than 10 (11) _____

Q10 How many members of your household are under the age of 18?

If Excluding anyone visiting temporarily or anyone away in the military = 1

❍ 1 (1)
❍ 2 (2)
❍ 3 (3)
❍ 4 (4)
❍ 5 (5)
❍ 6 (6)
❍ 7 (7)
❍ 8 (8)
❍ 9 (9)
❍ 10 (10)
❍ More than 10 (11) _____

Q11 How many occupants of your household are adults over the age of 65?

If Excluding anyone visiting temporarily or anyone away in the military = 1

❍ 1 (1)
❍ 2 (2)
❍ 3 (3)
❍ 4 (4)
❍ 5 (5)
❍ 6 (6)
❍ 7 (7)
❍ 8 (8)
❍ 9 (9)
❍ 10 (10)
❍ More than 10 (11) _____

Q12 From the list below, please indicate your relationships with the adults in your household and how many of each:

If Excluding anyone visiting temporarily or anyone away in the military = 1

_____ Spouse (1)
_____ Partner (2)
_____ Boyfriend/girlfriend (19)
_____ Brother/sister (12)
_____ Step-brother/sister (13)
_____ Brother/sister-in-law (14)

_____ Friend(s) (7)
_____ Adult son/daughter (6)
_____ Adult step-son/daughter (5)
_____ Son-in-law/daughter-in-law (4)
_____ Adult grandchild (15)
_____ Cousin (20)
_____ Parent/guardian (8)
_____ Step-parent (9)
_____ Parent-in-law (11)
_____ Aunt/uncle (21)
_____ Grandparent (16)
_____ Other (23)

Q13 Please indicate the number of minors in your household for each range in the list below:

If How many members of your household are under the age of 18? = 0

_____ 0-2 years (1)
_____ 3-5 years (3)
_____ 6-8 years (4)
_____ 9-11 years (5)
_____ 12-14 years (6)
_____ 15-18 years (7)

Q14 How long have you lived at your current address?

If How long have you lived in Texas? =1 year or longer

❍ 1 - 3 years (1)
❍ 3 - 6 years (2)
❍ 6 - 9 years (3)
❍ More than 10 years (4)

Q15 What type of home best matches where you live?

❍ House (1)
❍ Apartment or Condominium (2)
❍ Mobile Home (3)
❍ Other (4) _____

Q16 Do you own or rent your home?

❍ Own (1)
❍ Rent (3)
❍ Other (5) _____

Q17 Is your home financed?

❍ Yes (1)

❍ No (2) If Do you own or rent your home? = Own

Q18 How is your home financed?

If Is your home financed? = Yes

- ❍ Mortgage (1)
- ❍ Loan (3)
- ❍ Other (4) _____

Q19 How many total apartment units are in your building?

If What type of home best matches where you live? = Apartment or Condominium

- ❍ 1-5 (1)
- ❍ 5-10 (2)
- ❍ 15-20 (3)
- ❍ More than 20 (4)

Q20 How many stories is your home?

If What type of home best matches where you live? = House

- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 or more (4)

Q21 What is the approximate square footage of your home?

_____

Q22 How many bedrooms are in your home?

- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ 6 or more (6)

Q23 Please indicate approximately when your home was built.

- ❍ Before 1950 (1)
- ❍ 1950 - 1959 (2)
- ❍ 1960 - 1969 (3)
- ❍ 1970 - 1979 (4)
- ❍ 1980 - 1989 (5)
- ❍ 1990 - 1999 (6)
- ❍ 2000 - 2009 (7)
- ❍ 2010 - 2014 (8)
- ❍ 2015 - 2018 (10)
- ❍ I'm not sure (9)

Q24 Part II: Energy Efficiency

This section of the survey will ask you about your home's **energy efficiency**.

Q25 During daylight hours, does your home rely more on natural lighting from windows or artificial lighting from lamps and light bulbs?

❍ Natural Lighting (1)
❍ Artificial Lighting (2)

Q26 What type of air conditioning does your home have?

❍ Central air conditioning (1)
❍ Window mounted air conditioner (2)
❍ Ductless mini-split air conditioner (4)
❍ A different type of air conditioning system (5)
❍ My home does not have an air conditioning system (6)

Q27 How old is your home air conditioning system?

If What type of air conditioning does your home have? = My home does not have an air conditioning system

❍ Brand New (1)
❍ 1-5 years 2)
❍ 6-10 years (3)
❍ 11-15 years (4)
❍ 15 years or more (5)
❍ I'm not sure (6)

Q28 Please select from the list each type of appliance you have in your home.

❒ Refrigerator (1)
❒ Electric Stove (2)
❒ Gas Stove (3)
❒ Dishwasher (4)
❒ Washer (5)
❒ Dryer (6)
❒ Television (7)
❒ Desktop Computer (8)
❒ Laptop (9)
❒ Ceiling Fan (10)
❒ Landline Telephone (11)
❒ Water Heater (13)
❒ Microwave (14)
❒ Other (12) _____

Q29 How old is your refrigerator?

If Please select from the list each type of appliance you have in your home. = Refrigerator

❍ Less than 1 year old (1)
❍ 1 - 5 years (2)
❍ 5 - 10 years (3)
❍ 10 - 15 years (4)
❍ 15 years or more (5)
❍ I'm not sure (6)

Q30 Are there large cracks or open spaces in your home's windows or doors?

❍ Yes (1)

❍ No (2)

Q31 Please indicate how much you agree with each statement.

	Strongly disagree (18)	Somewhat disagree (19)	Neither agree nor disagree (20)	Somewhat agree (21)	Strongly agree (22)
My house is not drafty at all. (1)	❍	❍	❍	❍	❍
It is hard to keep my house at a comfortable temperature. (2)	❍	❍	❍	❍	❍
Disagreement over the temperature indoors is common at my house. (3)	❍	❍	❍	❍	❍

Q32 How many rooms in your home have a ceiling fan?

If Please select from the list each type of appliance you have in your home. = Ceiling Fan

❍ 1 (1)
❍ 2 (2)
❍ 3 (3)
❍ More than 3 (4)

Q33 How often do you use a ceiling fan?

If Please select from the list each type of appliance you have in your home. = Ceiling Fan

❍ Always (1)
❍ Sometimes (2)
❍ Never (3)

Q34 What types of light bulbs do you use in your home?

❒ Incandescent bulbs (1)
❒ CFL bulbs (2)
❒ LED bulbs (3)
❒ I'm not sure (4)

Q35 Typically, how many days of the week is a member of your household at home at any point between the hours of 9AM and 4PM?

❍ 0 days (1)
❍ 1 day (2)
❍ 2 days (3)
❍ 3 days (4)
❍ 4 days (5)
❍ 5 days (6)
❍ 6 days (7)
❍ 7 days (8)

Q36 Typically, how many days of the week is a member of your household at home for the entire period between the hours of 9AM and 4PM?

- ❍ 0 days (1)
- ❍ 1 day (2)
- ❍ 2 days (3)
- ❍ 3 days (4)
- ❍ 4 days (5)
- ❍ 5 days (6)
- ❍ 6 days (7)
- ❍ 7 days (8)

Q37 Is there a device in your home that uses a lot more electricity than would normally be used in a home? An example could include medical equipment.

- ❍ Yes (1)
- ❍ No (2)

Q38 What is that device?

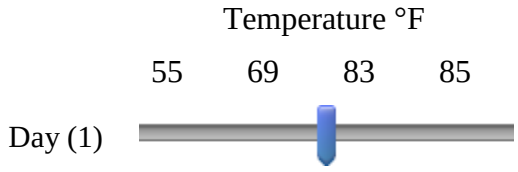
If Is there a device in your home that uses a lot more electricity than would normally be used in a... = Yes

---

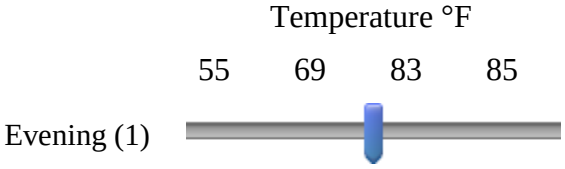
Q39 How would you describe the temperature in your home during the summer?

- ❍ Hot (1)
- ❍ Moderately Warm (2)
- ❍ Comfortable (3)
- ❍ Moderately Cold (4)
- ❍ Cold (5)

Q40 At what temperature does your household normally set the thermostat or air conditioner during the day in the summer?



Q41 At what temperature does your household normally set the thermostat or air conditioner during the evening in the summer?



Q42 How would you describe the temperature in your home during the winter?

- ❍ Hot (1)
- ❍ Moderately Warm (2)
- ❍ Comfortable (3)

❍ Moderately Cold (4)
❍ Cold (5)

Q43 What is the average set temperature on your thermostat or air conditioner during the day in the winter?

Temperature °F

55 69 83 85

Day (1) 

Q44 What is the average set temperature on your thermostat or air conditioner during the evening in the winter?

Temperature °F

55 69 83 85

Evening (1) 

Q45 Part III: Financial Situation

This section of the survey will ask you about your financial situation as it relates to your household's regular costs and sources of income.

If Do you own or rent your home? = Rent

Q46 How much is your monthly rent?

_____

If How is your home financed? = Mortgage

Q47 How much is your monthly mortgage payment?

_____

If How is your home financed? = Loan

Q48 How much is your monthly loan payment?

_____

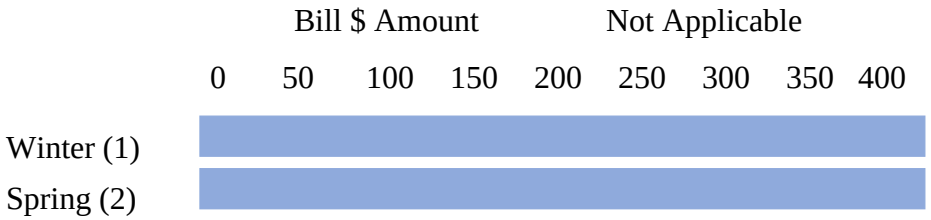
Q49 Please indicate how much you agree with each of the following statements:

	Strongly disagree (18)	Somewhat disagree (19)	Neither agree nor disagree (20)	Somewhat agree (21)	Strongly agree (22)
My household reviews the electricity bill each month. (1)	❍	❍	❍	❍	❍
When my electricity bill is high, my household is able to reduce our usage for the next month. (2)	❍	❍	❍	❍	❍
My household has a good understanding about which appliances increase the electricity bill the most. (3)	❍	❍	❍	❍	❍
My household has a good understanding about which activities increase the electricity bill the most. (4)	❍	❍	❍	❍	❍
My household understands how to program the thermostat. (5)	❍	❍	❍	❍	❍

Q50 Have you programmed your thermostat?

❍ Yes (1)
❍ No (2)
My thermostat is not programmable. (4)

Q51 Please drag the bars to select the dollar amount of your average monthly electricity bill for each season.



Summer (3)

Fall (4)

Q52 Since June 2017, have you or other members of your household experienced any of the following? (Please select all that apply)

- ❒ Lost a job or become unemployed (1)
- ❒ Had work hours or pay reduced (2)
- ❒ Received foreclosure or eviction notice (3)
- ❒ Divorced or separated from spouse/domestic partner (4)
- ❒ Had a death of a household member (5)
- ❒ Had a baby (6)
- ❒ Cared for elderly or disabled household member (7)
- ❒ Became disabled or seriously ill (8)
- ❒ Experienced a natural disaster (9)
- ❒ ⊗None of the above (10)

Q53 Since June 2017, has your household had difficulty paying each type of bill?

	Yes (1)	No (2)
Electricity bill (1)	❍	❍
Bills for other basic needs such as food, housing, medicine, etc. (2)	❍	❍

Q54 Since June 2017, what financial options did you use to pay your electricity bills or meet your household's basic needs? Please select all that apply.

- ❒ Use your household's current income (1)
- ❒ Use your household's savings or other investments (2)
- ❒ Cut back on non-essential spending for things your household wants (3)
- ❒ Reduce your household's energy usage (4)
- ❒ Borrow money from family, friends or peers (5)
- ❒ Borrow money using a short-term loan (6)
- ❒ Use a credit card (7)
- ❒ Leave rent/mortgage unpaid (8)
- ❒ Leave some household bills unpaid past the due date (9)
- ❒ Received emergency assistance from my electricity provider (10)
- ❒ Received emergency assistance from other city or regional programs (11)
- ❒ ⊗None of the above (12)

Q55 Since June 2017, how many times did you utilize emergency assistance from my electricity provider? Please enter a number.

If Since June 2017, what financial options did you use to pay your electricity bills or meet your ho... = Received emergency assistance from my electricity provider

_____

Q56 Since June 2017, how many times did you utilize emergency assistance from other city or regional programs? Please enter a number.

If Since June 2017, what financial options did you use to pay your electricity bills or meet your ho... = Received emergency assistance from other city or regional programs

_____

Q57 Since June 2017, how often, if at all, did you take the following actions to reduce your household's electricity usage?

	Never (6)	Sometimes (7)	About half the time (8)	Most of the time (9)	Always (10)
Turned off air conditioning or heating (1)	❍	❍	❍	❍	❍
Avoided doing laundry (2)	❍	❍	❍	❍	❍
Avoided running the dishwasher (3)	❍	❍	❍	❍	❍
Avoided cooking (4)	❍	❍	❍	❍	❍
Turned off lights not in use (5)	❍	❍	❍	❍	❍
Turned off office equipment (computer, printer, etc.) (6)	❍	❍	❍	❍	❍
Turned off entertainment system (TV, Nintendo, etc.) (7)	❍	❍	❍	❍	❍

Q58 Do your utility bills cause you to delay or skip necessary spending or payments in any of the following categories? Please select all of that apply.

- ❒ Food (1)
- ❒ Medicine (2)
- ❒ Transportation (3)
- ❒ Housing (4)
- ❒ Childcare (5)
- ❒ Education (6)
- ❒ Clothing (7)
- ❒ Technology (8)
- ❒ Other (9) _____

Q59 Are you aware of any of the following types of energy efficiency or assistance programs?

- ❒ energy efficiency rebate program (12)
- ❒ energy bill assistance program (9)
- ❒ energy bill payment plan (10)
- ❒ weatherization program (11)

❒ None of the above (13)

Q60 Have you participated in or received benefits?

If Are you aware of any of the following types of energy efficiency or assistance programs?= None of the above

❍ Yes (1)
❍ No (2)
❍ I don't know (3)

Q61 Are you enrolled through your electricity provider or a public agency?

If Have you participated in or received benefits? = Yes

❍ Electricity provider (1)
❍ Public agency (2)
❍ Other (3) _____

Q62 Please provide the name.

If Are you enrolled through your electricity provider or a public agency? = Electricity provider

Or Are you enrolled through your electricity provider or a public agency? = Public agency

_____

Q63 Since June 2017, how many times have you received benefits?

If Have you participated in or received benefits = Yes

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)
6 (6)
7 (7)
8 or more (8)

Q64 Please provide the name.

If Have you participated in or received benefits? = Yes

_____

Q65 Part IV: Health & Insurance

This section of the survey will ask you about your household's health and insurance situation.

Q66 Please indicate the type health care coverage that best reflects your current plan.

❍ Private (1)
❍ Employer (2)
❍ Medicaid (3)
❍ Medicare (4)
❍ None (5)

❍ Other (6) _____

Q67 What is your annual health care deductible per person?

❍ Less than $100 (1)
❍ $100-$999 (2)
❍ $1000-$1999 (3)
❍ $2000-$2999 (4)
❍ $3000-$4999 (5)
❍ $5000 or more (6)
❍ None (7)
❍ I don't know (8)

Q68 Are there any occupants with disabilities or special needs in your household?

❍ Yes (1)
❍ No (2)

Q69 Do any of the following apply to you or other members of your household?

❒ Serious Disability (1)
❒ Serious Respiratory Condition (2)
❒ Other Serious Condition (3) _____

Q70 Has the temperature in your home ever made you or any member of your household feel sick or unhealthy?

❍ Yes (1)
❍ No (2)

Q71 During what season(s) did this feeling occur?

If Has the temperature in your home ever made you or any member of your household feel sick or unhealthy? = Yes

❒ Summer (1)
❒ Fall (2)
❒ Winter (3)
❒ Spring (4)

Q72 Approximately how many weeks did this condition last?

If Has the temperature in your home ever made you or any member of your household feel sick or unhealthy = Yes

❍ 1 week (1)
❍ 2 weeks (5)
❍ 3 weeks (6)
❍ 4 weeks (7)
❍ 5 weeks or longer (8)

Q73 Has the temperature of your home ever caused you stress or mental discomfort?

❍ Yes (1)
❍ No (2)

Q74 During what season(s) did this stress or mental discomfort occur?

If Has the temperature of your home ever caused you stress or mental discomfort? = Yes

- ❒ Summer (1)
- ❒ Fall (2)
- ❒ Winter (3)
- ❒ Spring (4)

Q75 Approximately how many weeks did this condition last?

If Has the temperature of your home ever caused you stress or mental discomfort? = Yes

- ❍ 1 week (1)
- ❍ 2 weeks (5)
- ❍ 3 weeks (6)
- ❍ 4 weeks (7)
- ❍ 5 weeks or longer (4)

Q76 Do your electricity bills cause you stress or mental discomfort?

- ❍ Yes (1)
- ❍ No (2)

Q77 Part V: Demographics

The final section of this survey will ask you to provide demographic information.

Q78 What is your zip code?

_____

Q79 Are you of Hispanic, Latino, or of Spanish origin?

- ❍ Yes (1)
- ❍ No (2)

Q80 How would you describe yourself?

If Are you of Hispanic, Latino, or of Spanish origin? = No

- ❒ American Indian or Alaska Native (1)
- ❒ Asian (2)
- ❒ Black or African American (3)
- ❒ Native Hawaiian or Other Pacific Islander (5)
- ❒ White (6)
- ❒ Other (7) _____

Q81 What is your marital status?

- ❍ Single (never married) (5)
- ❍ Married (1)
- ❍ Separated (4)
- ❍ Widowed (2)
- ❍ Divorced (3)
- ❍ Other (6)

Q82 What is the highest degree or level of school you have completed? (If you're currently enrolled in school, please indicate the highest degree you have received.)

- ❍ Less than a high school diploma (1)
- ❍ High school degree or equivalent (e.g. GED) (2)
- ❍ Some college, no degree (3)
- ❍ Associate degree (e.g. AA, AS) (4)
- ❍ Bachelor's degree (e.g. BA, BS) (5)
- ❍ Master's degree (e.g. MA, MS, MBA) (6)
- ❍ Professional degree (e.g. MD, DDS, DVM) (9)
- ❍ Doctorate (e.g. PhD, EdD) (7)
- ❍ Other (8) _____

Q83 What is your current employment status?

- ❒ Employed full time (40 or more hours per week) (1)
- ❒ Employed part time (up to 39 hours per week) (2)
- ❒ Self-employed (8)
- ❒ Unemployed and currently looking for work (3)
- ❒ Unemployed and not currently looking for work (4)
- ❒ Student (6)
- ❒ Retired (5)
- ❒ Unable to work (7)

Q84 Thank you for taking this survey. Please acknowledge that you have completed the survey by selecting the option below. Then click "Next".

- ❍ Done (1)

Appendix B. Aggregate ACS Tables

Housing Structure

Year Structure Built

Region	Year Structure Built: Built 2010 or later	Year Structure Built: Built 2000 to 2009	Year Structure Built: Built 1990 to 1999	Year Structure Built: Built 1980 to 1989	Year Structure Built: Built 1970 to 1979	Year Structure Built: Built Pre-1969
1	3.8%	24.5%	14.7%	16.2%	19.1%	21.8%
2	2.9%	22.5%	16.7%	19.1%	15.3%	23.5%
3	3.8%	23.5%	14.7%	16.1%	15.2%	26.7%
4	4.6%	29.9%	19.4%	18.5%	13.7%	14.0%
5	4.5%	18.6%	14.4%	15.0%	16.8%	30.6%
6	3.2%	26.7%	21.4%	18.4%	14.0%	16.4%
7	1.8%	13.3%	12.1%	16.3%	18.6%	37.9%
8	2.9%	14.8%	14.6%	16.2%	19.0%	32.5%
9	2.1%	12.5%	10.5%	13.8%	17.1%	44.0%
10	2.6%	11.6%	11.8%	15.9%	16.4%	41.7%
11	3.1%	18.3%	15.5%	17.1%	17.4%	28.5%
Total	3.3%	21.8%	15.6%	17.2%	16.7%	25.5%

Source: ACS Table B25034

Units in Structure

Region	Units in Structure: 1	Units in Structure: 2 to 4	Units in Structure: 5 to 9	Units in Structure: 10 to 19	Units in Structure: 20 to 49	Units in Structure: 50 or more	Units in Structure: Mobile home + other
1	65.9%	3.7%	4.7%	9.0%	4.6%	7.0%	5.1%
2	67.0%	4.5%	6.5%	7.4%	4.2%	5.4%	5.0%
3	70.0%	4.9%	5.4%	6.3%	3.5%	3.4%	6.5%
4	63.0%	6.1%	4.4%	8.0%	6.2%	7.1%	5.2%
5	70.5%	7.8%	5.4%	5.4%	2.1%	2.9%	5.9%
6	68.8%	8.5%	3.2%	2.4%	1.5%	2.1%	13.4%
7	70.9%	8.0%	5.1%	3.0%	1.5%	2.4%	9.0%
8	70.9%	4.8%	3.3%	2.7%	1.2%	1.5%	15.6%
9	74.1%	5.2%	2.5%	3.2%	2.1%	2.4%	10.5%
10	72.3%	4.4%	3.3%	3.2%	1.4%	1.8%	13.6%
11	69.0%	7.2%	3.4%	3.6%	1.7%	1.7%	13.4%
State	67.9%	5.1%	4.8%	6.3%	3.5%	4.6%	7.7%

Source: ACS Table B25024

Number of Bedrooms

Region	Bedrooms: No bedroom	Bedrooms: 1 bedroom	Bedrooms: 2 bedrooms	Bedrooms: 3 bedrooms	Bedrooms: 4 bedrooms	Bedrooms: 5 or more bedrooms
1	1.7%	14.8%	21.5%	37.1%	20.7%	4.2%
2	1.7%	14.2%	21.3%	39.5%	19.1%	4.2%
3	2.0%	12.6%	21.7%	42.6%	17.9%	3.2%
4	2.4%	15.2%	22.4%	37.3%	18.9%	3.8%
5	3.0%	8.8%	20.4%	47.4%	17.3%	3.1%
6	2.7%	9.5%	27.6%	44.2%	13.3%	2.7%
7	3.3%	10.8%	26.8%	45.1%	12.2%	1.7%
8	1.6%	8.2%	27.0%	49.7%	12.0%	1.5%
9	2.1%	9.3%	25.8%	49.3%	11.8%	1.8%
10	2.7%	10.1%	26.7%	46.7%	12.1%	1.8%
11	1.8%	9.2%	26.9%	46.3%	14.1%	1.8%
State	2.0%	12.6%	23.1%	41.5%	17.4%	3.4%

Source: ACS Table B25041

Household Makeup

Presence of Elderly

Region	Households by Presence of People 65 Years and over by Household Size by Household Type: Households with one or more people 65 years and over:	Households by Presence of People 65 Years and over by Household Size by Household Type: Households with no people 65 years and over:
1	19.9%	80.1%
2	20.5%	79.5%
3	24.2%	75.8%
4	17.3%	82.7%
5	24.6%	75.4%
6	26.1%	73.9%
7	27.9%	72.1%
8	29.7%	70.3%
9	26.0%	74.0%
10	29.0%	71.0%
11	27.1%	72.9%
State	22.6%	77.4%

Source: ACS Table B11007

Presence of Children

Region	Households by Presence of People Under 18 Years by Household Type: Households with one or more people under 18 years:	Households by Presence of People Under 18 Years by Household Type: Households with no people under 18 years:
1	39.4%	60.6%
2	38.6%	61.4%
3	37.2%	62.8%
4	33.7%	66.3%
5	43.3%	56.7%
6	50.1%	49.9%
7	35.5%	64.5%
8	33.1%	66.9%
9	34.7%	65.3%
10	33.7%	66.3%
11	32.5%	67.5%
State	37.8%	62.2%

Source: ACS Table B11005

Household Size

Region	1	2	3	4	5	6	7+
1	24.4%	29.9%	17.0%	15.4%	8.1%	3.1%	2.0%
2	25.1%	31.1%	16.6%	15.0%	7.5%	3.0%	1.8%
3	25.4%	31.2%	16.8%	14.2%	7.4%	3.0%	2.0%
4	27.7%	33.0%	15.8%	13.9%	6.0%	2.1%	1.4%
5	21.6%	26.9%	18.9%	16.8%	9.5%	3.8%	2.4%
6	16.9%	24.6%	17.5%	17.4%	12.5%	6.2%	4.9%
7	24.6%	33.7%	17.0%	12.8%	7.3%	2.6%	2.0%
8	27.2%	35.1%	15.5%	12.5%	6.1%	2.3%	1.3%
9	26.5%	34.2%	15.3%	13.5%	6.5%	2.7%	1.4%
10	26.5%	34.8%	14.9%	13.1%	6.5%	2.6%	1.6%
11	26.6%	36.0%	15.3%	12.5%	6.1%	2.3%	1.2%
State	25.0%	31.5%	16.5%	14.6%	7.6%	3.0%	1.9%

Source: ACS Table B11016

Marital Status

Region	Married	Not-Married
1	50.7%	49.3%
2	50.7%	49.3%
3	48.5%	51.5%
4	47.1%	52.9%
5	50.2%	49.8%
6	54.5%	45.5%
7	48.2%	51.8%
8	49.6%	50.4%
9	49.9%	50.1%
10	51.4%	48.6%
11	49.9%	50.1%
State	50.2%	49.8%

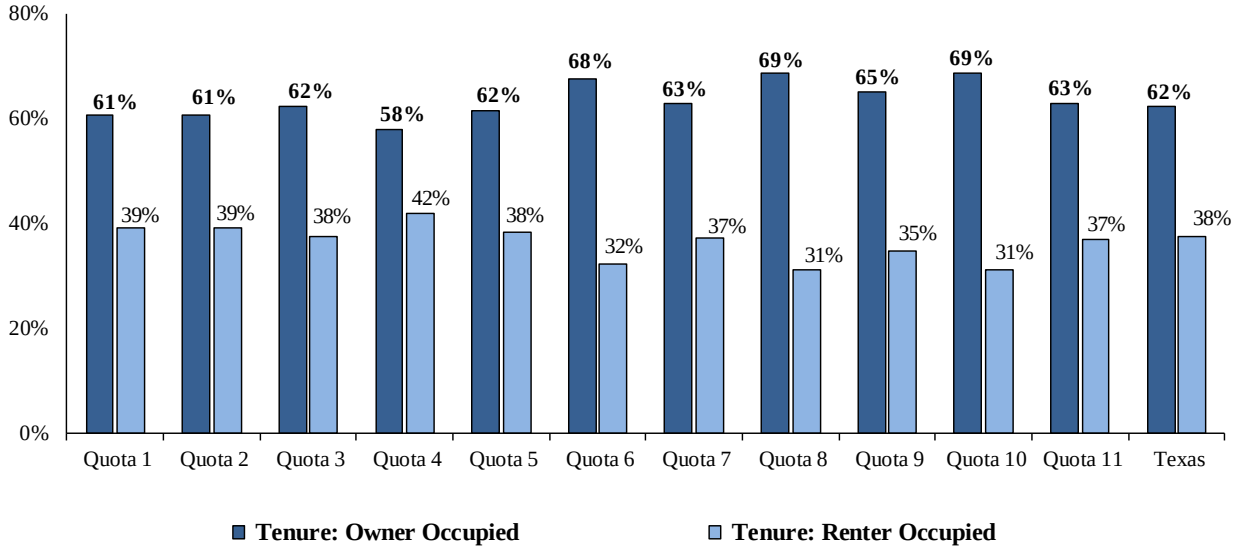
Source: ACS Table B11001

Owner vs. Renter

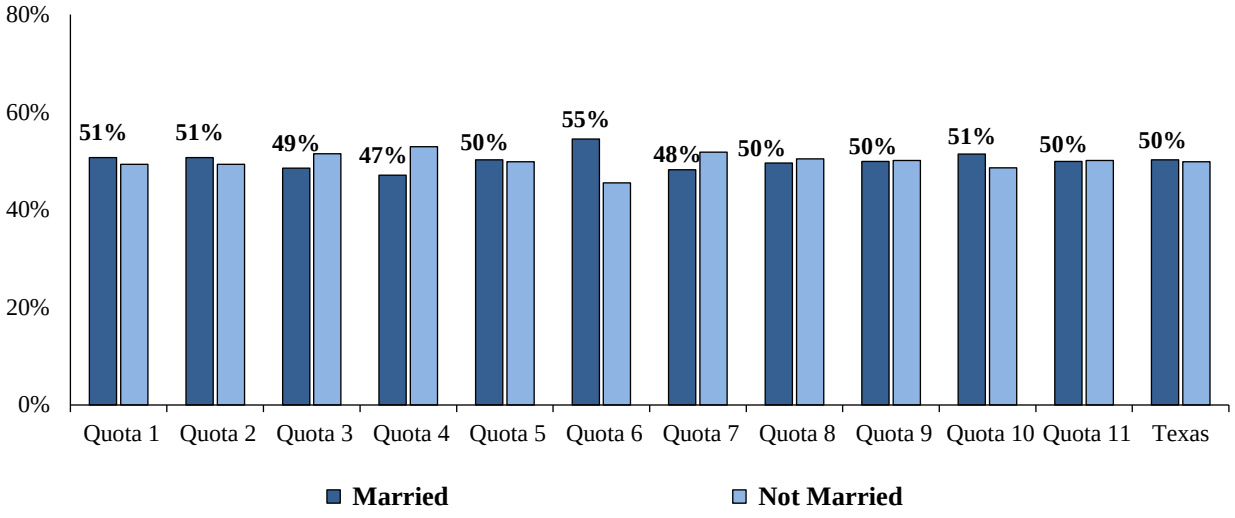
Region	Tenure: Owner occupied	Tenure: Renter occupied
1	60.8%	39.2%
2	60.8%	39.2%
3	62.4%	37.6%
4	58.0%	42.0%
5	61.6%	38.4%
6	67.6%	32.4%
7	62.8%	37.2%
8	68.8%	31.2%
9	65.1%	34.9%
10	68.7%	31.3%
11	63.0%	37.0%
State	62.3%	37.7%

Source: ACS Table B25003

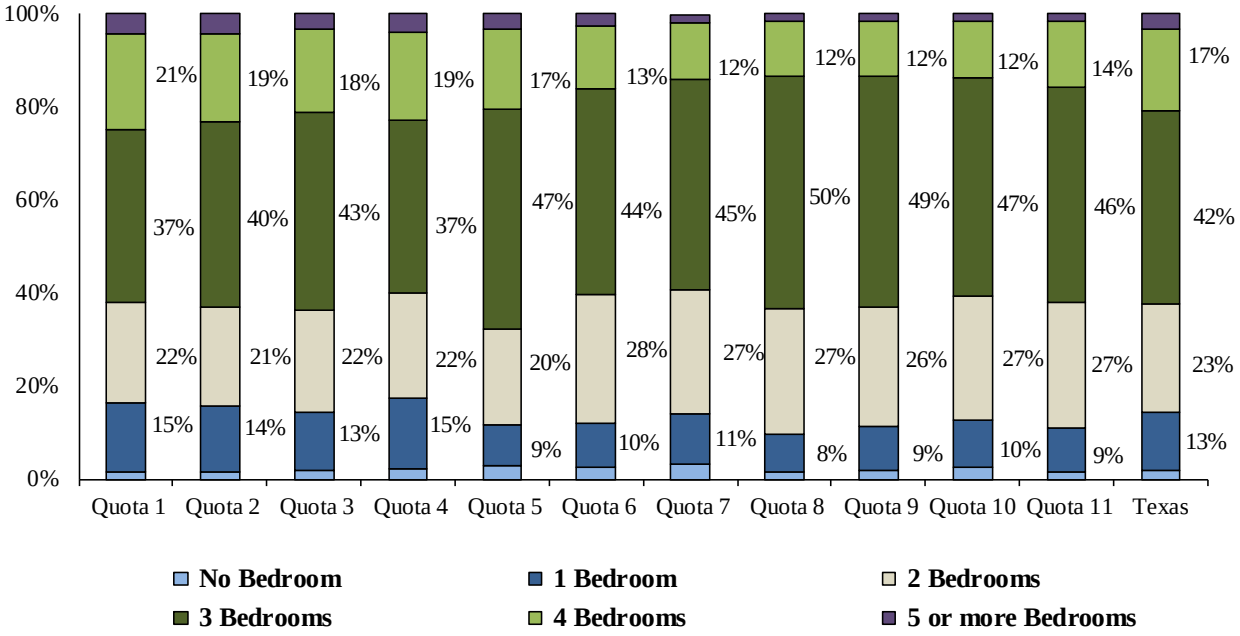
OWNER VERSUS RENTER



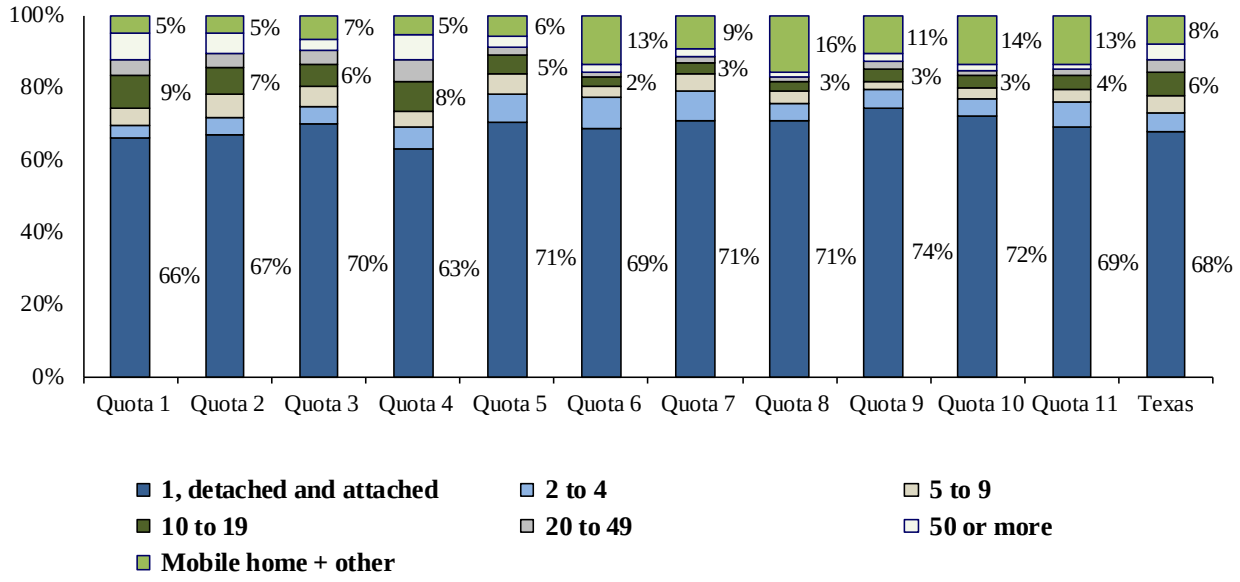
MARITAL STATUS



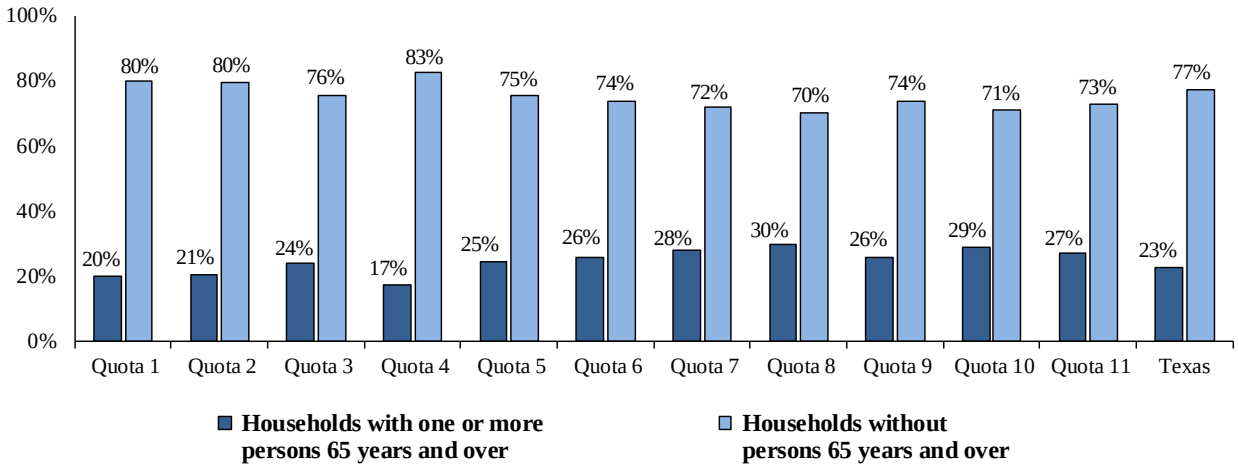
NUMBER OF BEDROOMS



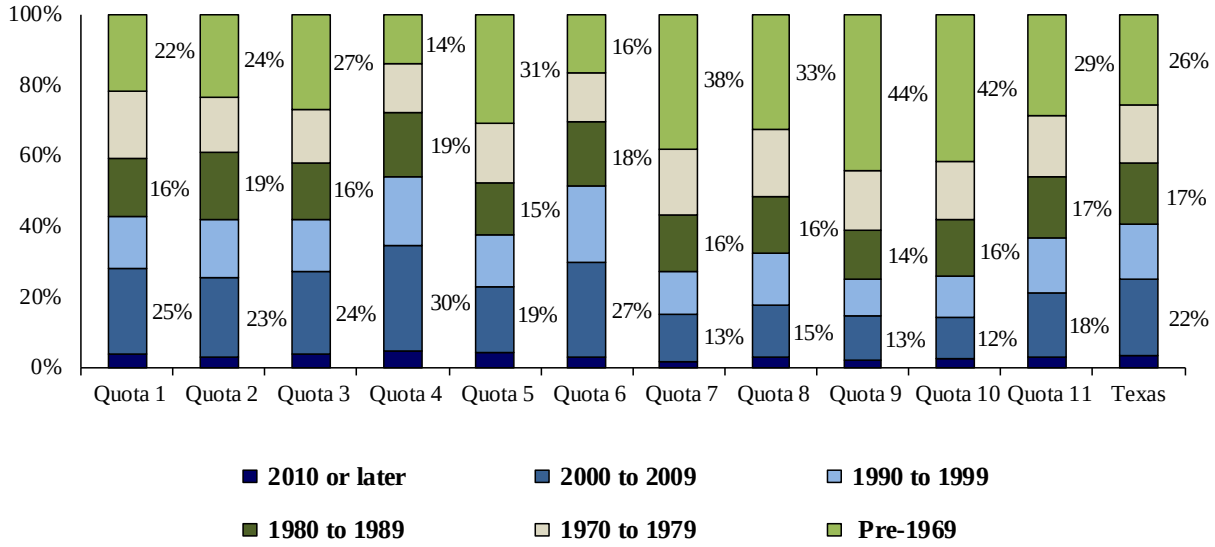
UNITS IN STRUCTURE

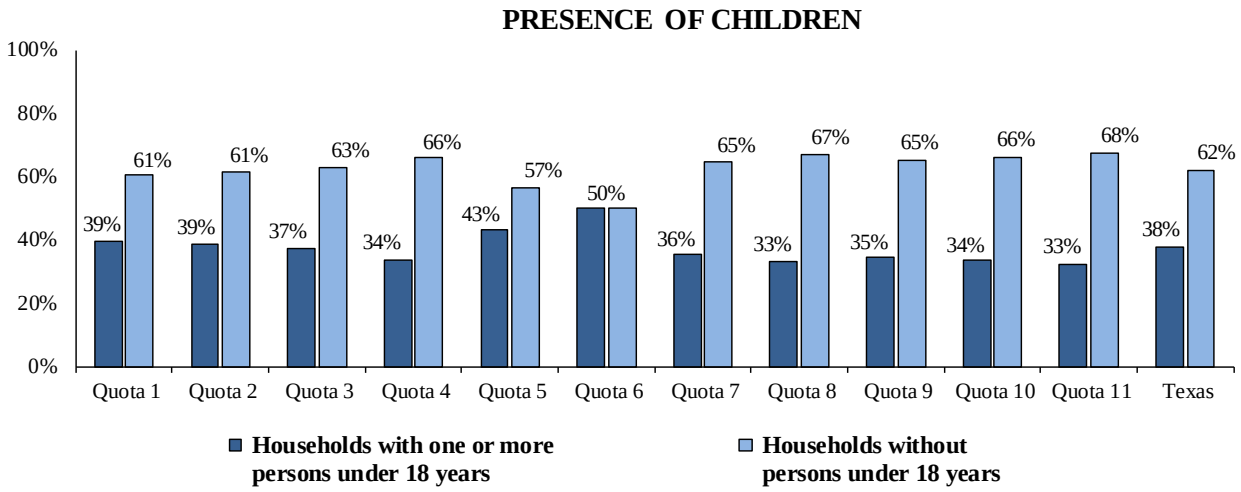


PRESENCE OF ELDERLY



YEAR STRUCTURE BUILT



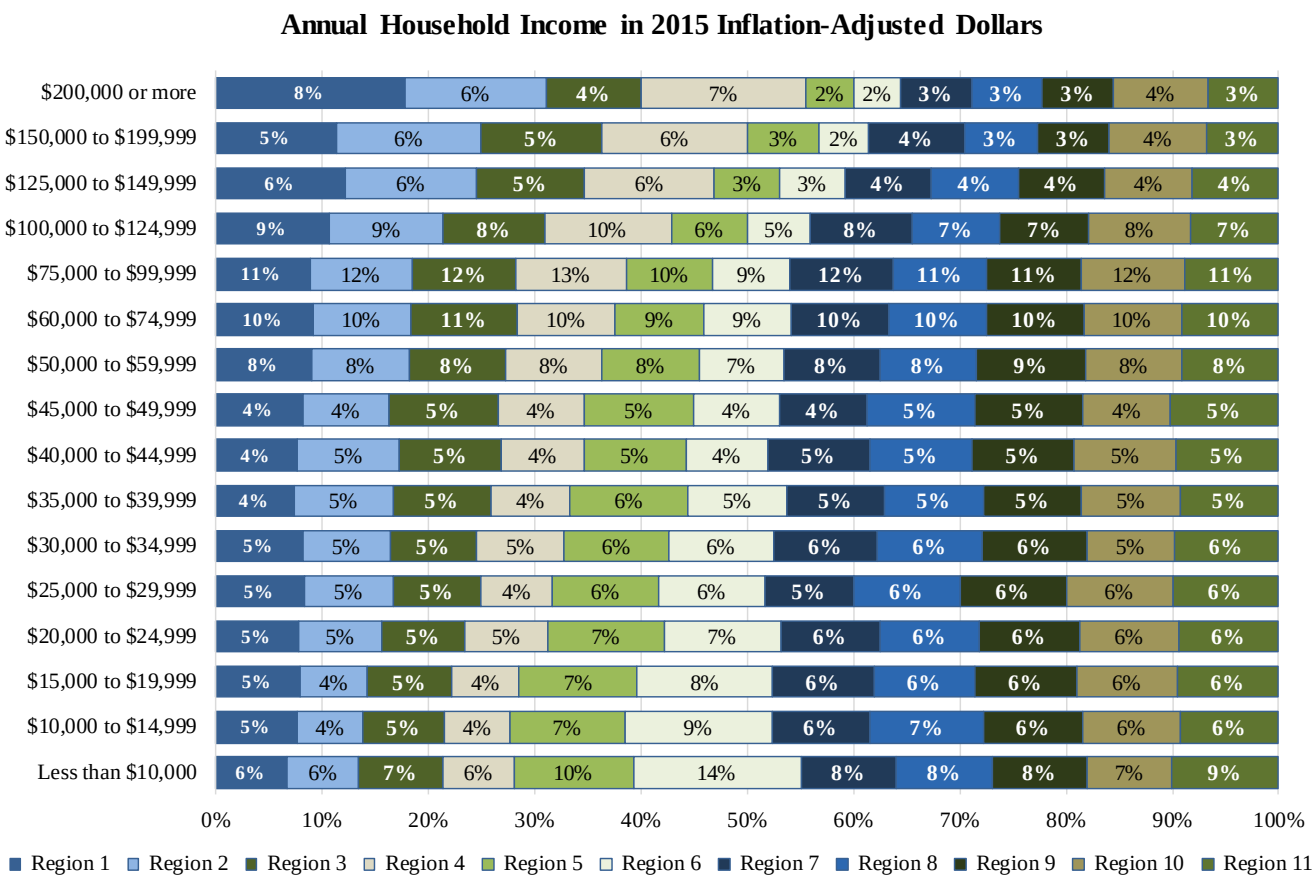


Economic Hardships

Income

Household Income	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
Less than $10,000	136,764	150,096	56,720	40,679	24,943	63,840	21,293	51,200	29,728	21,280	59,480	656,023
$10,000-19,000	204,447	226,095	79,688	51,966	36,675	80,465	30,009	76,698	45,431	37,758	78,999	948,231
$20,000-29,000	216,109	250,672	83,852	59,604	32,391	63,761	29,177	72,492	46,942	35,626	78,474	969,100
$30,000-39,000	205,532	245,472	77,689	61,986	31,631	51,096	27,524	63,892	42,800	33,197	71,088	911,907
$40,000-49,000	183,146	224,732	72,172	59,266	26,660	40,115	22,787	55,324	37,387	28,395	59,405	809,389
$50,000-59,000	167,201	204,109	66,111	52,756	21,507	33,354	21,249	46,434	33,172	24,844	52,175	722,912
$60,000-75,000	211,284	262,449	81,368	71,147	24,425	39,228	25,886	55,307	36,386	32,888	62,374	902,742
$75,000 or more	881,935	998,125	268,258	291,874	62,348	96,636	81,251	156,008	108,211	103,588	170,746	3,218,980

Household Income (% of Total)	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
less than $10,000	6%	6%	7%	6%	10%	14%	8%	9%	8%	7%	9%	7%
$10,000 - 19,000	9%	9%	10%	8%	14%	17%	12%	13%	12%	12%	12%	10%
$20,000- 29,000	10%	10%	11%	9%	12%	14%	11%	13%	12%	11%	12%	11%
$30,000 - 39,000	9%	10%	10%	9%	12%	11%	11%	11%	11%	10%	11%	10%
$40,000- 49,000	8%	9%	9%	9%	10%	9%	9%	10%	10%	9%	9%	9%
$50,000- 55,000	8%	8%	8%	8%	8%	7%	8%	8%	9%	8%	8%	8%
$60,000- 75,000	10%	10%	10%	10%	9%	8%	10%	10%	10%	10%	10%	10%
$75,000 or more	40%	39%	34%	42%	24%	21%	31%	27%	28%	33%	27%	35%



Poverty

Poverty Status %	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
Below Poverty Level:	14.1	13.1	15.1	12.4	21.6	30.5	17.1	17.4	16.2	14.0	18.1	15.5
At or Above Poverty Level:	85.9	86.9	84.9	87.6	78.4	69.5	82.9	82.6	83.8	86.0	81.9	84.5

Social Services

Public Assistance Status	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
Households on Public assistance: Cash or SNAP/ Food Stamps	12.4%	11.7%	14.3%	9.4%	24.1%	31.5%	15.8%	15.8%	13.8%	12.5%	13.1%	13.9%
Households Not on Public Assistance	87.6%	88.3%	85.7%	90.6%	75.9%	68.5%	84.2%	84.2%	86.2%	87.5%	86.9%	86.1%

Sociodemographics

Age

Age of Householder (%)	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
15 to 24 years	4.0	4.5	4.4	5.9	4.6	3.2	5.5	4.6	7.4	5.2	8.8	4.9
25 to 34 years	18.5	18.3	17.3	21.4	17.2	16.3	15.8	14.4	16.7	16.2	16.1	17.8
35 to 44 years	21.6	21.1	19.1	22.4	20.5	22.6	16.5	16.1	16.5	15.9	15.7	20.0
45 to 54 years	21.4	21.6	20.6	19.7	20.2	20.0	18.8	18.8	18.0	18.0	17.6	20.4
55 to 59 years	9.8	9.3	9.3	8.5	9.7	8.9	10.1	10.2	9.6	9.7	9.1	9.5
60 to 64 years	8.2	7.7	8.6	7.6	7.5	7.8	8.9	9.2	8.3	9.2	8.5	8.1
65 to 74 years	10.1	10.5	11.9	8.9	11.1	11.7	13.6	14.7	12.5	13.7	13.5	11.2
75 to 84 years	4.6	5.1	6.4	4.1	6.9	7.2	8.1	8.9	8.0	8.9	8.0	6.0
85 years and over	1.7	1.9	2.4	1.6	2.3	2.4	2.7	3.2	3.0	3.4	2.9	2.2

Ethnicity

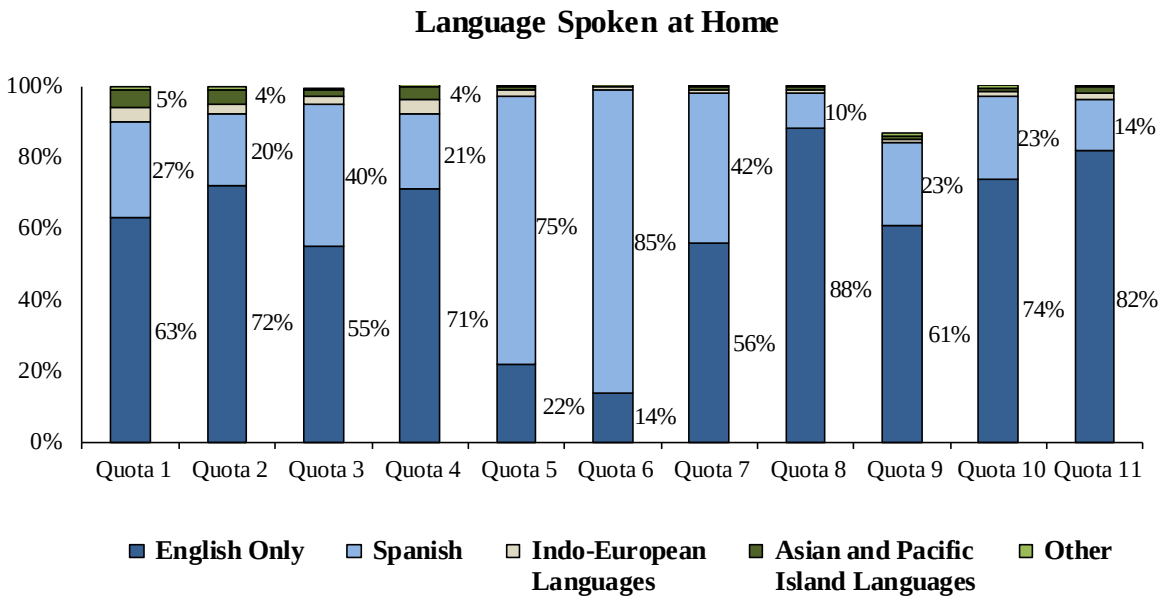
Race/Ethnicity (% of Total)	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
White alone	38.5	50.4	35.2	53.6	13.4	7.6	36.8	63.9	57.3	47.2	61.7	43.9
Black or African American alone	16.8	14.3	6.3	7.0	3.1	0.4	4.1	18.4	5.6	3.4	13.0	11.6
American Indian and Alaska Native alone	0.2	0.3	0.2	0.2	0.3	0.1	0.2	0.3	0.4	0.3	0.3	0.2
Asian alone	7.0	5.6	2.2	5.1	1.0	0.8	1.4	1.3	1.7	0.8	1.8	4.2
Native Hawaiian and Other Pacific Islander alone	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1
Some other race alone	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Two or more races	1.4	1.9	1.6	2.0	0.8	0.2	0.9	1.3	1.5	1.0	1.9	1.5
Hispanic or Latino	35.9	27.2	54.5	31.9	81.3	91.0	56.5	14.6	33.4	47.1	21.0	38.4

Gender

Gender (%)	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
Male Householder	53.8	52.6	51.7	52.6	50.9	46.9	49.6	50.(	51.1	51.9	51.7	52.1
Female Householder	46.2	47.4	48.3	47.4	49.1	53.1	50.4	50.(	48.9	48.1	48.3	47.9

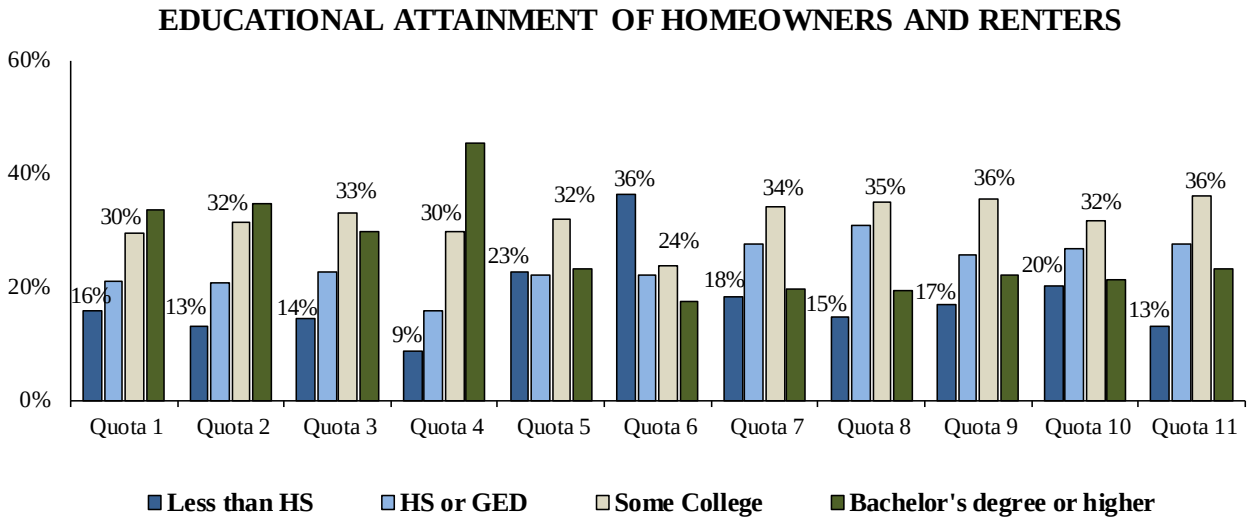
Language

Language Spoken at Home (%)	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11	State
English Only	63.2	72.3	55.6	71.0	21.7	13.6	55.6	87.6	74.1	61.3	82.0	65.0
Spanish	26.9	19.6	39.7	21.4	75.1	85.1	41.7	10.1	23.1	36.1	13.7	28.5
Indo-European Languages	3.9	3.2	2.2	3.5	1.6	0.5	1.3	1.2	1.1	1.5	2.2	2.7
Asian and Pacific Island Languages	4.7	3.6	1.9	3.5	1.2	0.7	1.2	1.0	1.3	0.8	1.7	3.0
Other	1.3	1.3	0.5	0.7	0.3	0.1	0.2	0.2	0.4	0.3	0.4	0.8



Education

Educational Attainment of Homeowners and Renters	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Region 11
Less than HS	15.7%	13.2%	14.4%	8.8%	22.6%	36.3%	18.4%	14.7%	16.8%	20.1%	13.2%
HS or GED	21.1%	20.7%	22.8%	15.9%	22.1%	22.1%	27.6%	30.9%	25.6%	26.7%	27.6%
Some College	29.5%	31.5%	33.2%	29.9%	32.1%	23.9%	34.3%	34.9%	35.5%	31.8%	36.0%
Bachelor's degree or higher	33.7%	34.6%	29.7%	45.4%	23.2%	17.6%	19.7%	19.5%	22.1%	21.3%	23.3%



ACS County Population Tables

Region 1. Houston Metropolitan

County	Population	County	Population
Austin	21,745	Harris	3,164,723
Brazoria	241,792	Liberty	58,086
Chambers	26,875	Matagorda	27,143
Colorado	15,953	Montgomery	366,757
Fort Bend	471,764	Waller	34,860
Galveston	231,139	Wharton	30,489

Source: ACS Table B25206

Region 2. Dallas/Fort-Worth Metroplex

County	Population	County	Population
Collin	862,215	Kaufman	109,289
Cooke	38,761	Navarro	48,118
Dallas	2,485,003	Palo Pinto	27,921
Denton	731,851	Parker	121,418
Ellis	157,058	Rains	11,037
Fannin	33,748	Rockwall	85,536
Grayson	122,780	Somervell	8,608
Henderson	79,016	Tarrant	1,914,526
Hood	53,171	Van Zandt	52,736
Hunt	88,052	Wise	61,243
Johnson	155,450		

Source: ACS Table B25206

Region 3. San Antonio Area

County	Population
Bexar	1,825,502
Guadalupe	143,460
Comal	119,632
Medina	47,392
Atascosa	47,050
Wilson	45,509
Kendall	37,361
Bandera	20,796
Gonzales	20,172

Source: ACS Table B25206

Region 4. Capital Area

County	Population
Travis	1,121,645
Williamson	473,592
Hays	177,562
Bastrop	76,948
Caldwell	39,347

Source: ACS Table B25206

Region 5. West Texas

County	Population
El Paso	831,095
Hudspeth	3,330

Source: ACS Table B25206

Region 6. Southwest Texas

County	Population	Occupied Units
Brooks	7,221	3,056
Cameron	417,947	145,194
Dimmit	10,682	4,353
Duval	11,577	5,533
Hidalgo	819,217	258,126
Jim Hogg	5,239	2,519
Kennedy	565	247
La Salle	7,191	2,923
Maverick	56,548	454
McMullen	778	17,929
Starr	62,648	19,590
Willacy	22,002	76,731
Zapata	14,308	7,102

Source: ACS Table B25206

Region 7. Corpus Christi Metropolitan

County	Population	Households	County	Population	Households
Aransas	24,292	15,614	Karnes	14,879	5,773
Bee	32,659	10,651	Kleberg	32,029	12,995
Calhoun	21,666	11,606	Live Oak	11,873	6,097
DeWitt	20,540	9,181	Nueces	352,060	144,416
Goliad	7,410	3,719	Refugio	7,277	3,727
Jackson	14,486	6,591	San Patricio	66,070	26,880
Jim Wells	41,461	16,206	Victoria	90,099	35,876
Total	736,801	309,332			

Source: ACS Table B25206

Region 8. East Texas

County	Population	Households	County	Population	Households
Angelina	87,748	36,070	Morris	12,700	6,019
Bowie	93,155	39,008	Nacogdoches	65,531	27,858
Camp	12,516	5,675	Newton	14,231	7,147
Cass	30,328	14,400	Orange	83,217	35,952
Cherokee	51,167	20,956	Panola	23,900	10,968
Delta	52,23	2,468	Red River	12,567	6,848
Franklin	10,599	5,779	Rusk	53,457	21,281
Gregg	12,3178	50,785	Sabine	10,440	8,008
Hardin	55,375	23,244	San Augustine	8,695	5,348
Harrison	66,417	27,954	Shelby	25,725	11,902
Hopkins	35,645	15,142	Smith	217,552	88,145
Jasper	35,768	16,868	Titus	32,553	12,070
Jefferson	25,2872	106,857	Tyler	21,462	10,596
Lamar	49,566	22,558	Upshur	40,096	16,709
Marion	10,248	6,236	Wood	42,712	20,928
Total	1,584,643	683,779			

Source: ACS Table B25206

Region 9. Texas Panhandle

County	Population	Households	County	Population	Households
Archer	8,779	4,129	Hockley	23,322	9,290
Armstrong	1,943	933	Hutchinson	21,858	10,585
Bailey	7,126	2,787	Jack	8,946	4,101
Baylor	3,628	2,695	Kent	821	539
Briscoe	1,670	985	King	267	159
Carson	6,068	2,771	Knox	3,796	2,041
Castro	7,948	3,178	Lamb	13,742	6,103
Childress	7,059	3,076	Lipscomb	3,483	1,454
Clay	10,479	5,136	Lubbock	290,782	119,565
Cochran	2,993	1,363	Lynn	5,764	2,668
Collingsworth	3,058	1,476	Montague	19,478	10,140
Cottle	1,510	963	Moore	22,281	7,951
Crosby	6,007	2,900	Motley	1,071	745
Dallam	7,014	2,880	Ochiltree	10,642	4,049
Deaf Smith	19,245	7,064	Oldham	2,071	835
Dickens	2,281	1,423	Parmer	10,004	3,807
Donley	3,588	2,136	Potter	122,352	48,557
Floyd	6,178	2,999	Randall	126,782	52,988
Foard	1,197	821	Roberts	931	404
Garza	6,410	2,040	Sherman	3,066	1,279
Gray	22,983	10,115	Stonewall	1,414	917
Hale	35,504	13,507	Swisher	7,713	3,217
Hall	3,203	1,934	Terry	12,687	4,868
Hansford	5,559	2,333	Throckmorton	1,545	1,048
Hardeman	3,992	2,395	Wheeler	5,618	2,709
Hartley	6,121	1,976	Wichita	131,957	55,897
Haskell	5,853	3,434	Wilbarger	13,158	6,280
Hemphill	4,115	1,725	Yoakum	8,213	2,993
Total	1,075,275	454,363			

Region 10. West Central Texas

County	Population	Households	County	Population	Households
Andrews	16,775	6,013	Martin	5,252	1,886
Borden	705	397	Mason	4,066	2,752
Brewster	9,235	5,419	Menard	2,182	1,725
Coke	3,238	2,667	Midland	151,290	56,735
Coleman	8,536	5,526	Mitchell	9,169	4,055
Concho	4,086	1,626	Nolan	15,061	7,123
Crane	4,730	1,652	Pecos	15,807	5,592
Crockett	3,699	1,753	Presidio	7,304	3,952
Culberson	2,296	1,020	Reagan	3,598	1,419
Dawson	13,542	5,209	Real	3,356	2,725
Ector	149,557	55,357	Reeves	14,179	4,631
Edwards	1,906	1,713	Runnels	10,445	5,268
Fisher	3,858	2,166	San Saba	5,893	3,172
Frio	18,168	5,872	Schleicher	3,224	1,492
Gaines	18,916	6,340	Scurry	17,238	7,137
Gillespie	25,398	12,868	Sterling	1,346	597
Glasscock	1,180	557	Sutton	3,966	2,027
Howard	36,105	13,116	Terrell	921	814
Irion	1,644	873	Tom Green	115,056	47,367
Jeff Davis	2,232	1,611	Upton	3,405	1,514
Kerr	50,149	23,977	Uvalde	26,952	10,955
Kimble	4,486	3,351	Val Verde	48,980	18,738
Kinney	3,577	1,734	Ward	11,225	4,723
Llano	19,323	14,665	Winkler	7,576	3,006
Loving	117	73	Zavala	12,060	4,297
McCulloch	8,273	4,284	Total	911,282	383,541

Region 11. Waco Area

County	Population	Households	County	Population	Households
Anderson	57,915	20,134	Jones	19,978	7,330
Bell	326,041	131,684	Lampasas	20,219	8,892
Blanco	10,723	5,622	Lavaca	19,549	10,368
Bosque	17,971	9,641	Lee	16,664	7,569
Brazos	205,271	81,916	Leon	16,819	9,522
Brown	37,833	18,419	Limestone	23,454	10,551
Burleson	17,293	8,875	McLennan	241,505	96,935
Burnet	44,144	21,338	Madison	13,838	5,162
Callahan	13,532	6,574	Milam	24,344	11,324
Comanche	13,623	7,242	Mills	4,875	2,845
Coryell	76,128	25,847	Polk	46,113	23,624
Eastland	18,328	10,259	Robertson	16,532	8,507
Erath	40,039	17,251	San Jacinto	27,023	13,136
Falls	17,410	7,725	Shackelford	3,352	1,757
Fayette	24,849	13,854	Stephens	9,452	4,925
Freestone	19,586	9,286	Taylor	134,435	56,492
Grimes	26,961	10,947	Trinity	14,405	8,733
Hamilton	8,266	4,562	Walker	69,330	24,844
Hill	34,923	16,134	Washington	34,236	15,667
Houston	22,949	11,543	Young	18,329	8,634
Total	1,808,237	775,670			

Energy Poverty Variable Methodology

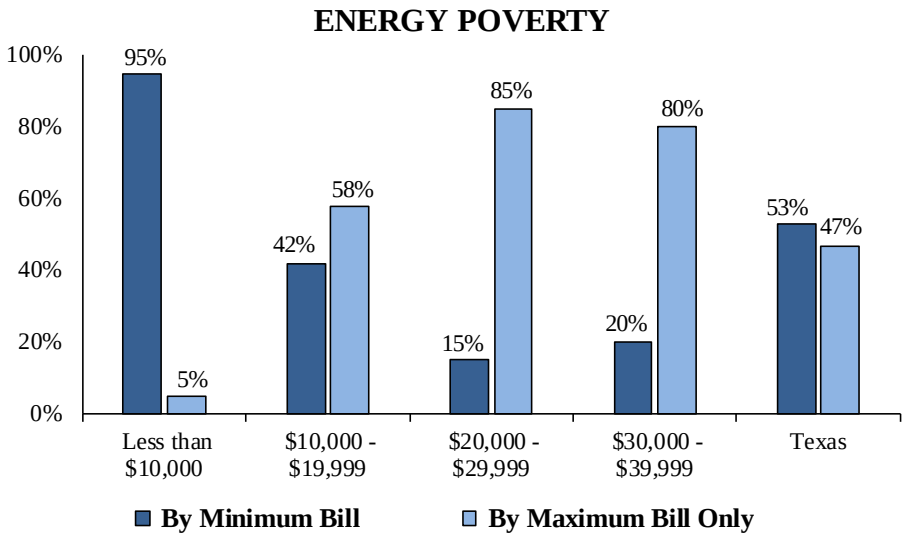
One of the goals of this study was to determine the rate of energy poverty among our low-income survey respondents in Texas. In the United States, energy poverty is when a household spends ten percent or more of their income on energy costs, although energy is seen as unaffordable if it is above six percent of income (Fisher, Sheehan and Colton). To determine a household's energy burden, the energy bill for the period examined is divided by the resident's income for that period. Our survey gathered income in ranges and asked for the average energy bill for each season, which allows for determining the energy burden in several different ways. Since researchers did not ask respondents for an exact yearly income, the midpoint of the income range for the respondent's income was used. Researchers then looked at energy burden based on the maximum energy bill divided by monthly income (the midpoint divided by 12) and by the average energy bill divided by the midpoint yearly income. The rationale behind examining maximum energy bill by monthly income in addition to the full year is that certain periods are more strenuous for energy requirements and costs than others are. Taking an average would hide people who may be able to handle their energy costs in milder seasons but see increased costs in the summer or winter. As the literature notes that an energy burden above six percent is above an "affordable burden," it is useful to examine energy burdens above that point. Researchers reserve the term "energy poverty" for respondents whose energy burden was above ten percent of their income. While researchers have included all four metrics to give a broad idea of the prevalence of energy poverty and energy burdens within Texas, the max energy bill at a ten percent threshold for segmentation purposes was used.

Researchers also determined energy poverty by minimum seasonal energy bill instead of the maximum energy bill. These shows the respondents who are were in energy poverty in every season and who, therefore, experience the most energy poverty. Of our respondents, 13%, or 259 households, were in energy poverty in every season. These respondents are the most vulnerable and suffer chronically from energy poverty.

It should be noted that this is not a perfect gauge of energy poverty, as researchers do not have exact incomes and only use electricity bills that may fail to include heating costs that may understate the level of energy poverty in parts of the state.

	Number in Energy Poverty	Percentage in Energy Poverty
Max energy bill at 10% threshold	476	24%
Yearly average at 10% threshold	333	16%
Max energy bill at 6% threshold	905	45%
Yearly average at 6% threshold	644	32%

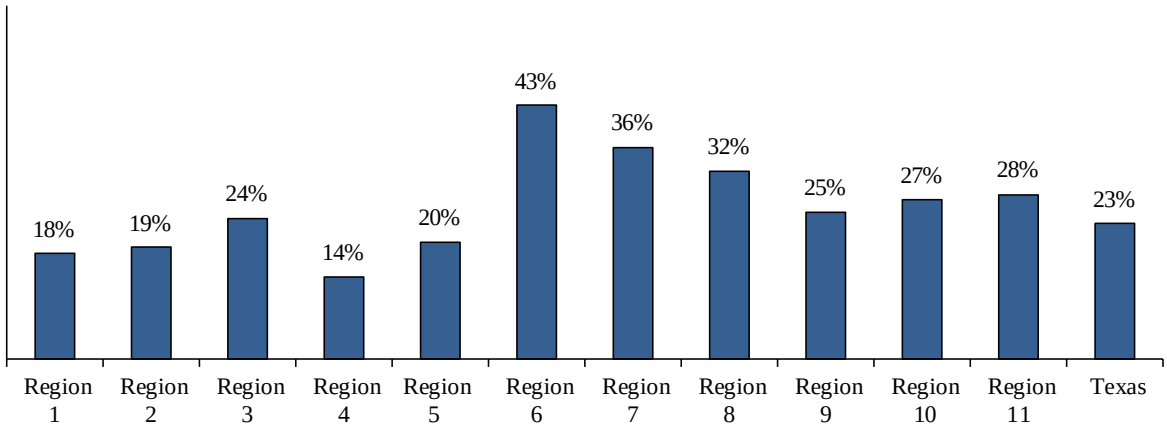
Income Level	Number in Energy Poverty. by Maximum Bill	Number in Energy Poverty. by Minimum Bill Only
Less than $10,000	178	169
$10,000 - $19,999	166	70
$20,000 - $29,999	93	14
$30,000 - $39,999	29	6
$40,000 - $49,999	10	0
$50,000 - $59,999	0	0
$60,000 - $74,999	0	0
Texas	476	259



This graph and the table preceding it shows the breakdown of people who are in energy poverty from their maximum seasonal bill versus those who are in energy poverty all year. Of the respondents, 95% of people who make less than $10,000 who are in energy poverty are in energy poverty year-round, and 42% who make between $10,000 to $20,000 are in year-round energy poverty. Of the remaining respondents, 15% of people in the $20,000 to $30,000 range were in year-round energy poverty, 20% in the $30,000 to $40,000 range were in year-round energy poverty, while none of the people in the $40,000 to $50,000 range was in year-round energy poverty.

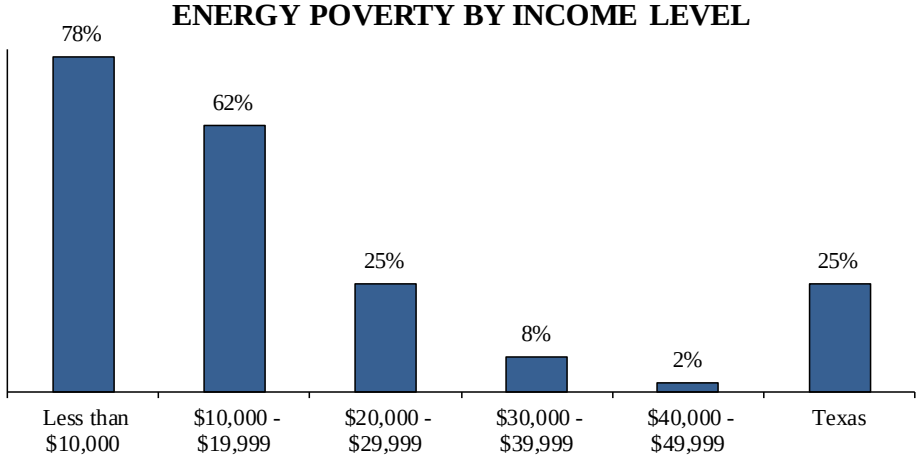
Below is the breakdown of respondents in energy poverty from their maximum bill broken down by demographics.

RESIDENTS IN ENERGY POVERTY

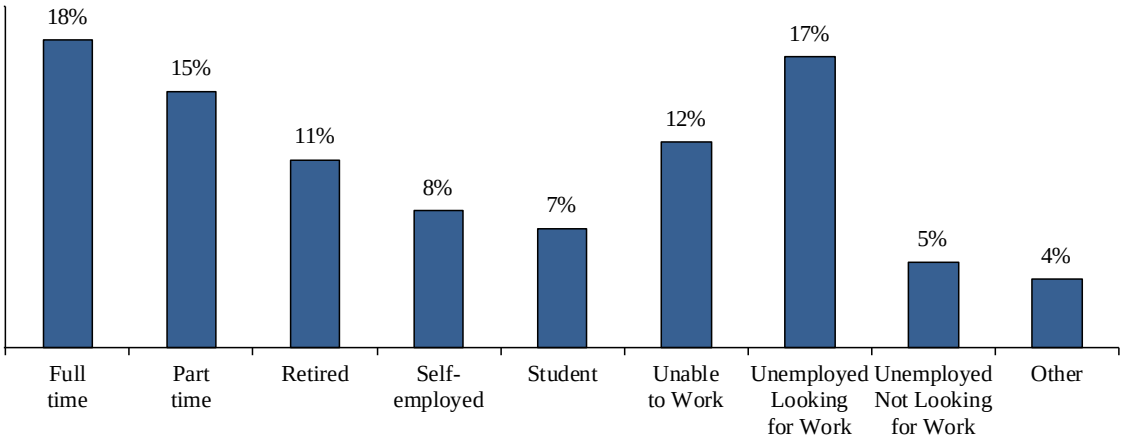


Energy poverty is highest in areas that are more rural. Regions 1 through 5 represent Houston, DFW, San Antonio, Austin, and El Paso and have energy poverty rates at or below the statewide average. The more rural regions, especially Region 6 that represents the Rio Grande Valley, have energy poverty rates that are generally higher than the statewide average.

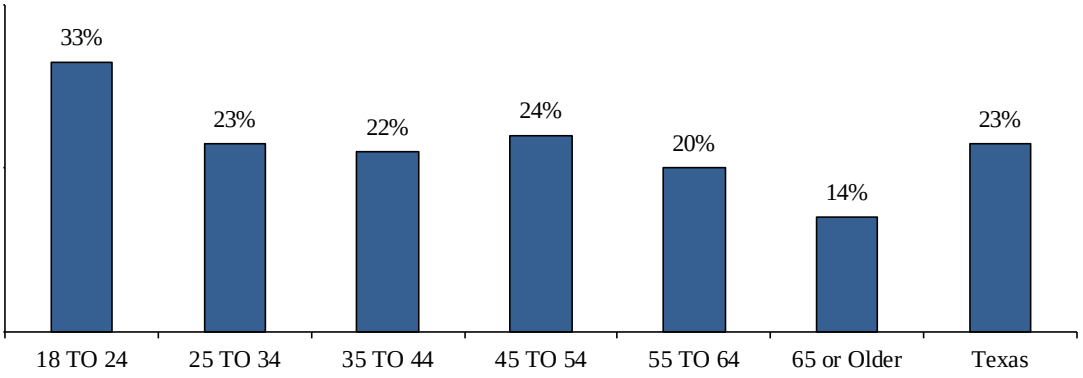
ENERGY POVERTY BY INCOME LEVEL



ENERGY POVERTY BY EMPLOYMENT STATUS



ENERGY POVERTY BY AGE RANGE



Appendix C. Survey Responses

Table C1. Age Range of Respondents

Region	18 to 24 years	25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	Age 65 or older
1-Houston Metropolitan	14%	30%	21%	10%	14%	12%
2-Dallas/Fort-Worth Metroplex	14%	17%	16%	16%	20%	16%
3-San Antonio Area	17%	27%	16%	12%	17%	10%
4-Captial Area	15%	24%	24%	13%	15%	10%
5-West Texas	12%	35%	25%	9%	15%	4%
6-Southwest Texas	30%	29%	16%	7%	13%	4%
7-Corpus Christi Metropolitan	21%	21%	24%	12%	15%	9%
8-East Texas	12%	24%	11%	19%	23%	11%
9-Texas Panhandle	11%	30%	24%	15%	13%	8%
10-West/Central Texas	17%	28%	16%	12%	17%	10%
11-Waco Area	18%	28%	16%	19%	12%	7%
Texas	**15%**	**26%**	**19%**	**13%**	**16%**	**11%**

Table C2. Income Level of Respondents

Region	Less than $10,000	$10,000-$19,999	$20,000-$29,999	$30,000-$39,999	$40,000-$49,999	$50,000-$59,999	$60,000-$74,999
1-Houston Metropolitan	7%	11%	17%	17%	14%	18%	15%
2-Dallas/Fort-Worth Metroplex	11%	12%	16%	17%	16%	18%	10%
3-San Antonio Area	9%	15%	20%	16%	11%	14%	15%
4-Captial Area	9%	6%	16%	22%	18%	14%	15%
5-West Texas	10%	18%	18%	19%	10%	13%	12%
6-Southwest Texas	21%	21%	15%	12%	8%	16%	6%
7-Corpus Christi Metropolitan	28%	9%	19%	12%	7%	16%	9%
8-East Texas	9%	22%	22%	16%	13%	9%	8%
9-Texas Panhandle	12%	12%	18%	16%	16%	19%	7%
10-West/Central Texas	14%	19%	18%	14%	9%	13%	13%
11-Waco Area	9%	13%	18%	13%	12%	19%	16%
Texas	**11%**	**13%**	**18%**	**16%**	**13%**	**16%**	**12%**

Table C3. Respondents Making Household Energy Management Decisions

Region	Yes	No	I don't know
1-Houston Metropolitan	82%	15%	3%
2-Dallas/Fort-Worth Metroplex	79%	18%	4%
3-San Antonio Area	82%	14%	4%
4-Captial Area	82%	14%	4%
5-West Texas	81%	18%	1%
6-Southwest Texas	79%	18%	3%
7-Corpus Christi Metropolitan	76%	19%	4%
8-East Texas	79%	20%	1%
9-Texas Panhandle	84%	13%	3%
10-West/Central Texas	78%	14%	8%
11-Waco Area	78%	16%	6%
Texas	**80%**	**16%**	**4%**

Table C4. Number of Occupants in Household

Region	1	2	3	4	5	6	7	8
1-Houston Metropolitan	23%	25%	19%	15%	11%	3%	3%	1%
2-Dallas/Fort-Worth Metroplex	26%	34%	19%	11%	5%	3%	1%	1%
3-San Antonio Area	23%	22%	22%	16%	10%	4%	2%	
4-Captial Area	26%	31%	21%	13%	4%	2%		1%
5-West Texas	18%	31%	15%	19%	12%	3%	1%	
6-Southwest Texas	11%	22%	23%	23%	7%	7%	2%	3%
7-Corpus Christi Metropolitan	15%	38%	18%	13%	10%	4%		
8-East Texas	19%	35%	20%	13%	8%	3%	2%	
9-Texas Panhandle	22%	29%	21%	13%	9%	4%	2%	1%
10-West/Central Texas	19%	29%	21%	16%	8%	4%	1%	1%
11-Waco Area	18%	29%	25%	21%	4%	1%	1%	
Texas	**22%**	**29%**	**20%**	**15%**	**8%**	**3%**	**2%**	**1%**

Table C5. Percentage of Household Members over the Age of 18

Region	1	2	3	4	5	6
1-Houston Metropolitan	8%	62%	16%	8%	5%	
2-Dallas/Fort-Worth Metroplex	7%	65%	18%	6%	2%	1%
3-San Antonio Area	9%	57%	22%	8%	2%	
4-Captial Area	6%	70%	16%	6%	1%	
5-West Texas	9%	70%	16%	5%		
6-Southwest Texas	5%	59%	16%	8%	5%	3%
7-Corpus Christi Metropolitan	7%	64%	16%	10%	3%	
8-East Texas	9%	65%	20%	4%	3%	
9-Texas Panhandle	9%	65%	18%	5%	1%	2%
10-West/Central Texas	8%	66%	14%	8%	1%	2%
11-Waco Area	5%	70%	20%	4%	2%	
Texas	**8%**	**64%**	**17%**	**7%**	**2%**	**1%**

Table C6. Percentage of Household Members under the Age of 18

Region	0	1	2	3	4	5
1-Houston Metropolitan	47%	24%	15%	9%	3%	1%
2-Dallas/Fort-Worth Metroplex	58%	21%	16%	3%	2%	
3-San Antonio Area	42%	25%	21%	7%	3%	2%
4-Captial Area	58%	22%	10%	5%	4%	1%
5-West Texas	39%	23%	23%	9%	2%	4%
6-Southwest Texas	42%	21%	21%	7%	6%	1%
7-Corpus Christi Metropolitan	57%	21%	16%	5%	2%	
8-East Texas	53%	18%	20%	5%	1%	3%
9-Texas Panhandle	48%	24%	15%	10%	3%	
10-West/Central Texas	47%	23%	19%	6%	4%	1%
11-Waco Area	50%	21%	25%		4%	
Texas	**50%**	**23%**	**17%**	**6%**	**3%**	**1%**

Table C7. Percentage of Adults in the Household over the Age of 65

Region	0	1	2
1-Houston Metropolitan	77%	12%	9%
2-Dallas/Fort-Worth Metroplex	72%	17%	11%
3-San Antonio Area	84%	10%	6%
4-Captial Area	83%	11%	6%
5-West Texas	84%	13%	4%
6-Southwest Texas	77%	9%	12%
7-Corpus Christi Metropolitan	76%	12%	12%
8-East Texas	75%	16%	9%
9-Texas Panhandle	88%	9%	3%
10-West/Central Texas	80%	13%	7%
11-Waco Area	80%	14%	5%
Texas	79%	13%	8%

Table C8. Type of Relationship and Number of Other Adults in the Household

Region	Spouse	Partner	Boyfriend/ Girlfriend	Brother/ sister	2	3	Brother/ sister-in-law	Friend(s)	2	Adult son /daughter	2	Son-in-law/ daughter-in-law	Adult grandchild	Cousin	Parent/ guardian	2	Step-parent	Aunt/uncle	Grandparent	Other
1-Houston Metropolitan	52%	9%	8%	8%	3%	1%	2%	2%		14%	4%	2%	1%	1%	9%	9%	1%	1%	3%	5%
2-Dallas/Fort-Worth Metroplex	51%	5%	5%	8%	4%	2%	1%	2%		12%	1%	2%	1%	1%	12%	8%	1%	1%	2%	5%
3-San Antonio Area	48%	9%	11%	11%	3%	1%	3%	4%	2%	12%	4%	2%			10%	6%	3%		2%	8%
4-Captial Area	48%	10%	9%	5%	1%	1%		4%	1%	11%	3%			1%	11%	4%	1%			5%
5-West Texas	59%	7%	5%	7%	4%			4%		9%	4%	4%			7%	9%			2%	5%
6-Southwest Texas	45%	13%	8%	8%	5%	3%	5%	1%		5%	6%	2%			19%	12%	2%		2%	6%
7-Corpus Christi Metropolitan	57%	3%	7%	3%	3%		3%	3%		9%	7%	3%	2%		4%	5%		3%	2%	2%
8-East Texas	55%	4%	8%	6%	1%		4%	1%		18%		1%	1%		8%	6%			1%	8%
9-Texas Panhandle	63%	5%	9%	3%	2%		1%	2%		13%	1%	2%		1%	10%	6%	1%	1%	3%	3%
10-West/Central Texas	54%	7%	10%	1%	2%	1%		2%	1%	7%	3%	1%	2%	1%	14%	4%	3%	1%	1%	6%
11-Waco Area	55%	11%	5%	2%	2%		2%	4%		13%	4%	5%			16%	4%	4%			2%
Texas	**52%**	**8%**	**8%**	**6%**	**3%**	**1%**	**2%**	**3%**	**1%**	**12%**	**3%**	**2%**	**1%**	**1%**	**11%**	**7%**	**1%**	**1%**	**2%**	**5%**

Table C9. Age Range of Minors in each Household

Region	1 age 0-2 years	2 age 0-2 yrs	1 age 3-5 years	2 age 3-5 yrs	1 age 6-8 years	2 age 6-8 yrs	1 age 9-11 years	2 age 9-11 yrs	1 age 12-14 years	2 age 12-14 yrs	1 age 15-18 years	2 age 15-18 yrs
1-Houston Metropolitan	27%	3%	27%	5%	19%	3%	21%	4%	19%	5%	21%	5%
2-Dallas/Fort-Worth Metroplex	16%	8%	20%	2%	21%	3%	20%	6%	21%	1%	25%	3%
3-San Antonio Area	33%	5%	23%	4%	24%	3%	24%	3%	20%	4%	22%	3%
4-Captial Area	28%	7%	18%	5%	26%		23%		15%	7%	23%	5%
5-West Texas	25%		28%	3%	41%	3%	41%	3%	28%		9%	3%
6-Southwest Texas	30%	9%	19%	9%	32%		19%	9%	21%	2%	18%	
7-Corpus Christi Metropolitan	25%	4%	21%	8%	13%		13%		25%	8%	22%	4%
8-East Texas	31%	3%	37%		25%	11%	22%	3%	19%		14%	3%
9-Texas Panhandle	29%	5%	41%	3%	23%	3%	17%	5%	16%	2%	17%	6%
10-West/Central Texas	42%	8%	24%	1%	16%	3%	24%		17%	2%	16%	6%
11-Waco Area	33%	7%	19%	7%	19%		8%		12%	4%	11%	7%
Texas	**29%**	**5%**	**25%**	**4%**	**22%**	**3%**	**21%**	**3%**	**19%**	**3%**	**20%**	**4%**

Table C10. Average Length of Residence at Current Address

Region	Less than a year	1 - 3 years	3 - 6 years	6 - 9 years	More than 10 years
1-Houston Metropolitan	44%	15%	10%	32%	44%
2-Dallas/Fort-Worth Metroplex	39%	13%	11%	37%	39%
3-San Antonio Area	46%	15%	9%	29%	46%
4-Captial Area	45%	18%	11%	25%	45%
5-West Texas	47%	16%	5%	33%	47%
6-Southwest Texas	34%	17%	11%	38%	34%
7-Corpus Christi Metropolitan	49%	10%	4%	36%	49%
8-East Texas	37%	17%	6%	39%	37%
9-Texas Panhandle	43%	24%	7%	25%	43%
10-West/Central Texas	42%	20%	11%	27%	42%
11-Waco Area	49%	12%	13%	25%	49%
Texas	**43%**	**16%**	**10%**	**31%**	**43%**

Table C11. Type of Home where Respondents Live

Region	House	Apartment or Condominium	Mobile Home	Duplex	Townhouse
1-Houston Metropolitan	59%	33%	7%		1%
2-Dallas/Fort-Worth Metroplex	59%	32%	8%		
3-San Antonio Area	53%	26%	8%	3%	3%
4-Captial Area	49%	41%	7%	1%	1%
5-West Texas	66%	29%	1%	1%	1%
6-Southwest Texas	71%	19%	10%		
7-Corpus Christi Metropolitan	66%	22%	9%	1%	1%
8-East Texas	62%	13%	22%	1%	
9-Texas Panhandle	67%	21%	8%	1%	
10-West/Central Texas	69%	17%	12%		
11-Waco Area	65%	24%	12%		
Texas	**60%**	**28%**	**9%**	**1%**	**1%**

Table C12. Percentage of Respondents who Own or Rent their Home

Region	Own	Rent	Other
1-Houston Metropolitan	49%	49%	3%
2-Dallas/Fort-Worth Metroplex	52%	45%	3%
3-San Antonio Area	45%	51%	4%
4-Captial Area	43%	54%	2%
5-West Texas	49%	49%	3%
6-Southwest Texas	57%	39%	4%
7-Corpus Christi Metropolitan	51%	44%	4%
8-East Texas	57%	41%	2%
9-Texas Panhandle	54%	44%	2%
10-West/Central Texas	56%	39%	5%
11-Waco Area	44%	51%	4%
Texas	**50%**	**47%**	**3%**

Table C13. Percentage of Respondents who own and have financed their Home

Region	Yes	No
1-Houston Metropolitan	62%	38%
2-Dallas/Fort-Worth Metroplex	53%	48%
3-San Antonio Area	56%	44%
4-Captial Area	61%	39%
5-West Texas	52%	48%
6-Southwest Texas	42%	58%
7-Corpus Christi Metropolitan	43%	57%
8-East Texas	40%	60%
9-Texas Panhandle	45%	55%
10-West/Central Texas	45%	55%
11-Waco Area	60%	40%
Texas	**53%**	**47%**

Table C14. How Respondent Home is Financed

Region	Mortgage	Loan
1-Houston Metropolitan	91%	9%
2-Dallas/Fort-Worth Metroplex	93%	7%
3-San Antonio Area	91%	9%
4-Captial Area	98%	2%
5-West Texas	76%	24%
6-Southwest Texas	91%	9%
7-Corpus Christi Metropolitan	87%	13%
8-East Texas	95%	5%
9-Texas Panhandle	100%	
10-West/Central Texas	92%	8%
11-Waco Area	89%	11%
Texas	**92%**	**8%**

Table C15. Number of Units in the building for Apartment or Condominium Respondents

Region	1-5	15-20	5-10	More than 20
1-Houston Metropolitan	10%	13%	21%	56%
2-Dallas/Fort-Worth Metroplex	19%	13%	28%	40%
3-San Antonio Area	22%	16%	27%	34%
4-Captial Area	15%	20%	26%	40%
5-West Texas	30%	10%	35%	25%
6-Southwest Texas	44%	22%	17%	17%
7-Corpus Christi Metropolitan	47%	13%	7%	33%
8-East Texas	46%	15%	15%	23%
9-Texas Panhandle	23%	9%	20%	49%
10-West/Central Texas	26%	14%	17%	43%
11-Waco Area	56%	6%	6%	31%
Texas	**21%**	**14%**	**23%**	**41%**

Table C16. Number of Stories in Respondents Homes

Region	1	2
1-Houston Metropolitan	65%	35%
2-Dallas/Fort-Worth Metroplex	80%	20%
3-San Antonio Area	76%	24%
4-Captial Area	71%	27%
5-West Texas	82%	14%
6-Southwest Texas	84%	16%
7-Corpus Christi Metropolitan	100%	
8-East Texas	97%	3%
9-Texas Panhandle	92%	8%
10-West/Central Texas	90%	10%
11-Waco Area	82%	18%
Texas	**80%**	**19%**

Table C17. Average Square Footage of Respondents Homes

Region	Square Footage
1-Houston Metropolitan	2,213
2-Dallas/Fort-Worth Metroplex	5,492
3-San Antonio Area	2,189
4-Captial Area	1,484
5-West Texas	1,912
6-Southwest Texas	2,252
7-Corpus Christi Metropolitan	1,520
8-East Texas	1,880
9-Texas Panhandle	4,185
10-West/Central Texas	2,561
11-Waco Area	1,277
Texas	**2,888**

Table C18. How many Bedrooms are in your Home?

Region	1	2	3	4	5
1-Houston Metropolitan	18%	23%	38%	19%	3%
2-Dallas/Fort-Worth Metroplex	17%	24%	40%	16%	2%
3-San Antonio Area	18%	26%	41%	13%	2%
4-Captial Area	17%	31%	33%	16%	3%
5-West Texas	15%	28%	44%	13%	
6-Southwest Texas	8%	22%	42%	26%	2%
7-Corpus Christi Metropolitan	15%	32%	38%	15%	
8-East Texas	13%	27%	48%	9%	2%
9-Texas Panhandle	14%	24%	48%	12%	2%
10-West/Central Texas	12%	23%	48%	17%	
11-Waco Area	15%	36%	34%	13%	1%
Texas	**16%**	**25%**	**41%**	**16%**	**2%**

Table C19. Year Respondents Homes were Built

Region	1950 - 1959	1960 - 1969	1970 - 1979	1980 - 1989	1990 - 1999	2000 - 2009	2010 - 2014	2015 - 2018	Before 1950	I'm not sure
1-Houston Metropolitan	5%	7%	14%	19%	11%	17%	8%	3%	4%	12%
2-Dallas/Fort-Worth Metroplex	9%	8%	15%	16%	10%	16%	4%	4%	5%	14%
3-San Antonio Area	4%	8%	13%	13%	9%	17%	8%	5%	8%	14%
4-Captial Area	4%	5%	12%	11%	16%	25%	10%	5%	2%	12%
5-West Texas	12%	7%	13%	13%	12%	12%	7%	3%	4%	16%
6-Southwest Texas	3%	2%	7%	14%	15%	28%	7%	4%	5%	13%
7-Corpus Christi Metropolitan	12%	15%	9%	19%	12%	10%	4%		4%	15%
8-East Texas	6%	11%	15%	12%	9%	11%	4%	3%	12%	14%
9-Texas Panhandle	19%	15%	16%	10%	4%	5%	4%	5%	9%	13%
10-West/Central Texas	8%	13%	17%	12%	9%	12%	6%	3%	7%	13%
11-Waco Area	7%	9%	13%	7%	15%	18%	3%	1%	10%	16%
Texas	**7%**	**9%**	**14%**	**14%**	**11%**	**16%**	**6%**	**4%**	**6%**	**13%**

Table C20. Respondents Light Source during Daylight Hours

Region	Natural Lighting	Artificial Lighting
1-Houston Metropolitan	72%	28%
2-Dallas/Fort-Worth Metroplex	73%	27%
3-San Antonio Area	71%	29%
4-Captial Area	74%	26%
5-West Texas	84%	16%
6-Southwest Texas	62%	38%
7-Corpus Christi Metropolitan	69%	31%
8-East Texas	66%	34%
9-Texas Panhandle	75%	25%
10-West/Central Texas	72%	28%
11-Waco Area	65%	35%
Texas	**72%**	**28%**

Table C21. Respondents Type of Air Conditioning in the Home

Region	Central air conditioning	Window mounted air conditioner	No AC
1-Houston Metropolitan	90%	9%	1%
2-Dallas/Fort-Worth Metroplex	85%	14%	1%
3-San Antonio Area	79%	19%	1%
4-Captial Area	93%	7%	
5-West Texas	82%	16%	2%
6-Southwest Texas	77%	18%	5%
7-Corpus Christi Metropolitan	79%	21%	
8-East Texas	71%	29%	
9-Texas Panhandle	73%	25%	2%
10-West/Central Texas	69%	30%	2%
11-Waco Area	73%	24%	3%
Texas	**82%**	**17%**	**1%**

Table C22. Age of Respondents Home Air Conditioning System

Region	Brand New	1-5 years	6-10 years	11-15 years	15 years or more	I'm not sure
1-Houston Metropolitan	10%	35%	23%	8%	6%	17%
2-Dallas/Fort-Worth Metroplex	8%	38%	18%	8%	9%	20%
3-San Antonio Area	8%	41%	17%	6%	7%	21%
4-Captial Area	6%	37%	22%	10%	4%	21%
5-West Texas	3%	48%	16%	6%	3%	24%
6-Southwest Texas	14%	42%	18%	11%	3%	11%
7-Corpus Christi Metropolitan	7%	41%	13%	13%	9%	16%
8-East Texas	7%	34%	23%	10%	6%	20%
9-Texas Panhandle	11%	41%	18%	7%	4%	19%
10-West/Central Texas	8%	47%	17%	6%	6%	16%
11-Waco Area	8%	47%	15%	9%	6%	15%
Texas	**8%**	**40%**	**19%**	**8%**	**6%**	**19%**

Table C 23. Percentage of Respondents who have the Appliance in the Home

Region	Refrigerator	Electric Stove	Gas Stove	Dishwasher	Washer	Dryer	Television	Desktop Computer	Laptop	Ceiling Fan	Landline Telephone	Water Heater	Microwave	Other
1-Houston Metropolitan	98%	58%	41%	75%	77%	77%	95%	49%	73%	82%	33%	77%	92%	6%
2-Dallas/Fort-Worth Metroplex	97%	75%	22%	75%	80%	78%	94%	53%	70%	82%	35%	81%	94%	3%
3-San Antonio Area	100%	75%	23%	66%	80%	78%	96%	42%	68%	82%	31%	83%	96%	2%
4-Captial Area	99%	64%	36%	81%	83%	80%	95%	48%	78%	91%	28%	83%	94%	3%
5-West Texas	99%	32%	74%	56%	74%	69%	97%	35%	79%	87%	31%	91%	91%	1%
6-Southwest Texas	98%	67%	34%	29%	86%	79%	97%	36%	71%	79%	26%	80%	88%	4%
7-Corpus Christi Metropolitan	97%	66%	31%	53%	88%	87%	97%	46%	71%	88%	19%	82%	91%	
8-East Texas	100%	77%	19%	61%	86%	85%	98%	39%	72%	84%	32%	92%	99%	3%
9-Texas Panhandle	99%	63%	36%	68%	83%	85%	99%	44%	70%	87%	30%	90%	95%	5%
10-West/Central Texas	99%	68%	31%	52%	85%	84%	97%	46%	64%	85%	30%	89%	94%	3%
11-Waco Area	99%	59%	38%	57%	74%	75%	94%	46%	71%	71%	34%	84%	94%	
Texas	**98%**	**66%**	**32%**	**67%**	**81%**	**80%**	**96%**	**46%**	**71%**	**84%**	**31%**	**83%**	**94%**	**3%**

Table C24. Age of Refrigerator

Region	Less than 1 year old	1 - 5 years	5 - 10 years	10 - 15 years	15 years or more	I'm not sure
1-Houston Metropolitan	40%	9%	3%	23%	14%	11%
2-Dallas/Fort-Worth Metroplex	35%	10%	6%	22%	19%	8%
3-San Antonio Area	43%	9%	6%	20%	13%	9%
4-Captial Area	47%	11%	3%	14%	17%	7%
5-West Texas	54%	6%		21%	13%	6%
6-Southwest Texas	39%	6%	4%	26%	12%	13%
7-Corpus Christi Metropolitan	39%	8%	3%	21%	15%	14%
8-East Texas	37%	12%	7%	18%	14%	11%
9-Texas Panhandle	39%	7%	5%	22%	15%	12%
10-West/Central Texas	42%	7%	4%	27%	10%	10%
11-Waco Area	36%	7%	3%	22%	22%	9%
Texas	**41%**	**9%**	**4%**	**22%**	**15%**	**9%**

Table C25. Are there Large Cracks or Open Spaces in your Home Windows or Doors

Region	No	Yes
1-Houston Metropolitan	76%	24%
2-Dallas/Fort-Worth Metroplex	76%	24%
3-San Antonio Area	77%	23%
4-Captial Area	77%	23%
5-West Texas	74%	26%
6-Southwest Texas	68%	32%
7-Corpus Christi Metropolitan	65%	35%
8-East Texas	64%	36%
9-Texas Panhandle	65%	35%
10-West/Central Texas	74%	26%
11-Waco Area	81%	19%
Texas	**74%**	**26%**

Table C26. House is not Drafty at All

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	22%	28%	19%	22%	9%
2-Dallas/Fort-Worth Metroplex	18%	25%	22%	22%	13%
3-San Antonio Area	19%	24%	22%	20%	15%
4-Captial Area	21%	27%	18%	24%	10%
5-West Texas	15%	25%	26%	19%	15%
6-Southwest Texas	25%	22%	29%	16%	8%
7-Corpus Christi Metropolitan	21%	19%	28%	21%	12%
8-East Texas	11%	20%	25%	24%	20%
9-Texas Panhandle	18%	19%	30%	15%	18%
10-West/Central Texas	14%	24%	24%	21%	17%
11-Waco Area	24%	19%	28%	18%	12%
Texas	**19%**	**24%**	**23%**	**21%**	**13%**

Table C27. It is Hard to keep my House at a Comfortable Temperature

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	16%	25%	27%	10%	21%
2-Dallas/Fort-Worth Metroplex	17%	23%	26%	10%	24%
3-San Antonio Area	17%	23%	26%	7%	27%
4-Captial Area	18%	24%	27%	10%	20%
5-West Texas	16%	29%	28%	10%	16%
6-Southwest Texas	18%	26%	20%	8%	29%
7-Corpus Christi Metropolitan	15%	19%	28%	18%	19%
8-East Texas	11%	28%	24%	16%	21%
9-Texas Panhandle	18%	27%	24%	12%	20%
10-West/Central Texas	18%	21%	25%	9%	27%
11-Waco Area	16%	29%	21%	6%	28%
Texas	**17%**	**24%**	**26%**	**10%**	**23%**

Table C28. Disagreement over the Temperature Indoors is Common at my House

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	24%	20%	20%	14%	22%
2-Dallas/Fort-Worth Metroplex	22%	18%	18%	12%	29%
3-San Antonio Area	22%	24%	16%	7%	31%
4-Captial Area	22%	18%	16%	12%	32%
5-West Texas	24%	21%	19%	13%	24%
6-Southwest Texas	24%	28%	20%	12%	16%
7-Corpus Christi Metropolitan	24%	29%	13%	13%	21%
8-East Texas	19%	27%	12%	18%	25%
9-Texas Panhandle	27%	21%	19%	10%	22%
10-West/Central Texas	30%	20%	16%	9%	25%
11-Waco Area	19%	35%	12%	9%	25%
Texas	**24%**	**22%**	**17%**	**12%**	**26%**

Table C29. How many Rooms in your Home have a Ceiling Fan?

Region	1	2	3	More than 3
1-Houston Metropolitan	15%	24%	22%	40%
2-Dallas/Fort-Worth Metroplex	14%	20%	21%	44%
3-San Antonio Area	18%	20%	21%	41%
4-Captial Area	12%	23%	28%	38%
5-West Texas	19%	24%	20%	37%
6-Southwest Texas	14%	18%	29%	39%
7-Corpus Christi Metropolitan	12%	23%	15%	50%
8-East Texas	15%	21%	16%	48%
9-Texas Panhandle	15%	20%	16%	48%
10-West/Central Texas	11%	16%	25%	47%
11-Waco Area	13%	21%	25%	42%
Texas	**14%**	**21%**	**22%**	**43%**

Table C30. How often do you use a Ceiling Fan?

Region	Sometimes	Always	Never
1-Houston Metropolitan	52%	46%	3%
2-Dallas/Fort-Worth Metroplex	57%	39%	4%
3-San Antonio Area	48%	50%	1%
4-Captial Area	55%	42%	3%
5-West Texas	69%	29%	2%
6-Southwest Texas	55%	43%	3%
7-Corpus Christi Metropolitan	40%	55%	5%
8-East Texas	46%	54%	
9-Texas Panhandle	53%	43%	3%
10-West/Central Texas	58%	38%	4%
11-Waco Area	60%	38%	2%
Texas	**54%**	**44%**	**2%**

Table C31. What Types of Light Bulbs do you use in your Home?

Region	Incandescent	CFL	LED
1-Houston Metropolitan	9%		10%
2-Dallas/Fort-Worth Metroplex	7%	1%	11%
3-San Antonio Area	7%		6%
4-Captial Area	5%		6%
5-West Texas	1%		2%
6-Southwest Texas	2%		2%
7-Corpus Christi Metropolitan	2%		1%
8-East Texas	3%		2%
9-Texas Panhandle	4%		4%
10-West/Central Texas	4%		6%
11-Waco Area	1%		2%
Texas	**44%**	**2%**	**54%**

Table C32. How Many Days of the Week is someone at Home Between 9am and 4pm?

Region	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
1-Houston Metropolitan	2%	4%	14%	8%	6%	5%	4%	56%
2-Dallas/Fort-Worth Metroplex	2%	3%	13%	5%	4%	6%	3%	63%
3-San Antonio Area	2%	6%	16%	3%	3%	7%	2%	61%
4-Captial Area	3%	2%	18%	5%	4%	3%	7%	58%
5-West Texas	1%		16%	6%	4%	9%	4%	59%
6-Southwest Texas	1%	3%	11%	15%	4%	7%	5%	53%
7-Corpus Christi Metropolitan		4%	10%	3%	4%	4%	6%	68%
8-East Texas	2%	4%	12%	3%	1%	2%	3%	72%
9-Texas Panhandle	1%	1%	13%	6%	8%	5%	1%	64%
10-West/Central Texas	2%	3%	17%	2%	3%	5%	1%	66%
11-Waco Area	3%	3%	18%	4%	6%	7%	1%	57%
Texas	**2%**	**3%**	**15%**	**6%**	**4%**	**6%**	**3%**	**61%**

Table C33. How Many Days of the Week is someone at Home the Entire Period of 9am and 4pm?

Region	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
1-Houston Metropolitan	5%	6%	16%	9%	6%	12%	5%	41%
2-Dallas/Fort-Worth Metroplex	7%	7%	13%	7%	6%	9%	5%	46%
3-San Antonio Area	7%	7%	12%	6%	9%	13%	5%	41%
4-Captial Area	9%	7%	17%	7%	7%	8%	8%	37%
5-West Texas	4%	6%	16%	3%	7%	9%	4%	50%
6-Southwest Texas	3%	6%	20%	10%	5%	11%	7%	37%
7-Corpus Christi Metropolitan		7%	15%	10%	9%	4%	3%	51%
8-East Texas	6%	5%	10%	6%	6%	8%	6%	52%
9-Texas Panhandle	7%	5%	12%	6%	9%	8%	5%	47%
10-West/Central Texas	5%	8%	13%	7%	4%	8%	6%	49%
11-Waco Area	9%	4%	15%	9%	7%	12%	3%	41%
Texas	**6%**	**7%**	**14%**	**7%**	**7%**	**10%**	**5%**	**44%**

Table C34. Is there a Device in your Home that uses More Electricity than would Normally be used in a Home?

Region	No	Yes
1-Houston Metropolitan	88%	12%
2-Dallas/Fort-Worth Metroplex	91%	9%
3-San Antonio Area	90%	10%
4-Captial Area	93%	7%
5-West Texas	76%	24%
6-Southwest Texas	87%	12%
7-Corpus Christi Metropolitan	87%	13%
8-East Texas	81%	19%
9-Texas Panhandle	88%	12%
10-West/Central Texas	86%	14%
11-Waco Area	93%	7%
Texas	88%	11%

Table C35. What is that device?

Region	AC/Heater	Computer	CPAP/Oxygen	Phone	TV
1-Houston Metropolitan	2.9%	0.8%	1.0%	1.0%	0.5%
2-Dallas/Fort-Worth Metroplex	1.8%	0.8%	1.8%	1.0%	0.8%
3-San Antonio Area	1.8%	0.7%	1.1%	1.1%	1.1%
4-Captial Area	0.5%	0.5%	1.0%	0.5%	1.0%
5-West Texas	8.8%	1.5%	7.4%	2.9%	1.5%
6-Southwest Texas	2.1%	1.0%	2.1%	2.1%	1.0%
7-Corpus Christi Metropolitan			4.4%	1.5%	1.5%
8-East Texas	8.2%	2.1%	4.1%		1.0%
9-Texas Panhandle	3.0%	1.2%	1.8%		0.6%
10-West/Central Texas	1.4%	0.5%	3.4%	0.5%	1.4%
11-Waco Area	2.9%		1.5%		
Texas	**2.5%**	**0.8%**	**2.0%**	**0.9%**	**0.9%**

Table C36. Respondents Temperature normally set during the Summer?

Region	Cold	Comfortable	Hot	Moderately Cold	Moderately Warm
1-Houston Metropolitan	1%	51%	16%	5%	27%
2-Dallas/Fort-Worth Metroplex	1%	57%	10%	5%	27%
3-San Antonio Area	1%	54%	17%	5%	23%
4-Captial Area	1%	53%	9%	3%	33%
5-West Texas		32%	29%	4%	34%
6-Southwest Texas	3%	55%	25%	4%	13%
7-Corpus Christi Metropolitan		46%	22%	3%	29%
8-East Texas		53%	14%	2%	31%
9-Texas Panhandle	1%	60%	16%	3%	20%
10-West/Central Texas	1%	52%	14%	5%	27%
11-Waco Area	1%	47%	13%	6%	32%
Texas	**1%**	**53%**	**15%**	**4%**	**27%**

Table C37. Respondents Temperature normally set on Thermostat during the Day in the Summer

Region	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1-Houston Metropolitan	5%	2%	3%	3%	4%	15%	2%	12%	7%	6%	10%	7%	4%	9%	2%	2%
2-Dallas/Fort-Worth Metroplex	2%	1%	3%	5%	3%	14%	6%	14%	7%	4%	13%	6%	4%	5%	3%	2%
3-San Antonio Area	6%	3%	2%	4%	4%	11%	4%	12%	6%	7%	11%	7%	6%	8%	1%	3%
4-Captial Area	4%	0%	1%	4%	2%	17%	5%	11%	8%	5%	6%	10%	6%	10%	1%	3%
5-West Texas	6%	3%	3%	6%	6%	19%	6%	12%	10%	3%	4%	6%	0%	1%	0%	3%
6-Southwest Texas	6%	2%	2%	2%	2%	10%	3%	12%	5%	4%	11%	12%	0%	5%	3%	3%
7-Corpus Christi Metropolitan	4%	1%	0%	6%	3%	10%	1%	6%	4%	16%	13%	9%	7%	7%	0%	0%
8-East Texas	5%	2%	2%	7%	7%	15%	3%	21%	8%	6%	9%	2%	2%	3%	0%	1%
9-Texas Panhandle	8%	3%	2%	7%	4%	20%	5%	10%	5%	6%	10%	1%	2%	5%	1%	1%
10-West/Central Texas	7%	2%	2%	7%	5%	18%	4%	14%	7%	3%	9%	4%	4%	6%	1%	1%
11-Waco Area	6%	1%	1%	9%	6%	19%	6%	10%	3%	6%	10%	4%	1%	6%	0%	1%
Texas	**5%**	**2%**	**2%**	**5%**	**4%**	**15%**	**4%**	**12%**	**7%**	**5%**	**10%**	**6%**	**4%**	**7%**	**2%**	**2%**

Table C38. Respondents Temperature normally set on Thermostat during the Evening in the Summer

Region	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1-Houston Metropolitan	3%	2%	3%	6%	6%	19%	3%	13%	7%	3%	8%	7%	4%	4%	3%	2%
2-Dallas/Fort-Worth Metroplex	4%	1%	2%	7%	4%	14%	8%	9%	7%	5%	10%	5%	3%	7%	1%	2%
3-San Antonio Area	4%	1%	2%	5%	5%	17%	4%	13%	8%	4%	12%	5%	3%	8%	1%	3%
4-Captial Area	3%	2%	4%	4%	2%	14%	7%	13%	7%	9%	7%	4%	4%	10%	1%	3%
5-West Texas	4%	0%	9%	7%	6%	21%	7%	12%	3%	1%	10%	3%	3%	1%	0%	3%
6-Southwest Texas	2%	0%	4%	2%	3%	10%	2%	11%	8%	2%	13%	15%	3%	6%	2%	3%
7-Corpus Christi Metropolitan	1%	1%	0%	3%	1%	16%	7%	9%	9%	10%	18%	4%	6%	3%	1%	0%
8-East Texas	6%	0%	4%	14%	7%	13%	5%	22%	5%	4%	8%	2%	1%	2%	2%	0%
9-Texas Panhandle	5%	2%	2%	6%	5%	16%	6%	11%	8%	4%	9%	2%	1%	5%	1%	3%
10-West/Central Texas	7%	3%	2%	10%	3%	17%	7%	15%	5%	5%	7%	5%	3%	2%	1%	1%
11-Waco Area	7%	4%	1%	6%	6%	21%	4%	9%	7%	4%	9%	1%	3%	3%	1%	3%
Texas	**4%**	**2%**	**3%**	**6%**	**5%**	**16%**	**6%**	**12%**	**7%**	**5%**	**9%**	**5%**	**3%**	**5%**	**2%**	**2%**

Table C39. Respondents Home Temperature during the Winter

Region	Cold	Comfortable	Hot	Moderately Cold	Moderately Warm
1-Houston Metropolitan	9%	48%	2%	28%	14%
2-Dallas/Fort-Worth Metroplex	9%	51%	2%	25%	14%
3-San Antonio Area	9%	52%	1%	29%	8%
4-Captial Area	8%	43%	2%	32%	14%
5-West Texas	10%	40%		32%	18%
6-Southwest Texas	16%	46%	1%	21%	15%
7-Corpus Christi Metropolitan	10%	50%	1%	25%	13%
8-East Texas	13%	46%	1%	30%	9%
9-Texas Panhandle	13%	45%	2%	31%	9%
10-West/Central Texas	7%	55%	1%	24%	12%
11-Waco Area	6%	49%	3%	31%	12%
Texas	**10%**	**49%**	**2%**	**28%**	**12%**

Table C40. Temperature Respondents Household Normally set the Thermostat to during the Day in the Winter

Region	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1-Houston Metropolitan	5%	2%	3%	9%	5%	14%	5%	11%	7%	6%	9%	6%	2%	2%	1%	4%
2-Dallas/Fort-Worth Metroplex	6%	1%	4%	10%	5%	15%	5%	12%	7%	5%	8%	4%	2%	2%	1%	2%
3-San Antonio Area	4%	1%	3%	9%	3%	14%	5%	11%	7%	6%	11%	4%	4%	4%	1%	4%
4-Captial Area	7%	3%	2%	9%	7%	14%	3%	11%	8%	5%	8%	3%	2%	3%	2%	2%
5-West Texas	3%	3%	4%	6%	7%	16%	7%	9%	1%	7%	12%	6%		3%	3%	1%
6-Southwest Texas	1%	2%	3%	3%	1%	11%	3%	7%	3%	5%	10%	7%	4%	5%		9%
7-Corpus Christi Metropolitan	1%			3%	4%	12%	7%	16%	3%	7%	18%	7%	4%	4%	1%	
8-East Texas	5%	1%	2%	6%	3%	20%	5%	13%	10%	5%	9%	2%	1%	3%	3%	
9-Texas Panhandle	2%	3%	1%	11%	7%	20%	4%	12%	7%	3%	11%	2%	3%	1%		2%
10-West/Central Texas	2%	1%	1%	12%	6%	17%	8%	13%	5%	4%	10%	4%		2%	1%	3%
11-Waco Area	4%		3%	6%	3%	24%	4%	12%	3%	6%	10%	6%	3%	1%		4%
Texas	**4%**	**2%**	**3%**	**9%**	**5%**	**15%**	**5%**	**11%**	**6%**	**5%**	**10%**	**5%**	**2%**	**3%**	**1%**	**3%**

Table C41. Temperature Respondents Household Normally set the Thermostat to during the Evening in the Winter

Region	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1-Houston Metropolitan	4%	2%	3%	10%	6%	12%	5%	8%	6%	6%	10%	4%	4%	3%	1%	4%
2-Dallas/Fort-Worth Metroplex	5%	3%	4%	9%	6%	11%	6%	14%	7%	5%	6%	3%	3%	2%	1%	2%
3-San Antonio Area	3%	3%	3%	9%	3%	15%	5%	11%	4%	6%	11%	4%	3%	4%	1%	7%
4-Captial Area	7%	1%	3%	12%	6%	9%	6%	12%	6%	5%	9%	4%	3%	2%	2%	1%
5-West Texas	10%		3%	6%	3%	16%	4%	7%	6%	7%	7%	6%	4%	1%	1%	6%
6-Southwest Texas	1%	1%	2%	1%		14%	3%	8%	3%		7%	8%	7%	8%	2%	8%
7-Corpus Christi Metropolitan	3%		1%	4%	3%	13%	1%	10%	10%	6%	16%	13%			6%	1%
8-East Texas	6%	2%	2%	10%	4%	13%	7%	10%	11%	4%	7%	3%	1%	1%	4%	1%
9-Texas Panhandle	5%	2%	3%	10%	7%	18%	5%	8%	7%	5%	9%	1%	3%	4%	2%	1%
10-West/Central Texas	3%	3%	3%	5%	8%	16%	4%	10%	6%	6%	9%	4%		3%	1%	2%
11-Waco Area	1%	1%	4%	3%	9%	16%	4%	10%	6%	4%	9%	1%	3%	6%	1%	3%
Texas	**5%**	**2%**	**3%**	**8%**	**5%**	**13%**	**5%**	**10%**	**6%**	**5%**	**9%**	**4%**	**3%**	**3%**	**2%**	**3%**

Table C42. Average Monthly Rent, Mortgage or Loan Payment of Respondents

Region	Monthly Rent	Sample Size	Mortgage Payment	Sample Size	Loan Payment	Sample Size
1-Houston Metropolitan	$902	13%	$1,841	13%	$1,758	13%
2-Dallas/Fort-Worth Metroplex	$858	12%	$1,045	6%	$3,964	0.5%
3-San Antonio Area	$863	9%	$885	4%	$544	0.4%
4-Captial Area	$980	8%	$1,207	4%	$15,000	0.1%
5-West Texas	$728	2%	$713	1%	$2,731	0.3%
6-Southwest Texas	$687	3%	$1,847	1%	$377	0.1%
7-Corpus Christi Metropolitan	$755	2%	$850	1%	$189	0.1%
8-East Texas	$609	3%	$725	1%	$50	0.1%
9-Texas Panhandle	$626	5%	$774	3%		0.0%
10-West/Central Texas	$698	5%	$4,682	3%	$458	0.3%
11-Waco Area	$625	2%	$807	1%	$1,412	0.1%
Texas	**$817**	**64%**	**$1,547**	**33%**	**$2,053**	**3%**

Table C43. My Households Reviews the Electricity bill each Month

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	14%	29%	5%	46%	5%
2-Dallas/Fort-Worth Metroplex	20%	21%	5%	47%	7%
3-San Antonio Area	15%	32%	8%	37%	8%
4-Captial Area	14%	31%	9%	39%	7%
5-West Texas	15%	26%	12%	37%	10%
6-Southwest Texas	21%	28%	6%	38%	7%
7-Corpus Christi Metropolitan	15%	28%	4%	50%	3%
8-East Texas	9%	38%	7%	38%	7%
9-Texas Panhandle	16%	27%	10%	41%	5%
10-West/Central Texas	17%	27%	5%	40%	11%
11-Waco Area	21%	31%	6%	40%	3%
Texas	**16%**	**28%**	**7%**	**42%**	**7%**

Table C44. When my Electricity Bill is High my Household is able to Reduce our Usage for the Next Month

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	24%	38%	9%	23%	6%
2-Dallas/Fort-Worth Metroplex	26%	36%	11%	20%	7%
3-San Antonio Area	24%	34%	16%	19%	7%
4-Captial Area	24%	38%	11%	19%	9%
5-West Texas	37%	35%	9%	13%	6%
6-Southwest Texas	29%	31%	14%	19%	7%
7-Corpus Christi Metropolitan	22%	40%	9%	25%	4%
8-East Texas	24%	44%	13%	11%	7%
9-Texas Panhandle	29%	35%	11%	15%	11%
10-West/Central Texas	24%	36%	12%	19%	9%
11-Waco Area	29%	43%	10%	15%	3%
Texas	**26%**	**37%**	**11%**	**19%**	**7%**

Table C45. My Household has a Good Understanding about which Appliances Increase the Electricity Bill the Most

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	23%	39%	8%	27%	4%
2-Dallas/Fort-Worth Metroplex	23%	35%	7%	28%	6%
3-San Antonio Area	18%	35%	9%	28%	10%
4-Captial Area	22%	36%	10%	25%	7%
5-West Texas	29%	32%	15%	21%	3%
6-Southwest Texas	16%	35%	7%	32%	9%
7-Corpus Christi Metropolitan	16%	41%	7%	31%	4%
8-East Texas	20%	45%	11%	18%	6%
9-Texas Panhandle	16%	39%	10%	21%	13%
10-West/Central Texas	21%	30%	10%	30%	8%
11-Waco Area	22%	31%	12%	34%	1%
Texas	**21%**	**36%**	**9%**	**27%**	**7%**

Table C46. Household has a Good Understanding about which Activities Increase the Electricity Bill the Most

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	17%	41%	6%	32%	4%
2-Dallas/Fort-Worth Metroplex	19%	40%	6%	29%	6%
3-San Antonio Area	15%	45%	8%	26%	6%
4-Captial Area	19%	43%	9%	23%	6%
5-West Texas	22%	44%	7%	24%	3%
6-Southwest Texas	15%	39%	7%	33%	6%
7-Corpus Christi Metropolitan	16%	31%	10%	40%	3%
8-East Texas	18%	47%	11%	19%	5%
9-Texas Panhandle	17%	40%	10%	25%	8%
10-West/Central Texas	20%	30%	10%	33%	7%
11-Waco Area	15%	35%	12%	35%	3%
Texas	**18%**	**40%**	**8%**	**29%**	**6%**

Table C47. Household Understands How to Program the Thermostat

Region	Neither agree nor disagree	Somewhat agree	Somewhat disagree	Strongly agree	Strongly disagree
1-Houston Metropolitan	16%	32%	3%	45%	3%
2-Dallas/Fort-Worth Metroplex	17%	30%	4%	44%	4%
3-San Antonio Area	15%	28%	8%	44%	5%
4-Captial Area	19%	25%	8%	44%	4%
5-West Texas	24%	32%	4%	37%	3%
6-Southwest Texas	26%	27%	9%	36%	3%
7-Corpus Christi Metropolitan	25%	32%	1%	40%	1%
8-East Texas	18%	29%	3%	41%	9%
9-Texas Panhandle	22%	27%	4%	43%	4%
10-West/Central Texas	17%	27%	5%	45%	6%
11-Waco Area	21%	26%	1%	47%	4%
Texas	**18%**	**29%**	**5%**	**43%**	**4%**

Table C48. Respondents who Programmed Thermostat

Region	Yes	No	My thermostat is not programmable
1-Houston Metropolitan	50%	18%	31%
2-Dallas/Fort-Worth Metroplex	48%	20%	32%
3-San Antonio Area	48%	20%	33%
4-Captial Area	48%	22%	30%
5-West Texas	41%	22%	37%
6-Southwest Texas	37%	21%	41%
7-Corpus Christi Metropolitan	50%	19%	31%
8-East Texas	36%	14%	49%
9-Texas Panhandle	47%	14%	39%
10-West/Central Texas	44%	16%	40%
11-Waco Area	43%	19%	38%
Texas	**46%**	**19%**	**35%**

Table C49. Average Monthly Electricity Bill for each Season

Region	Winter	Spring	Summer	Fall
1-Houston Metropolitan	$135	$120	$168	$124
2-Dallas/Fort-Worth Metroplex	$151	$116	$164	$121
3-San Antonio Area	$143	$128	$179	$128
4-Captial Area	$134	$116	$162	$118
5-West Texas	$109	$98	$129	$97
6-Southwest Texas	$163	$151	$191	$149
7-Corpus Christi Metropolitan	$161	$150	$195	$150
8-East Texas	$164	$131	$187	$139
9-Texas Panhandle	$156	$127	$170	$124
10-West/Central Texas	$156	$125	$167	$126
11-Waco Area	$154	$117	$162	$118
Texas	**$146**	**$123**	**$170**	**$125**

Table C50. Since June 2017, Respondents or other members of household who Experienced the Following:

Region	Lost a job or become unemployed	Had work hours or pay reduced	Received foreclosure or eviction notice	Divorced or separated from spouse/domestic partner	Had a death of a household member	Had a baby	Cared for elderly or disabled household member	Became disabled or seriously ill	Experienced a natural disaster
1-Houston Metropolitan	23%	17%	2%	2%	3%	7%	7%	7%	45%
2-Dallas/Fort-Worth Metroplex	18%	13%	2%	6%	4%	3%	5%	8%	1%
3-San Antonio Area	23%	18%	3%	4%	3%	7%	6%	8%	2%
4-Captial Area	17%	15%		2%	3%	5%	6%	5%	3%
5-West Texas	19%	16%	1%	3%	10%	4%	6%	6%	
6-Southwest Texas	20%	18%	2%	3%	7%	6%	7%	2%	2%
7-Corpus Christi Metropolitan	19%	25%		3%	6%	1%	10%	6%	50%
8-East Texas	21%	15%	4%	6%	4%	2%	10%	5%	19%
9-Texas Panhandle	23%	16%	2%	4%	8%	8%	7%	5%	1%
10-West/Central Texas	29%	14%	2%	6%	7%	10%	7%	9%	3%
11-Waco Area	21%	10%		4%	3%	9%	7%	12%	3%
Texas	**21%**	**16%**	**2%**	**4%**	**5%**	**6%**	**7%**	**7%**	**13%**

Table C51. Since June 2017, Respondents who had Difficulty Paying each type of Bill

Region	Electricity bill Yes	Other basic needs such as food, housing, medicine, etc. Yes
1-Houston Metropolitan	33%	42%
2-Dallas/Fort-Worth Metroplex	29%	34%
3-San Antonio Area	36%	41%
4-Captial Area	29%	38%
5-West Texas	38%	38%
6-Southwest Texas	32%	40%
7-Corpus Christi Metropolitan	40%	47%
8-East Texas	51%	58%
9-Texas Panhandle	40%	41%
10-West/Central Texas	36%	43%
11-Waco Area	32%	37%
Texas	**34%**	**40%**

Table C52. Since June 2017, what Financial Options Respondents used to pay Electricity Bills or meet Household's Basic Needs

Region	Use your household's current income	Use your household's savings or other investments	Cut back on non-essential spending for things your household wants	Reduce your household's energy usage	Borrow money from family, friends or peers	Borrow money using a short-term loan	Use a credit card	Leave rent/mortgage unpaid	Leave some household bills unpaid past the due date	Received emergency assistance from my electricity provider	Received emergency assistance from other city or regional programs	None of the above
1-Houston Metropolitan	71%	16%	34%	25%	18%	6%	26%	5%	19%	4%	7%	6%
2-Dallas/Fort-Worth Metroplex	68%	13%	31%	24%	16%	8%	28%	4%	19%	4%	5%	10%
3-San Antonio Area	72%	19%	37%	31%	23%	12%	19%	5%	24%	3%	3%	8%
4-Captial Area	73%	15%	35%	26%	17%	6%	27%	7%	16%	4%	4%	7%
5-West Texas	62%	18%	29%	28%	19%	12%	25%	4%	15%	3%	6%	7%
6-Southwest Texas	59%	8%	28%	26%	15%	19%	31%	1%	19%	3%	5%	5%
7-Corpus Christi Metropolitan	62%	13%	43%	25%	22%	16%	25%	6%	18%	4%	6%	9%
8-East Texas	76%	15%	54%	38%	27%	10%	28%	5%	27%	4%	7%	5%
9-Texas Panhandle	78%	17%	41%	25%	24%	11%	18%	7%	24%	2%	2%	7%
10-West/Central Texas	68%	15%	40%	29%	18%	12%	22%	6%	20%	3%	7%	9%
11-Waco Area	72%	12%	31%	29%	15%	12%	24%	4%	16%	3%	6%	10%
Texas	**70%**	**15%**	**36%**	**27%**	**19%**	**10%**	**25%**	**5%**	**20%**	**4%**	**5%**	**8%**

Table C53. Since June 2017, how many times Respondents Utilized Emergency Assistance from Electricity Provider

Region	0	1	2	3	4	5	6
1-Houston Metropolitan		44%	31%	6%	13%		
2-Dallas/Fort-Worth Metroplex	13%	33%	13%	7%		13%	7%
3-San Antonio Area		38%	38%	25%			
4-Captial Area		22%	11%	44%			
5-West Texas		50%					
6-Southwest Texas						50%	
7-Corpus Christi Metropolitan		67%		33%			
8-East Texas		25%	25%			25%	
9-Texas Panhandle			33%				33%
10-West/Central Texas	17%	67%		17%			
11-Waco Area		50%		50%			
Texas	**4%**	**37%**	**19%**	**16%**	**3%**	**6%**	**3%**

Table C54. Since June 2017, how many times Respondents Utilized Emergency Assistance from Other City or Regional Programs

Region	0	1	2	3	4	5	6
1-Houston Metropolitan	11%	57%	18%	4%			
2-Dallas/Fort-Worth Metroplex	16%	42%	11%	5%		11%	
3-San Antonio Area	13%	25%	38%	25%			
4-Captial Area	13%	38%	13%		25%		
5-West Texas	25%	50%		25%			
6-Southwest Texas	20%	40%	40%				
7-Corpus Christi Metropolitan		100%					
8-East Texas	14%	57%	14%			14%	
9-Texas Panhandle		25%	25%	25%			
10-West/Central Texas	14%	7%	29%	21%		7%	21%
11-Waco Area	25%		50%	25%			
Texas	13%	40%	20%	10%	2%	4%	3%

Table C55. Since June 2017, how often Respondents turned off Air Conditioning or Heating to Reduce Household's Electricity Usage

Region	Never	Sometimes	About half the time	Most of the time	Always
1-Houston Metropolitan	20%	7%	12%	21%	40%
2-Dallas/Fort-Worth Metroplex	16%	7%	12%	25%	39%
3-San Antonio Area	27%	7%	12%	18%	36%
4-Captial Area	23%	3%	9%	22%	44%
5-West Texas	19%	7%	18%	12%	44%
6-Southwest Texas	15%	7%	16%	20%	41%
7-Corpus Christi Metropolitan	22%	4%	15%	18%	41%
8-East Texas	10%	2%	11%	22%	55%
9-Texas Panhandle	16%	6%	11%	21%	46%
10-West/Central Texas	21%	8%	12%	21%	39%
11-Waco Area	25%	6%	6%	16%	47%
Texas	**20%**	**6%**	**12%**	**21%**	**41%**

Table C56. Since June 2017, how often Respondents Avoided doing Laundry to Reduce Household's Electricity Usage

Region	Never	Sometimes	About half the time	Most of the time	Always
1-Houston Metropolitan	12%	5%	7%	48%	28%
2-Dallas/Fort-Worth Metroplex	12%	5%	6%	51%	26%
3-San Antonio Area	16%	2%	7%	50%	25%
4-Captial Area	10%	4%	5%	52%	29%
5-West Texas	12%	9%	6%	46%	28%
6-Southwest Texas	13%	4%	5%	55%	23%
7-Corpus Christi Metropolitan	9%	1%	4%	54%	31%
8-East Texas	13%	1%	7%	56%	23%
9-Texas Panhandle	14%	3%	4%	55%	24%
10-West/Central Texas	13%	3%	8%	50%	26%
11-Waco Area	12%	3%	6%	53%	26%
Texas	**13%**	**4%**	**6%**	**51%**	**26%**

Table C57. Since June 2017, how often Respondents Avoided Running the Dishwasher to Reduce Household's Electricity Usage

Region	Never	Sometimes	About half the time	Most of the time	Always
1-Houston Metropolitan	11%	24%	10%	35%	20%
2-Dallas/Fort-Worth Metroplex	6%	23%	10%	41%	20%
3-San Antonio Area	12%	31%	11%	35%	12%
4-Captial Area	16%	23%	7%	39%	16%
5-West Texas	12%	33%	9%	28%	18%
6-Southwest Texas	9%	25%	13%	43%	9%
7-Corpus Christi Metropolitan	13%	25%	7%	32%	22%
8-East Texas	6%	21%	6%	53%	14%
9-Texas Panhandle	10%	21%	12%	44%	14%
10-West/Central Texas	6%	36%	3%	42%	13%
11-Waco Area	9%	24%	6%	47%	15%
Texas	**10%**	**26%**	**9%**	**39%**	**16%**

Table C58. Since June 2017, how often Respondents Avoided Cooking to Reduce Household's Electricity Usage

Region	Never	Sometimes	About half the time	Most of the time	Always
1-Houston Metropolitan	12%	1%	4%	59%	23%
2-Dallas/Fort-Worth Metroplex	10%	4%	4%	54%	27%
3-San Antonio Area	14%	2%	4%	59%	21%
4-Captial Area	8%	2%	6%	59%	25%
5-West Texas	9%	6%	4%	66%	15%
6-Southwest Texas	11%	1%	8%	59%	21%
7-Corpus Christi Metropolitan	13%		4%	63%	19%
8-East Texas	9%	3%	5%	58%	25%
9-Texas Panhandle	15%	3%	2%	61%	19%
10-West/Central Texas	9%	3%	2%	58%	28%
11-Waco Area	7%	3%	4%	60%	25%
Texas	**11%**	**3%**	**4%**	**59%**	**24%**

Table C59. Since June 2017, how often Respondents turned off Lights Not In Use to Reduce Household's Electricity Usage

Region	Never	Sometimes	About half the time	Most of the time	Always
1-Houston Metropolitan	11%	53%	23%	7%	6%
2-Dallas/Fort-Worth Metroplex	7%	54%	22%	8%	9%
3-San Antonio Area	7%	59%	23%	4%	7%
4-Captial Area	10%	49%	30%	2%	9%
5-West Texas	9%	49%	34%	3%	4%
6-Southwest Texas	13%	43%	28%	5%	10%
7-Corpus Christi Metropolitan	19%	50%	10%	6%	15%
8-East Texas	8%	52%	30%	4%	6%
9-Texas Panhandle	8%	54%	22%	6%	10%
10-West/Central Texas	9%	59%	18%	6%	7%
11-Waco Area	10%	46%	28%	3%	13%
Texas	**9%**	**53%**	**24%**	**6%**	**8%**

Table C60. Since June 2017, how often Respondents turned off Office Equipment (computer, printer, etc.) to Reduce Household's Electricity Usage

Region	Never	Sometimes	About half the time	Most of the time	Always
1-Houston Metropolitan	15%	33%	20%	17%	16%
2-Dallas/Fort-Worth Metroplex	16%	34%	15%	18%	17%
3-San Antonio Area	14%	37%	21%	15%	13%
4-Captial Area	16%	27%	20%	17%	20%
5-West Texas	12%	40%	19%	7%	21%
6-Southwest Texas	15%	35%	21%	16%	12%
7-Corpus Christi Metropolitan	12%	34%	15%	18%	22%
8-East Texas	10%	31%	22%	17%	20%
9-Texas Panhandle	14%	30%	17%	22%	18%
10-West/Central Texas	12%	39%	18%	15%	16%
11-Waco Area	12%	37%	7%	15%	29%
Texas	**14%**	**34%**	**18%**	**17%**	**17%**

Table C61. Since June 2017, how often Respondents turned off Entertainment System (TV, Nintendo, etc.) to Reduce Household's Electricity Usage

Region	Never	Sometimes	About half the time	Most of the time	Always

1-Houston Metropolitan	16%	36%	18%	12%	18%
2-Dallas/Fort-Worth Metroplex	13%	34%	18%	17%	17%
3-San Antonio Area	19%	37%	21%	11%	12%
4-Captial Area	20%	27%	19%	15%	19%
5-West Texas	15%	34%	30%	7%	13%
6-Southwest Texas	15%	27%	24%	15%	19%
7-Corpus Christi Metropolitan	18%	32%	10%	13%	26%
8-East Texas	20%	21%	23%	19%	19%
9-Texas Panhandle	19%	30%	19%	16%	16%
10-West/Central Texas	14%	40%	15%	16%	14%
11-Waco Area	13%	35%	10%	13%	28%
Texas	**16%**	**33%**	**19%**	**14%**	**17%**

Table C62. Respondents Utility Bills caused Delay or Skipped Payments in the Following Categories

Region	Food	Medicine	Transportation	Housing	Childcare	Education	Clothing	Technology	Other
1-Houston Metropolitan	30%	14%	19%	14%	4%	7%	45%	23%	26%
2-Dallas/Fort-Worth Metroplex	33%	17%	22%	9%	3%	7%	39%	23%	27%
3-San Antonio Area	35%	16%	21%	13%	6%	7%	46%	26%	23%
4-Captial Area	31%	16%	17%	6%	4%	5%	38%	23%	25%
5-West Texas	43%	19%	26%	6%	4%	3%	56%	28%	18%
6-Southwest Texas	39%	12%	15%	11%	4%	8%	46%	22%	19%
7-Corpus Christi Metropolitan	41%	22%	24%	10%	3%	9%	44%	21%	25%
8-East Texas	46%	26%	23%	9%	1%	4%	54%	22%	26%
9-Texas Panhandle	41%	21%	26%	13%	3%	7%	50%	28%	24%
10-West/Central Texas	37%	20%	20%	10%	5%	7%	47%	24%	28%
11-Waco Area	31%	16%	15%	10%		6%	54%	37%	24%
Texas	**35%**	**17%**	**21%**	**11%**	**4%**	**7%**	**45%**	**24%**	**25%**

Table C63. Respondents with Knowledge of Energy Efficiency or Assistance Programs

Region	Energy efficiency rebate program	Energy bill assistance program	Energy bill payment plan	Weatherization program
1-Houston Metropolitan	14%	22%	20%	6%
2-Dallas/Fort-Worth Metroplex	15%	21%	17%	11%
3-San Antonio Area	20%	26%	30%	17%
4-Captial Area	17%	20%	19%	18%
5-West Texas	16%	26%	28%	12%
6-Southwest Texas	5%	26%	13%	8%
7-Corpus Christi Metropolitan	9%	13%	10%	9%
8-East Texas	5%	24%	13%	10%
9-Texas Panhandle	11%	12%	18%	8%
10-West/Central Texas	15%	23%	14%	13%
11-Waco Area	21%	26%	26%	19%
Texas	**14%**	**22%**	**19%**	**11%**

Table C64. Respondents who Participated In or Received Benefits from Programs

Region	Yes	No	I don't know
1-Houston Metropolitan	6%	15%	79%
2-Dallas/Fort-Worth Metroplex	4%	16%	81%
3-San Antonio Area	4%	21%	76%
4-Captial Area	5%	15%	80%
5-West Texas	13%	13%	74%
6-Southwest Texas	9%	15%	75%
7-Corpus Christi Metropolitan	4%	9%	87%
8-East Texas	8%	12%	79%
9-Texas Panhandle	1%	11%	88%
10-West/Central Texas	8%	14%	78%
11-Waco Area	4%	22%	74%
Texas	**5%**	**15%**	**79%**

Table C65. Program Respondents Participated In or Received Assistance From

Region	Energy efficiency rebate program	Energy bill assistance program	Energy bill payment plan	Weatherization program
1-Houston Metropolitan	3%	6%	6%	1%
2-Dallas/Fort-Worth Metroplex	5%	4%	5%	2%
3-San Antonio Area	2%	4%	7%	3%
4-Captial Area	4%	5%	2%	2%
5-West Texas		13%	7%	
6-Southwest Texas		9%	5%	2%
7-Corpus Christi Metropolitan	4%	4%	1%	1%
8-East Texas	2%	8%	3%	2%
9-Texas Panhandle	3%	1%	5%	1%
10-West/Central Texas	3%	8%	3%	1%
11-Waco Area	7%	4%	6%	1%
Texas	**3%**	**5%**	**5%**	**2%**

Table C66. Division of Respondents Enrolled with Electricity Provider or Public Agency

Region	Electricity Provider	Public Agency	Other
1-Houston Metropolitan	58%	29%	13%
2-Dallas/Fort-Worth Metroplex	36%	50%	14%
3-San Antonio Area	80%	20%	0%
4-Captial Area	50%	50%	0%
5-West Texas	44%	33%	22%
6-Southwest Texas	67%	33%	0%
7-Corpus Christi Metropolitan	33%	33%	33%
8-East Texas	25%	63%	13%
9-Texas Panhandle	100%		0%
10-West/Central Texas	41%	41%	18%
11-Waco Area	33%	67%	0%
Texas	**50%**	**39%**	**11%**

Table C67. Since June 2017, Average Number of Times Respondents Received Benefits

Region	1	2	3	4	5	6	7
1-Houston Metropolitan	41%	18%	9%	18%	5%	9%	0%
2-Dallas/Fort-Worth Metroplex	23%	38%	15%		8%	15%	0%
3-San Antonio Area	29%	29%			14%		29%
4-Captial Area	43%		29%			14%	14%
5-West Texas	67%		22%	11%			
6-Southwest Texas	86%					14%	
7-Corpus Christi Metropolitan	100%						
8-East Texas	71%			14%	14%	0%	0%
9-Texas Panhandle		100%					
10-West/Central Texas	31%	25%	19%		6%	19%	0%
11-Waco Area	67%		33%				
Texas	**45%**	**18%**	**13%**	**6%**	**5%**	**9%**	**3%**

Table C68. Respondents Type of Health Care Coverage

Region	Employer	Medicaid	Medicare	None	Other	Private
1-Houston Metropolitan	31%	12%	19%	19%	4%	13%
2-Dallas/Fort-Worth Metroplex	34%	8%	23%	20%	4%	10%
3-San Antonio Area	32%	14%	18%	20%	5%	11%
4-Captial Area	36%	9%	17%	19%	8%	11%
5-West Texas	28%	15%	13%	21%	7%	16%
6-Southwest Texas	14%	28%	11%	26%	7%	13%
7-Corpus Christi Metropolitan	28%	16%	13%	24%	3%	16%
8-East Texas	19%	11%	25%	25%	5%	15%
9-Texas Panhandle	30%	13%	13%	21%	7%	15%
10-West/Central Texas	29%	16%	17%	23%	3%	12%
11-Waco Area	37%	12%	15%	19%	3%	15%
Texas	**31%**	**13%**	**18%**	**21%**	**5%**	**13%**

Table C69. Respondents Annual Health Care Deductible per Person

Region	None	Less than $100	$100-$999	$1000-$1999	$2000-$2999	$3000-$4999	$5000 or more
1-Houston Metropolitan	28%	11%	26%	16%	11%	4%	4%
2-Dallas/Fort-Worth Metroplex	29%	10%	29%	14%	7%	6%	5%
3-San Antonio Area	37%	14%	20%	12%	7%	6%	4%
4-Captial Area	27%	13%	31%	13%	7%	1%	7%
5-West Texas	40%	11%	22%	16%	5%	4%	2%
6-Southwest Texas	33%	23%	23%	11%	4%	5%	1%
7-Corpus Christi Metropolitan	31%	12%	29%	4%	14%	8%	2%
8-East Texas	43%	9%	18%	19%	4%	4%	3%
9-Texas Panhandle	32%	8%	27%	11%	7%	5%	10%
10-West/Central Texas	35%	12%	25%	9%	7%	3%	8%
11-Waco Area	39%	12%	25%	7%	7%	4%	7%
Texas	**32%**	**12%**	**26%**	**13%**	**8%**	**5%**	**5%**

Table C70. Respondents with Occupants with Disabilities or Special Needs in Household

Region	No	Yes
1-Houston Metropolitan	78%	22%
2-Dallas/Fort-Worth Metroplex	78%	22%
3-San Antonio Area	73%	27%
4-Captial Area	79%	21%
5-West Texas	74%	26%
6-Southwest Texas	76%	24%
7-Corpus Christi Metropolitan	69%	31%
8-East Texas	59%	41%
9-Texas Panhandle	71%	29%
10-West/Central Texas	69%	31%
11-Waco Area	72%	28%
Texas	**74%**	**26%**

Table C71. Respondents/Other Household Members with the Following

Region	Serious Disability	Serious Respiratory Condition
1-Houston Metropolitan	17%	11%
2-Dallas/Fort-Worth Metroplex	16%	12%
3-San Antonio Area	19%	8%
4-Captial Area	14%	6%
5-West Texas	21%	9%
6-Southwest Texas	16%	7%
7-Corpus Christi Metropolitan	24%	7%
8-East Texas	19%	21%
9-Texas Panhandle	21%	12%
10-West/Central Texas	14%	10%
11-Waco Area	21%	10%
Texas	**17%**	**10%**

Table C72. Temperature in Home has made Respondent/Household Member Feel Sick or Unhealthy

Region	No	Yes
1-Houston Metropolitan	79%	21%
2-Dallas/Fort-Worth Metroplex	82%	18%
3-San Antonio Area	81%	19%
4-Captial Area	85%	15%
5-West Texas	78%	22%
6-Southwest Texas	73%	27%
7-Corpus Christi Metropolitan	74%	26%
8-East Texas	71%	29%
9-Texas Panhandle	76%	24%
10-West/Central Texas	82%	18%
11-Waco Area	85%	15%
Texas	**80%**	**20%**

Table C73. Season Respondent/Household Member Felt Ill Due to Temperature

Region	Summer	Fall	Winter	Spring
1-Houston Metropolitan	47%	10%	37%	6%
2-Dallas/Fort-Worth Metroplex	31%	13%	50%	6%
3-San Antonio Area	40%	6%	46%	8%
4-Captial Area	56%	7%	30%	7%
5-West Texas	50%	11%	33%	6%
6-Southwest Texas	39%	11%	44%	6%
7-Corpus Christi Metropolitan	38%	21%	28%	14%
8-East Texas	40%	8%	50%	3%
9-Texas Panhandle	33%	9%	55%	4%
10-West/Central Texas	40%	12%	42%	6%
11-Waco Area	47%	7%	47%	0%
Texas	**41%**	**10%**	**43%**	**6%**

Table C74. Duration Respondent/Household Member Felt Ill Due to Temperature

Region	1 week	2 weeks	3 weeks	4 weeks	5 weeks or longer
1-Houston Metropolitan	34%	30%	11%	9%	15%
2-Dallas/Fort-Worth Metroplex	35%	21%	18%	8%	17%
3-San Antonio Area	30%	30%	12%	2%	26%
4-Captial Area	39%	19%	13%	3%	26%
5-West Texas	53%	20%	7%	7%	13%
6-Southwest Texas	42%	19%	15%	12%	12%
7-Corpus Christi Metropolitan	44%	17%	17%	17%	6%
8-East Texas	21%	36%	18%	4%	21%
9-Texas Panhandle	31%	33%	10%	8%	18%
10-West/Central Texas	30%	16%	19%	14%	22%
11-Waco Area	50%	20%	10%	0%	20%
Texas	**35%**	**25%**	**14%**	**8%**	**18%**

Table C75. Temperature in Home has made Respondent/Household Member Feel Stress or Mental Discomfort

Region	No	Yes
1-Houston Metropolitan	73%	27%
2-Dallas/Fort-Worth Metroplex	78%	22%
3-San Antonio Area	75%	25%
4-Captial Area	76%	24%
5-West Texas	76%	24%
6-Southwest Texas	79%	21%
7-Corpus Christi Metropolitan	60%	40%
8-East Texas	68%	32%
9-Texas Panhandle	76%	24%
10-West/Central Texas	78%	22%
11-Waco Area	68%	32%
Texas	**75%**	**25%**

Table C76. Season Respondent/Household Member Felt Stress or Mental Discomfort

Region	Summer	Fall	Winter	Spring
1-Houston Metropolitan	52%	10%	29%	10%
2-Dallas/Fort-Worth Metroplex	47%	9%	37%	7%
3-San Antonio Area	62%	4%	25%	9%
4-Captial Area	52%	5%	40%	3%
5-West Texas	56%	8%	28%	8%
6-Southwest Texas	43%	18%	29%	11%
7-Corpus Christi Metropolitan	59%	8%	26%	8%
8-East Texas	47%	9%	37%	7%
9-Texas Panhandle	45%	6%	40%	8%
10-West/Central Texas	53%	8%	33%	5%
11-Waco Area	54%	4%	43%	
Texas	**52%**	**8%**	**33%**	**7%**

Table C77. Duration Respondent/Household Member Felt Stress or Mental Discomfort

Region	1 week	2 weeks	3 weeks	4 weeks	5 weeks or longer
1-Houston Metropolitan	26%	23%	16%	7%	28%
2-Dallas/Fort-Worth Metroplex	29%	20%	21%	5%	26%
3-San Antonio Area	27%	16%	13%	7%	36%
4-Captial Area	31%	27%	8%	4%	31%
5-West Texas	50%	13%	6%	0%	31%
6-Southwest Texas	30%	25%	5%	5%	35%
7-Corpus Christi Metropolitan	19%	22%	11%	11%	37%
8-East Texas	32%	13%	19%	10%	26%
9-Texas Panhandle	20%	20%	23%	10%	28%
10-West/Central Texas	26%	24%	13%	13%	24%
11-Waco Area	23%	45%	5%	5%	23%
Texas	**27%**	**22%**	**15%**	**7%**	**29%**

Table C78. Respondents Electricity Bills Cause Stress or Mental Discomfort

Region	No	Yes
1-Houston Metropolitan	62%	38%
2-Dallas/Fort-Worth Metroplex	67%	33%
3-San Antonio Area	55%	45%
4-Captial Area	59%	41%
5-West Texas	59%	41%
6-Southwest Texas	59%	41%
7-Corpus Christi Metropolitan	54%	46%
8-East Texas	46%	54%
9-Texas Panhandle	54%	46%
10-West/Central Texas	53%	47%
11-Waco Area	59%	41%
Texas	**59%**	**41%**

Table C79. Respondent is of Hispanic, Latino, or of Spanish Origin

Region	No	Yes
1-Houston Metropolitan	81%	19%
2-Dallas/Fort-Worth Metroplex	87%	13%
3-San Antonio Area	62%	38%
4-Captial Area	80%	20%
5-West Texas	43%	57%
6-Southwest Texas	23%	77%
7-Corpus Christi Metropolitan	51%	49%
8-East Texas	96%	4%
9-Texas Panhandle	83%	17%
10-West/Central Texas	68%	32%
11-Waco Area	88%	12%
Texas	**74%**	**26%**

Table C80. Respondents Ethnic Categorization

Region	White	Hispanic	Black or African American	Asian	American Indian or Alaska Native	Other
1-Houston Metropolitan	52%	19%	20%	6%	1%	1%
2-Dallas/Fort-Worth Metroplex	66%	13%	15%	4%	2%	2%
3-San Antonio Area	49%	38%	9%	3%	1%	1%
4-Captial Area	63%	19%	10%	6%	1%	1%
5-West Texas	35%	57%	4%	1%	0%	0%
6-Southwest Texas	19%	77%	1%	2%	0%	0%
7-Corpus Christi Metropolitan	44%	49%	6%	1%	0%	0%
8-East Texas	83%	4%	10%	1%	0%	0%
9-Texas Panhandle	72%	17%	5%	2%	2%	2%
10-West/Central Texas	61%	31%	4%	0%	1%	1%
11-Waco Area	69%	12%	15%	1%	1%	1%
Texas	**58%**	**26%**	**11%**	**3%**	**1%**	**1%**

Table C81. Respondents Marital Status

Region	Married	Single (never married)	Divorced	Widowed	Separated	Other
1-Houston Metropolitan	40%	38%	12%	5%	2%	2%
2-Dallas/Fort-Worth Metroplex	40%	33%	18%	4%	3%	2%
3-San Antonio Area	32%	40%	14%	5%	4%	4%
4-Captial Area	37%	41%	13%	4%	2%	2%
5-West Texas	44%	32%	13%	4%	3%	3%
6-Southwest Texas	42%	41%	6%	4%	1%	5%
7-Corpus Christi Metropolitan	46%	35%	9%	4%	4%	1%
8-East Texas	41%	22%	21%	5%	6%	5%
9-Texas Panhandle	47%	28%	13%	5%	4%	2%
10-West/Central Texas	45%	30%	12%	6%	5%	2%
11-Waco Area	47%	34%	13%	3%	3%	0%
Texas	**40%**	**35%**	**14%**	**5%**	**3%**	**3%**

Table C82. Respondents Highest Degree or Level of School Completed

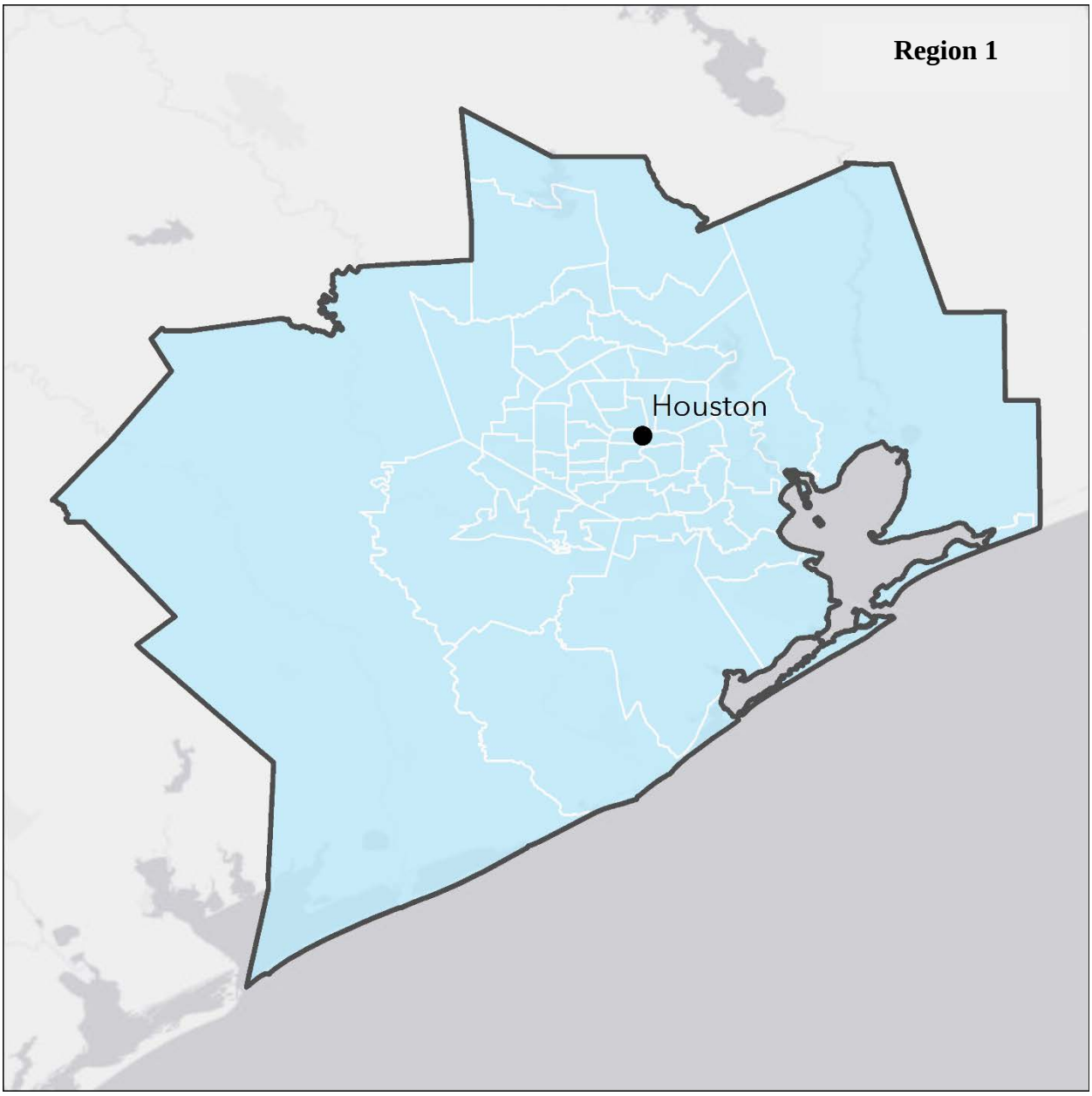
Region	High school degree or equivalent (e.g. GED)	Some college, no degree	Bachelor's degree (e.g. BA, BS)	Associate's degree (e.g. AA, AS)	Less than a high school diploma	Master's degree (e.g. MA, MS, MBA)	Doctorate (e.g. PhD, EdD)	Other
1-Houston Metropolitan	24%	31%	20%	12%	3%	5%	1%	2%
2-Dallas/Fort-Worth Metroplex	28%	30%	17%	15%	4%	4%		1%
3-San Antonio Area	31%	31%	17%	10%	6%	4%		1%
4-Captial Area	18%	28%	29%	9%	6%	9%		
5-West Texas	12%	38%	16%	25%	3%	3%		1%
6-Southwest Texas	33%	31%	16%	8%	5%	5%		1%
7-Corpus Christi Metropolitan	26%	38%	13%	6%	9%	7%		
8-East Texas	30%	36%	11%	11%	5%	3%	1%	1%
9-Texas Panhandle	23%	42%	15%	7%	5%	4%	2%	1%
10-West/Central Texas	29%	31%	13%	12%	6%	4%	1%	1%
11-Waco Area	22%	32%	19%	16%	1%	9%		
Texas	**26%**	**32%**	**18%**	**12%**	**5%**	**5%**	**1%**	**1%**

Table C83. Respondents Employment Status

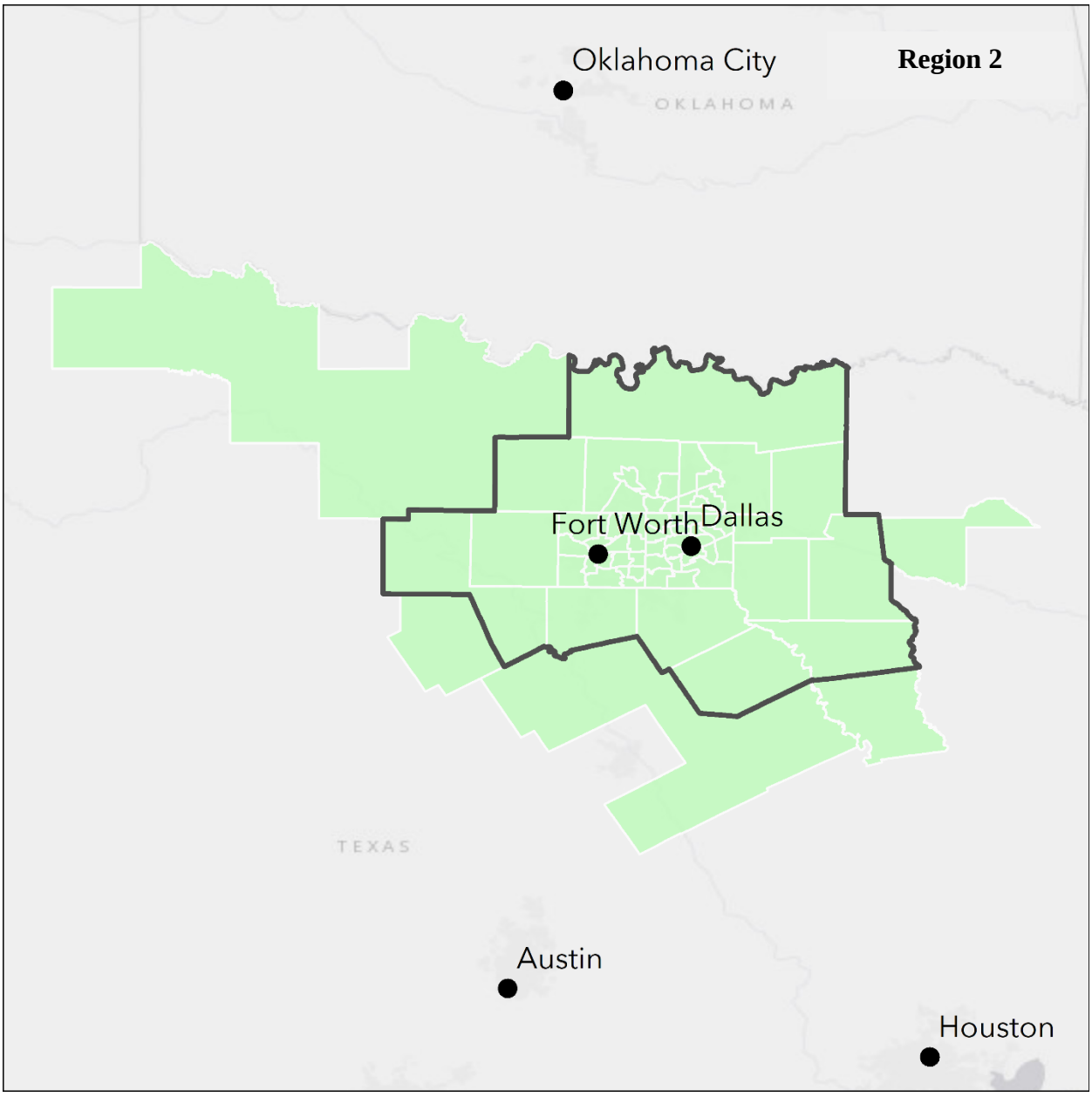
Region	Employed full time (40 or more hours per week)	Employed part time (up to 39 hours per week)	Self-employed	Unemployed and currently looking for work	Unemployed not currently looking for work	Student	Retired	Unable to work
1-Houston Metropolitan	33%	14%	6%	11%	8%	8%	14%	7%
2-Dallas/Fort-Worth Metroplex	32%	12%	7%	11%	7%	4%	19%	8%
3-San Antonio Area	37%	9%	6%	9%	9%	5%	14%	12%
4-Captial Area	33%	10%	9%	12%	7%	7%	13%	9%
5-West Texas	34%	14%	4%	11%	7%	8%	11%	10%
6-Southwest Texas	26%	12%	6%	21%	7%	9%	9%	10%
7-Corpus Christi Metropolitan	27%	26%	1%	7%	9%	10%	13%	7%
8-East Texas	22%	13%	9%	10%	5%	5%	18%	16%
9-Texas Panhandle	36%	9%	8%	9%	11%	5%	11%	11%
10-West/Central Texas	25%	12%	10%	13%	10%	7%	13%	12%
11-Waco Area	37%	14%	7%	9%	7%	9%	7%	10%
Texas	**32%**	**12%**	**7%**	**11%**	**8%**	**6%**	**14%**	**10%**

Appendix D. GIS Maps

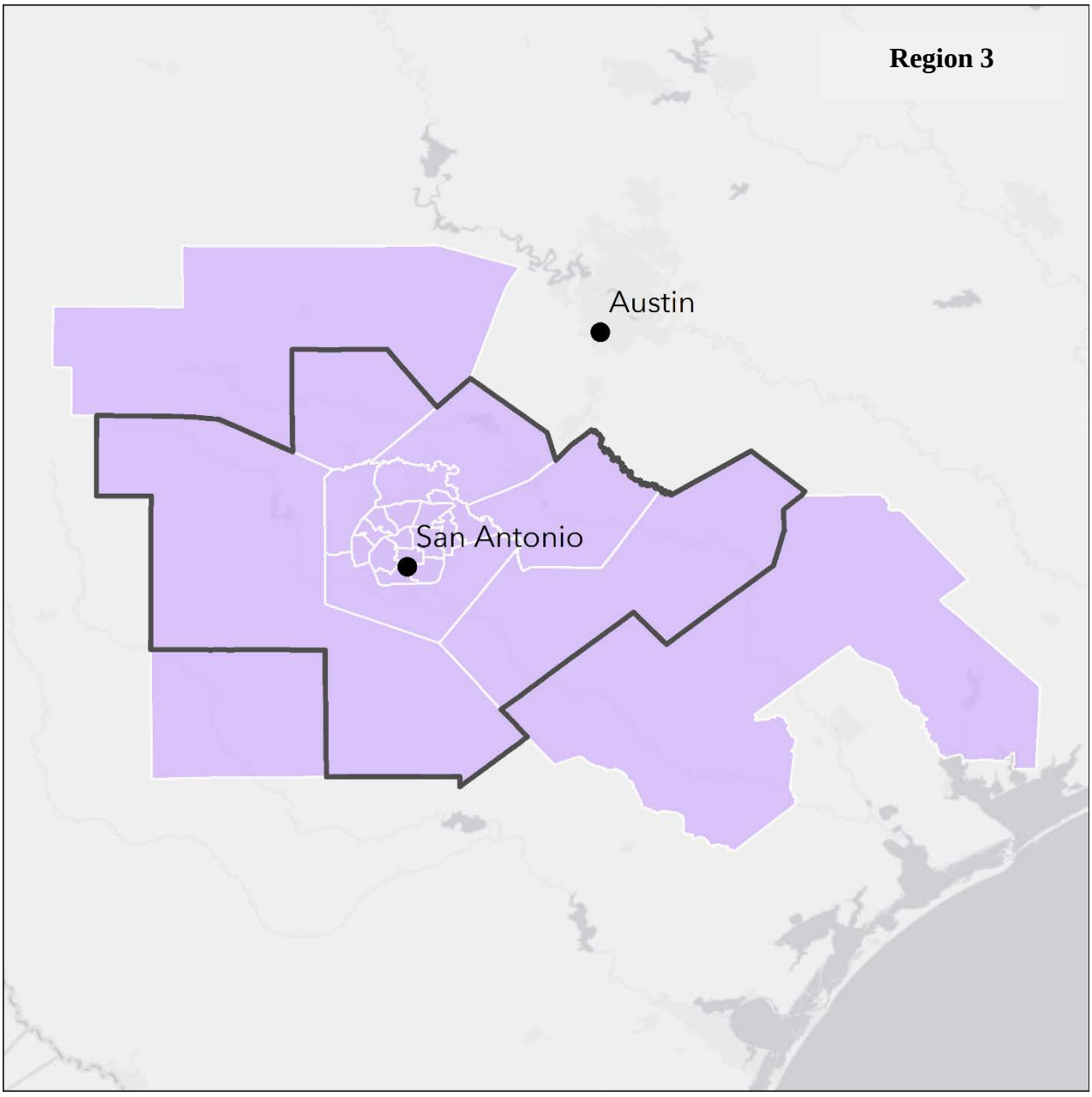
Region 1: Houston Area



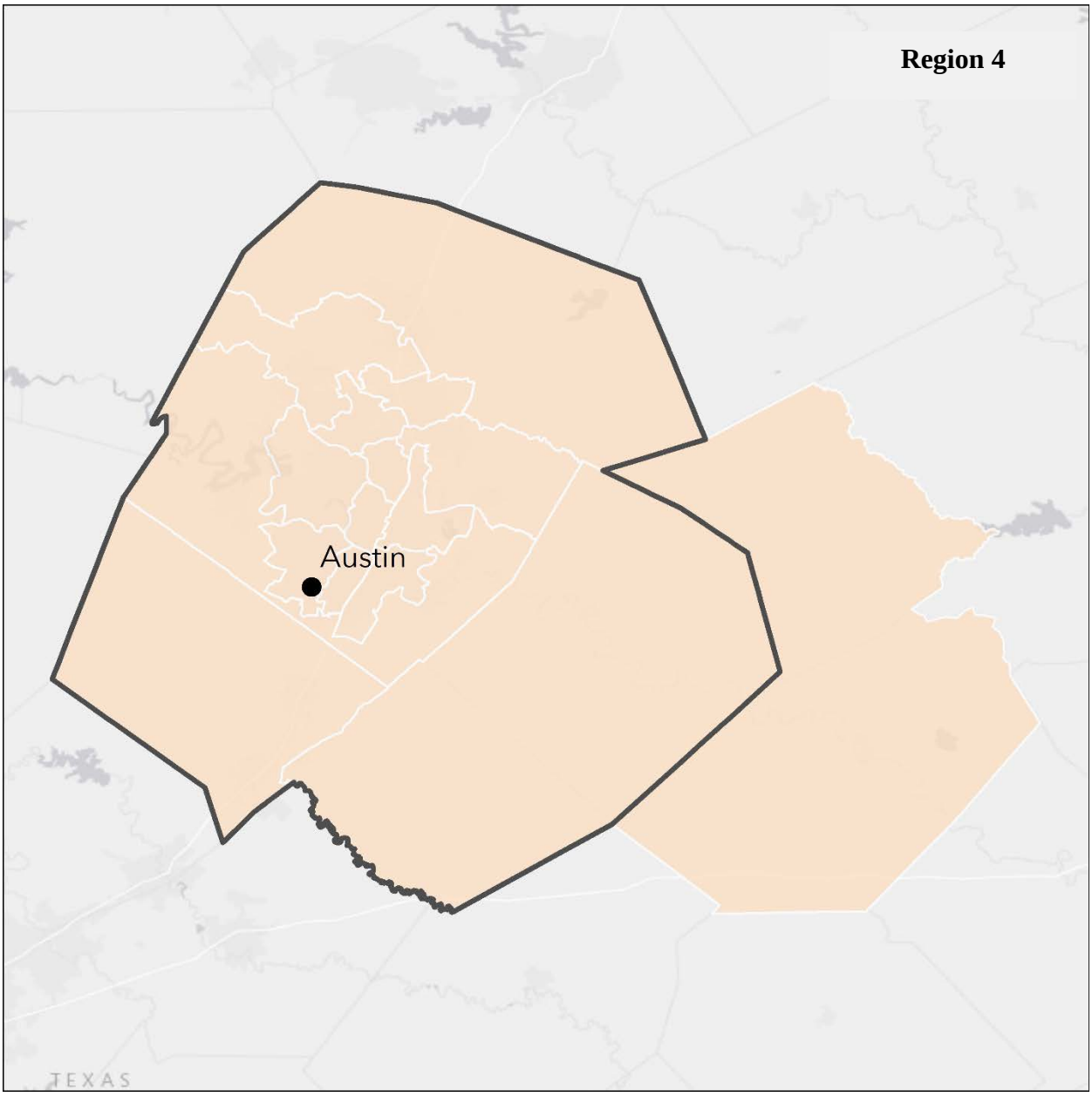
Region 2: Dallas/Fort-Worth



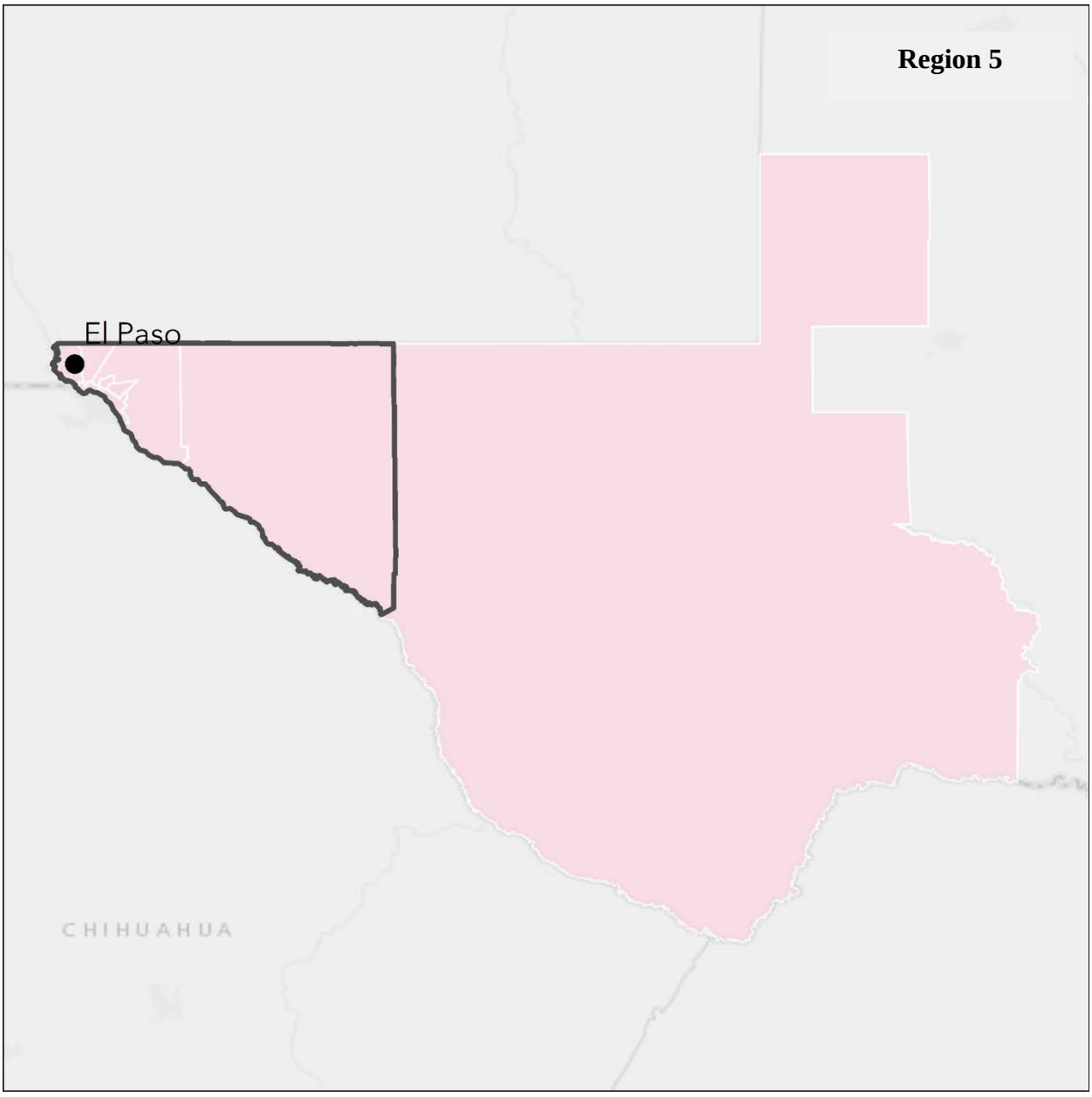
Region 3: San Antonio Area



Region 4: Austin Area

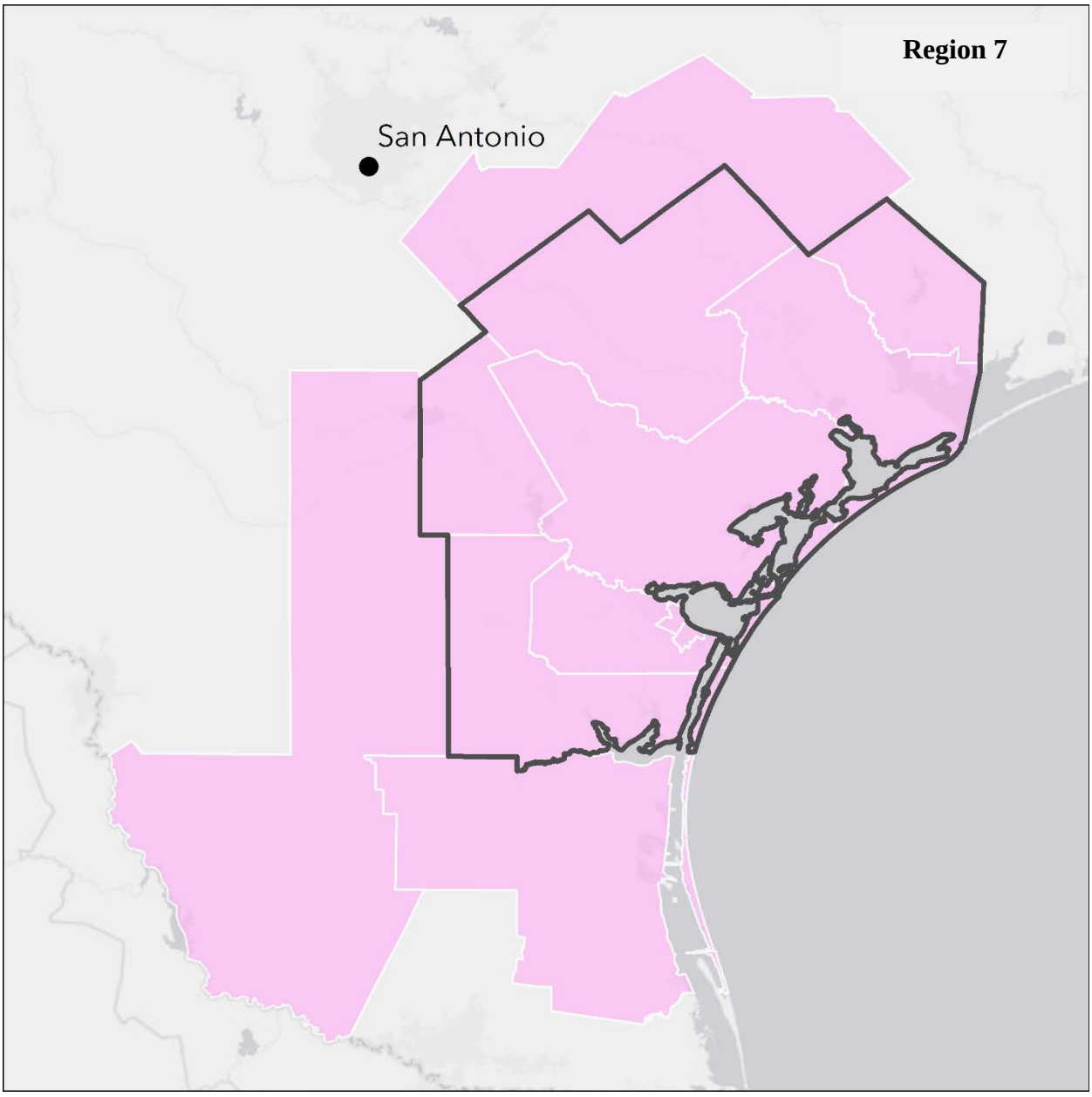


Region 5: El Paso Area

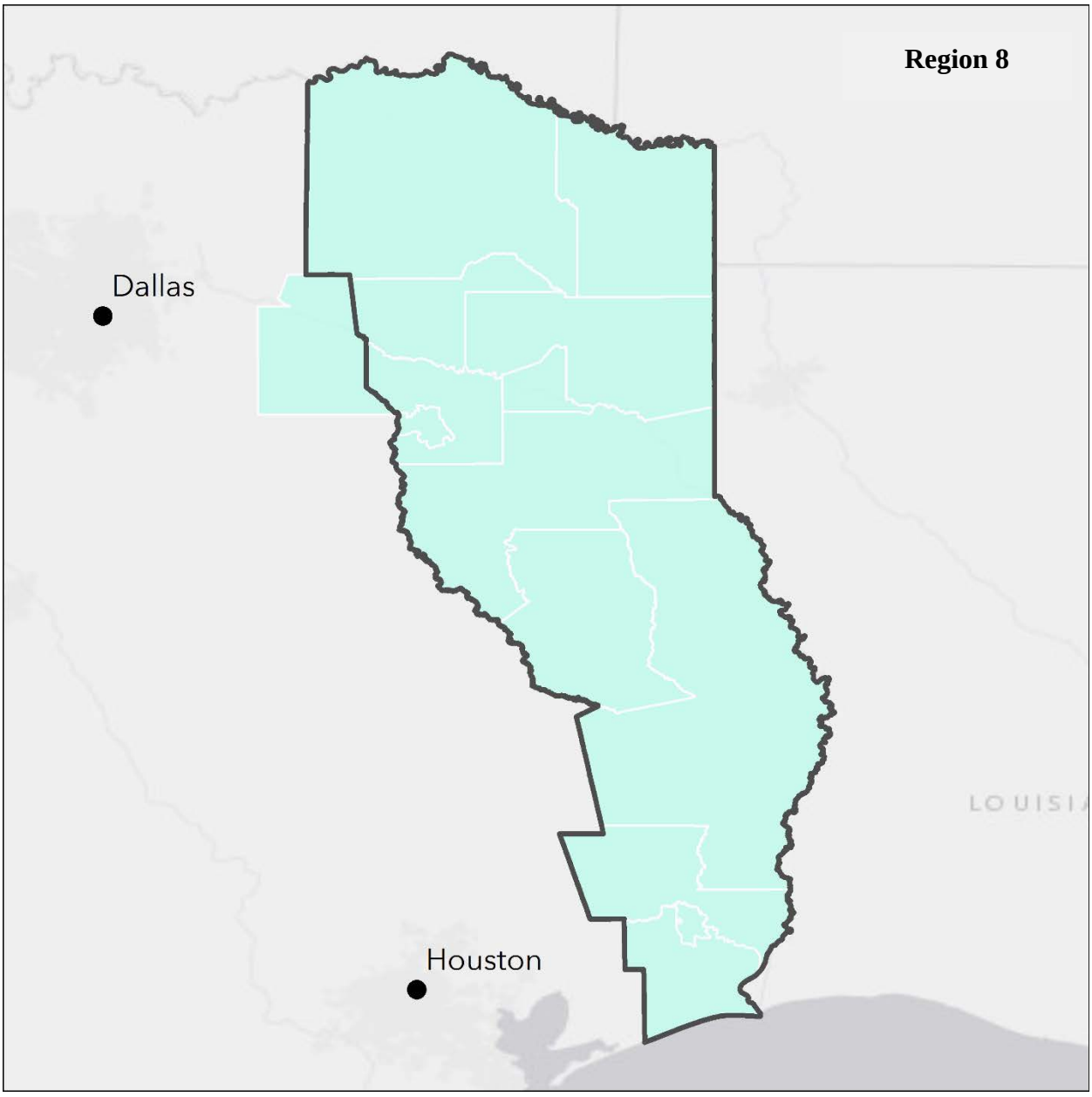


Region 6: Rio Grande Valley

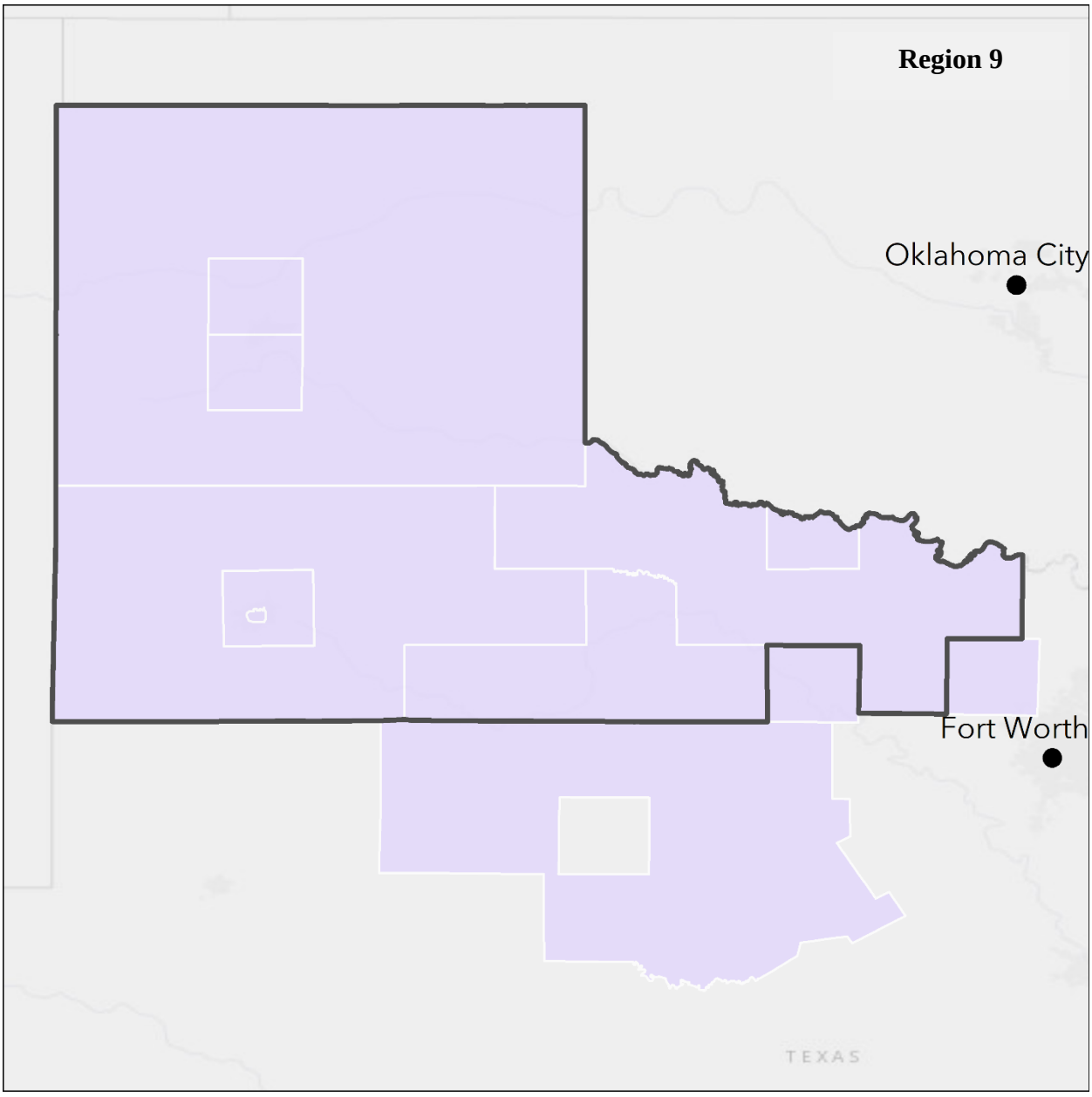
Region 7: Coastal Bend



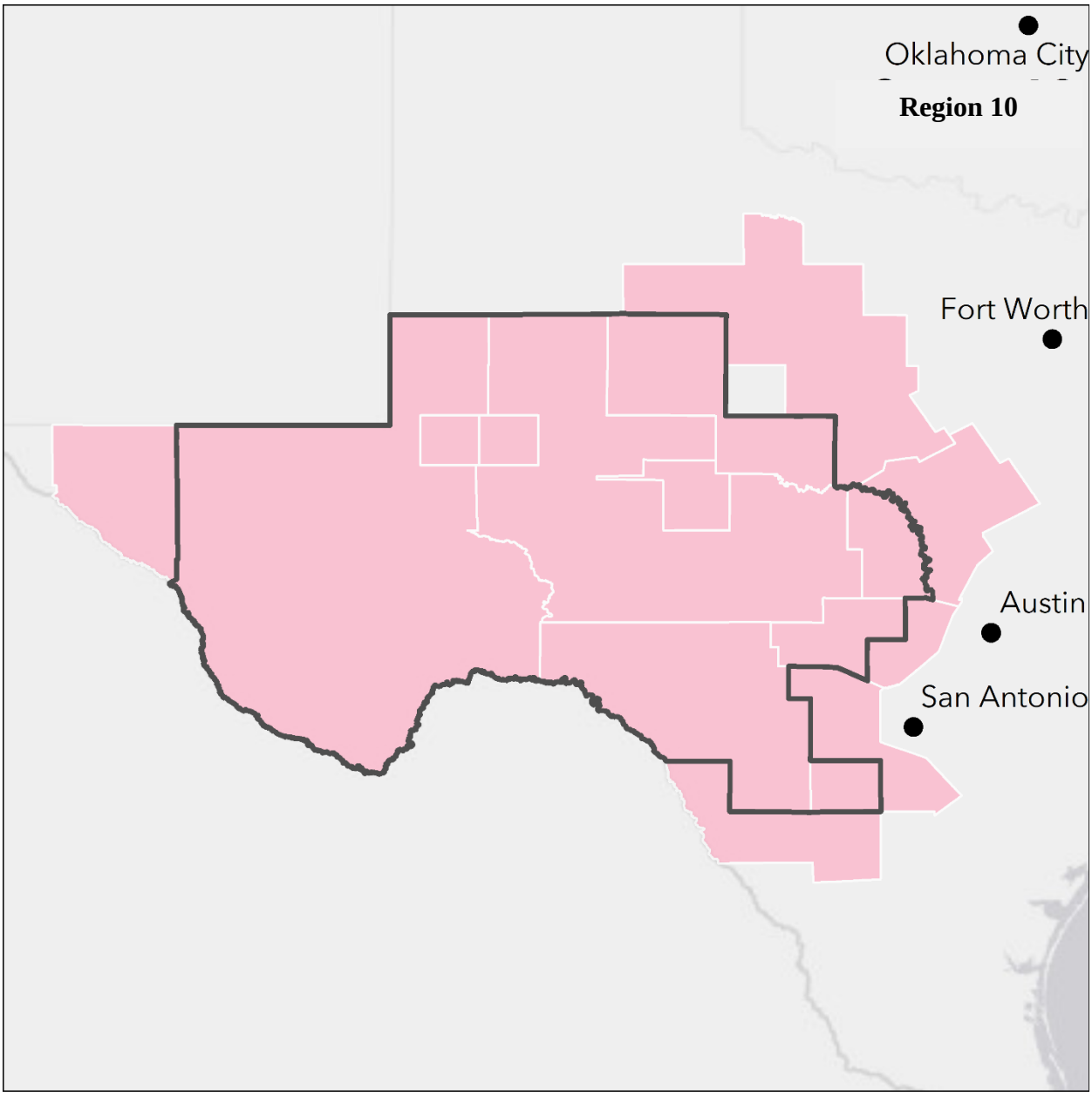
Region 8: East Texas



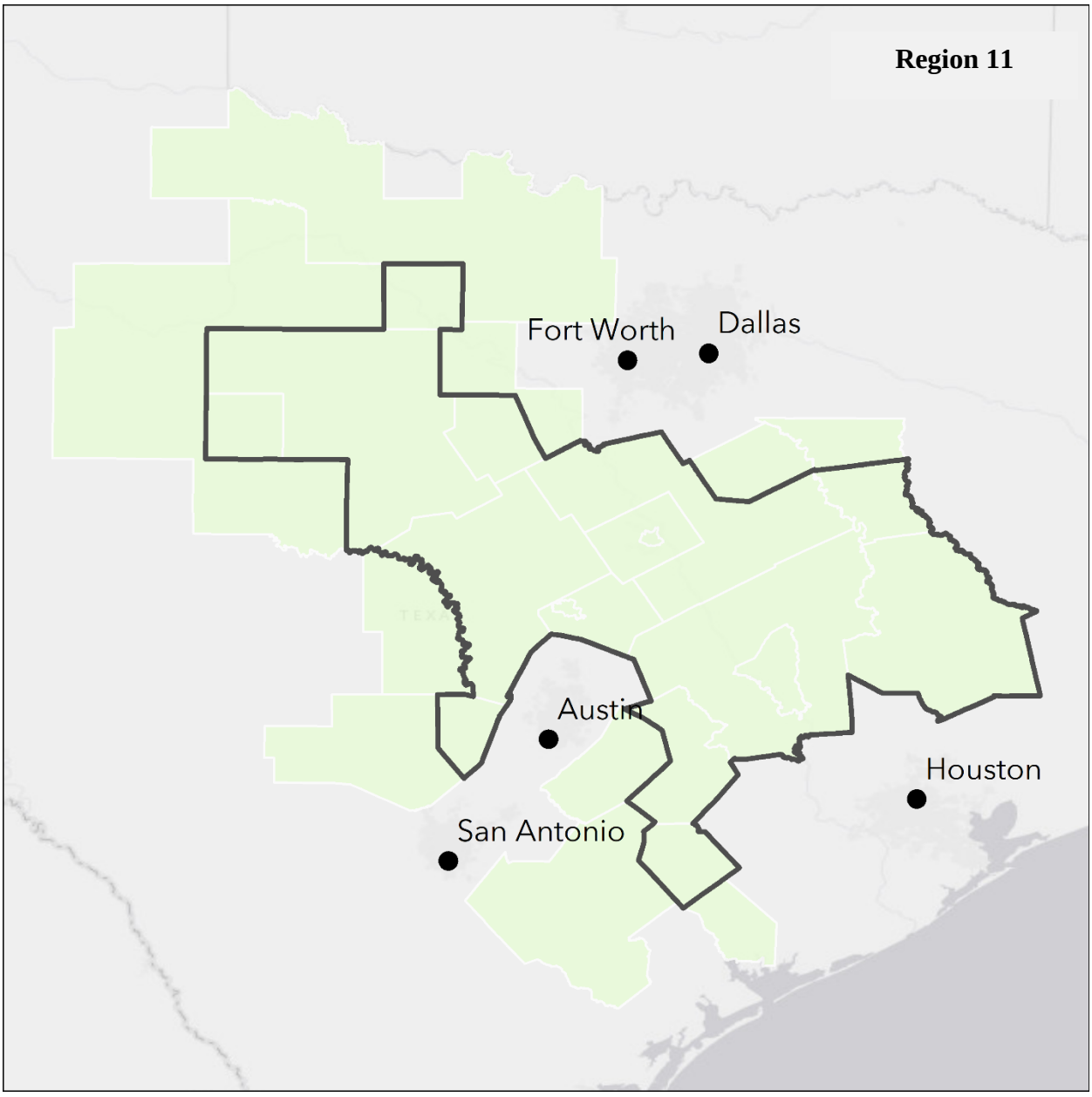
Region 9: Panhandle



Region 10: West Texas



Region 11: Central Texas



Endnotes

[i] Some describe the lack of affordability as “fuel poverty.”
[ii] Teller-Elsberg, J., Sovacool, B., Smith, T., & Laine, E. (2015) Fuel poverty, excess winter deaths, and energy costs in Vermont: Burdensome for whom? *Energy Policy*, 90, 81-91. http://dx.doi.org/10.1016/j.enpol.2015.12.009
[iii] Population trends suggest that the number of low-income families in Texas may increase in the next several years. Researchers can expect this to put more pressure on private and public funds. A look at these trends just for the Travis County area (Appendix B).
[iv] (University of Texas at Austin Energy Institute, 2016)
[v] (Renewable Energy Transition Initiative)
[vi] (Steemers & Yun, 2010)
[vii] (Baker, Blundell, & Micklewright, 1989)
[viii] (Druckman & Jackson, 2008)
[ix] (Austin Energy, Residential Electricity Burden, an Investigation of American Community Survey Data 2010)
[x] (Reames, 2016)
[xi] (Bednar et al, 2017)
[xii] (Valenzuela et. al, 2014)
[xiii] (Healy & Clinch, 2004)
[xiv] (Valenzuela, et al., 2014)
[xv] (Hernandez & Bird, 2010)
[xvi] (Gatersleben, Steg, & Vlek, 2002)
[xvii] (Baker, Blundell, & Micklewright, 1989)
[xviii] (Valenzuela, et al., 2014)
[xix] (Schipper, et al. 1989)
[xx] (Hernandez and Bird 2010)
[xxi] (University of Texas at Austin Energy Institute 2016)
[xxii] (Hernandez and Bird 2010)
[xxiii] (Brown and Wolfe 2007)
[xxiv] (Bhattacharya 2002)
[xxv] (Child Health Impact Working Group 2017)
[xxvi] (Baxter)
[xxvii] (Report on the Impacts and Costs of the Iowa Low-Income Weatherization Program - Calendar Year 2006)
[xxviii] (LIHEAP Case Study on Energy Burden for FY 2005)
[xxix] (Kaiser & Pulsipher 2006)
[xxx] World Health Organization, (2006), “Energizing the Millennium Development Goals.” *Fuel for Life: Household Energy and Health*, http://www.who.int/indoorair/publications/fuelforlife.pdf
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[xxxii] World Health Organization, “Global burden of disease due to indoor air pollution.” *Indoor Air Pollution*, http://www.who.int/indoorair/health_impacts/burden_global/en/
[xxxiii] World Health Organization, (2006), “Trapped by Energy Poverty.” *Fuel for Life: Household Energy and Health*, http://www.who.int/indoorair/publications/fuelforlife.pdf
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[xxxv] “Healthy Homes Barometer 2017: Buildings and Their Impact on the Health of Europeans,” VELUX, (2017), http://velcdn.azureedge.net/~/media/com/health/healthy-home-barometer/507505-01%20barometer_2017.pdf
[xxxvi] Ibid.
[xxxvii] Christine Liddell and Chris Morris, *Energy Policy* 2010, “Fuel poverty and human health: a review of recent evidence,” 38:2987–2997.
[xxxviii] “Healthy Homes Barometer 2017: Buildings and Their Impact on the Health of Europeans,” Ibid.

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[xli] Stefan Bouzarovski, (2014), "Energy poverty in the European Union: landscapes of vulnerability," *Wiley Interdisciplinary Reviews: Energy and Environment*, Volume 3, Issue 3, http://onlinelibrary.wiley.com/doi/10.1002/wene.89/full
[xlii] Ibid.
[xliii] Ibid.
[xliv] "European Fuel Poverty and Energy Efficiency," (2014), https://ec.europa.eu/energy/intelligent/projects/en/projects/epee
[xlv] Bouzarovski, Ibid.
[xlvi] Tirado Herrero and Bouzarovski, (2014) "Energy Transitions and Regional Inequalities in Energy Poverty Trends: Exploring the EU Energy Divide"
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[xlviii] Moore, R. (2012). Definitions of fuel poverty: Implications for policy. Energy Policy, 49, 19-26.
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[lix] Ibid., p. 21-25
[lx] Ibid., pg. 24
[lxi] European Commission (2015), ibid., p.44
[lxii] Ibid., p. 57
[lxiii] Ibid., p.105
[lxiv] Source: Instructions for Applying Statistical Testing to the 2011-2015 ACS 5-Year Data. https://www2.census.gov/programs-surveys/acs/tech_docs/statistical_testing/2015StatisticalTesting5year.pdf
[lxv] Lanjouw, P., and Ravallion, M. (November 1995), *Poverty and Household Size*, The Economic Journal, Vol. 105, No. 433, pp. 1415-1434
[lxvi] Source: United States Census Bureau, FactFinder 2016 Estimates
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