

The Effects of the Winter Storm of 2021 in Harris County

HOBBY
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Introduction

Winter Storm Uri began to hit parts of Texas on February 13, 2021 and its onslaught left close to 4.5 million homes and businesses without power at its peak. The preliminary number of deaths attributed to the storm is nearly 200, including 66 in Harris County alone, and the storm's economic toll is estimated to be as high as \$295 billion. And all the while, people continued to live under pandemic conditions wrought by COVID-19.

In order to study Winter Storm Uri's impact on Texas, the Hobby School of Public Affairs at the University of Houston conducted an online survey of residents 18 and older who live in the 213 counties (91.5% of the state population) served by the Texas Electrical Grid, which is managed by the Electrical Reliability Council of Texas (ERCOT). The survey documents Texans' experiences during the storm and explores preferences among potential changes in policies regarding electricity and energy more generally. It also examines opinions about the lifting of statewide COVID-19 restrictions. The survey was fielded by YouGov between March 9-19, 2021 with 1,500 YouGov respondents, resulting in a confidence interval of +/-2.5. The respondents were matched to a sampling frame on gender, age, ethnicity/race, and education and are representative of the adult population in these 213 counties.

The results of the statewide (213 counties) survey were presented in two individual reports: [Lifting the COVID-19 Restrictions](#) and the [Winter Storm of 2021](#). An oversample of 513 Harris County residents (with a confidence interval of +/-4.3) also was collected, with these findings on the winter storm in Harris County provided in this third report.

Harris County (Houston) has a population of 4.8 million, more than that of 26 U.S. states. It is far and away the most populous county in Texas, and ranks third in the United States, behind only Los Angeles County and Cook County (Chicago). And, Harris County's population is expected to eclipse that of Cook County by 2030. In terms of geographic size, Harris County spans an expansive 1,777 square miles.

As mentioned above, the survey population is representative of the Harris County population 18 and older. The survey population is split almost evenly between women (51%) and men (49%). Slightly more than two-fifths (41%) of the population is Latino, 33% is Anglo, 19% is African American, with 7% identifying with a different ethnic or racial group. The generational distribution of the population is: Silent Generation (born 1928-1945) 3%, Baby Boomers (1946-1964) 28%, Generation X (1965-1980) 23%, Millennials (1981-1996) 35%, and Generation Z (1997- 2012) 11%.

The highest educational attainment of two-fifths of the survey population is a high school degree or less, with 29% possessing either a two-year college degree or having attended some college, and another 29% whose highest level of educational attainment is either a four-year college degree or a postgraduate degree. Almost two in five (38%)

of the respondents identifies as a Democrat, 36% identify as Independent, and 17% identify as Republican, with the remaining 9% either not knowing what their partisan identification is (6%) or identifying with another party, movement, or group (3%).

Executive Summary

More than half of Harris County residents prepared for the winter storm by buying additional bottled water (65%) and food (64%), filling their vehicle with gas (59%), covering or moving outside plants (55%), and storing tap water (53%).

Before, during and immediately after the winter storm, more than half of Harris County residents relied either a great deal, somewhat, or a little on four sources of information: Local TV news (70%), neighbors and friends (62%), local government text alerts (56%), and The Weather Channel (51%). The most relied upon (a great deal or somewhat) sources of information were local TV news (54%), local government text alerts (40%), The Weather Channel (35%), and local radio news (32%).

Harris County residents were significantly more likely than other Texans to say they relied at least a little on local government text alerts for information about the storm, 56% to 31%, suggesting other Texas counties and cities may want to examine the text alert programs employed by Harris County and the City of Houston.

More than nine out of every ten (91%) Harris County residents lost electrical power at some point during the winter storm (February 14-20), a proportion that is significantly higher than that found in the other 212 counties (64%) within the Texas electrical grid.

The average Harris County resident who lost power was without it for 49 hours, with the largest consecutive number of hours during which they were without power being on average 39, underscoring that there was nothing “rotating” about the power blackouts suffered by a substantial majority of Harris County residents.

Almost two-thirds (65%) of Harris County residents were left without running water at some point during the week of February 14-20, a proportion that is significantly higher than that experienced by Texans outside of Harris County (44%).

Residents who lost running water in Harris County were without it for an average of 56 hours during the week of February 14-20, and even residents with running water did not have potable water for an average of 57 hours.

During the week of the winter storm, Harris County residents were significantly more likely than other Texans to lose electrical power, lose internet service, lose access to drinkable water, be without running water, lose cell phone service, have food spoil, suffer economic damages, and experience difficulty finding a plumber.

Two-thirds of Harris County residents who lost electrical power (74%) or access to running water (71%) considered this loss to be either extremely serious or very serious.

Two in five (38%) of Harris County residents suffered water damage from burst pipes as a result of the winter storm. But, only a third (35%) consider it to be either very likely or somewhat likely that insurance will cover the full cost of these damages.

One-quarter (26%) of those Harris County residents who lost power left their home. The most common destination was a local relative's home (52%) followed by a local friend's home (18%) and a local hotel or motel (14%). Only 2% of the 26% went out of state or abroad to escape the adverse conditions in Harris County the week of February 14-20.

Among those residents who remained in their home without power, the most common method utilized to stay warm (by 34%) was to use a natural gas oven or cooktop. In spite of the risk of carbon monoxide poisoning, 9% of Harris County residents used a grill or smoker indoors while 8% used an outdoor propane heater indoors.

Three-fourths (75%) of Harris County residents believed that they would have benefited from more timely and accurate information before, during, and after the winter storm.

More than two-thirds (71%) of Harris County residents do not believe that the cuts in electrical power in their area were carried out in an equitable manner.

Harris County residents were asked to evaluate the job performance (including communication with the public) of a set of 11 elected officials, governments, and entities during the winter storm. The proportion who approve of the performance of the individuals, government or entities range from highs of 49% (President Joe Biden) and 48% (Harris County Judge Lina Hidalgo), to lows of 12% (the Public Utility Commission [PUC] of Texas) and 9% (ERCOT, the Electric Reliability Council of Texas).

Two-thirds or more of Harris County residents support seven proposed policies to safeguard the state from the effects of severe weather on its energy supply and delivery: require electricity generators to fully winterize/weatherize their plants (73%), require the PUC to review, inspect and approve all weatherization efforts by electric generation companies (73%), require natural gas pipeline companies to fully weatherize (72%), increase the cap on utility company penalties (71%), upgrade building codes to make new construction more climate resilient (69%), require electricity generators to maintain more reserve capacity (68%), and adopt a solar bill of rights (66%).

Less than one-third of Harris County residents support allowing electricity generators (21%) or natural gas companies (32%) to charge consumers a fee to pay for weatherization or a fee to pay for an increase in electricity reserve capacity (25%).

76% of Harris County residents agree that due to climate change, Texas is today more likely to be adversely affected by severe weather than was the case 30 years ago.

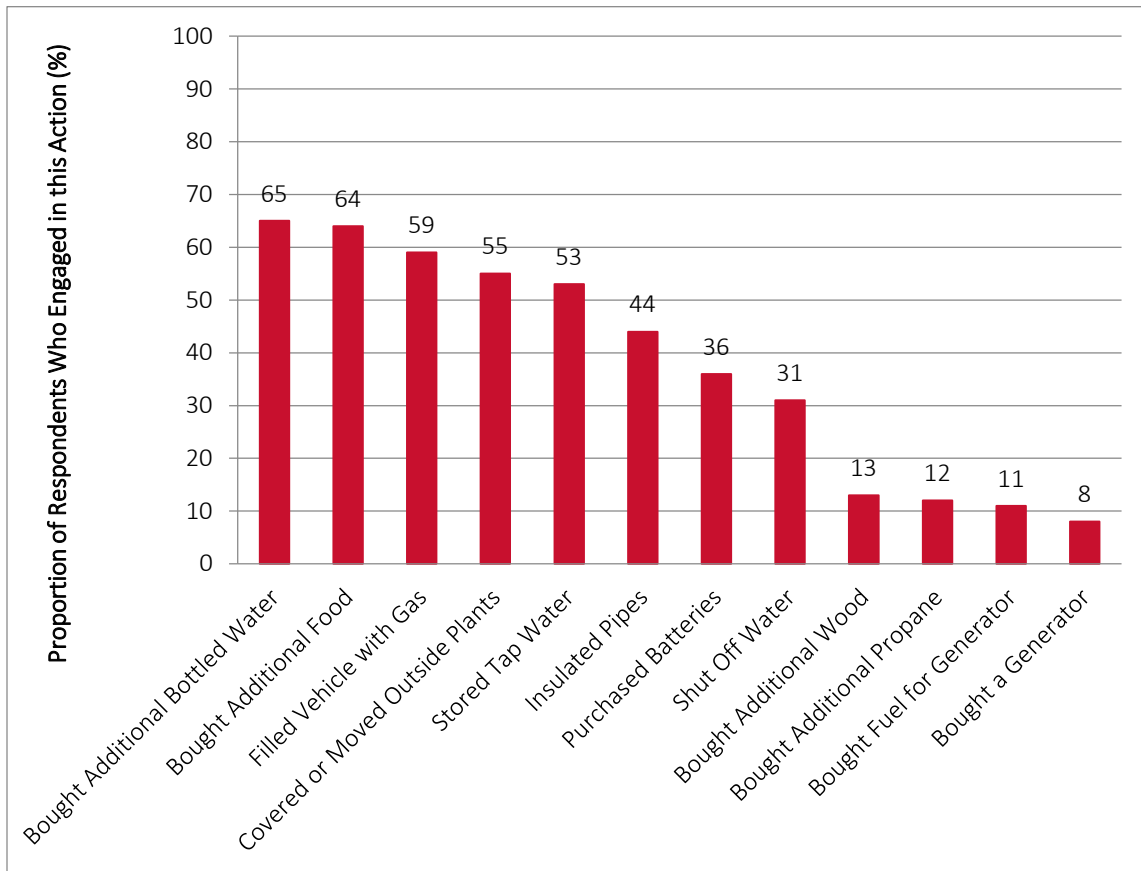
73% of Harris County residents believe that the most important priority for addressing America's energy supply is to develop alternative sources such as wind and solar, compared to 27% who believe the priority should be expanding the exploration and production of oil and natural gas. Meanwhile, 56% of other Texans favor developing alternative sources of energy and 44% favor expanding oil and natural gas production.

An absolute majority of Harris County residents favor expanding five sources of energy in the United States: solar, wind, geothermal, hydrogen, and hydroelectric. In contrast to these renewable sources that enjoy majority support, a plurality of Harris County residents favors reducing three energy sources: coal, fracking, and offshore drilling for oil and natural gas.

Preparing for the Winter Storm

The survey respondents were asked that as they prepared for the winter storm, if they did any of 12 specific things. The results are displayed in Figure 1, arranged from the most common preparation among these Harris County residents to the least common.

Figure 1. Most to Least Common Ways Harris County Residents Prepared for the 2021 Winter Storm



More than half of Harris County residents prepared for the winter storm by buying additional bottled water (65%) and food (64%), filling their vehicle with gas (59%), covering or moving outside plants (55%), and storing tap water (53%). The next most common preparations, engaged in by more than three in ten Harris County residents, were insulating the pipes in their home (44%), purchasing batteries (36%), and shutting off the water in their home (31%). Approximately one in ten bought additional wood (13%), additional propane (12%), gasoline or diesel fuel for a portable generator (11%), and/or a generator (8%)

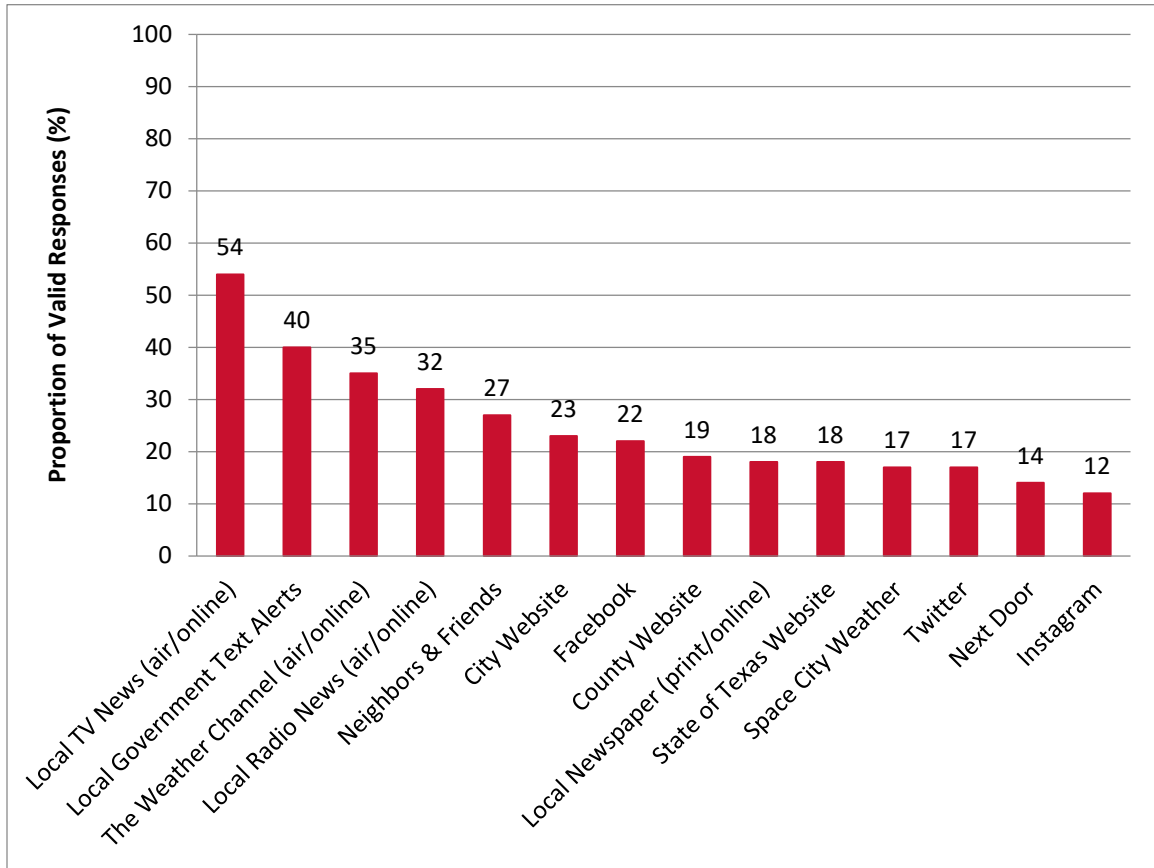
As Harris County residents prepared for the winter storm, were in its midst, and were recovering from its aftermath, they consulted a wide range of sources of information. The survey asked them the extent to which during this period they relied a great deal, somewhat, a little, or not at all on 13 different sources for information related to the winter storm. The results are displayed in Table 1 on page 7. More than half of Harris County residents relied either a great deal, somewhat, or a little on four sources of information: Local TV news (70%), neighbors and friends (62%), local government text alerts (56%), and The Weather Channel (51%). In contrast, less than a third of Harris County residents relied in any amount on a State of Texas website (31%), Next Door (30%), Space City Weather (25%), Twitter (25%), and Instagram (22%) for winter storm information. Harris County residents were significantly more likely than other Texans to say that they relied at least a little on local government text alerts for information about the storm, 56% to 31%, suggesting that other Texas counties and cities may want to examine the text alert programs employed by Harris County, the City of Houston, and, perhaps also, other local government entities within Harris County.

Figure 2 on page 8 displays the sources of information arrayed based on the proportion of Harris County residents who relied on them either a great deal or somewhat for information before, during, and in the aftermath of the winter storm. The most relied upon sources of information were local TV news (54% relied on it either a great deal or somewhat), local government text alerts (40%), The Weather Channel (35%), and local radio news (32%). More than one-in-five Harris County residents also relied for winter storm information a great deal or somewhat on neighbors and friends (27%), a city government website (23%), and Facebook (22%). Only between one in five and one in ten Harris County residents relied a great deal or somewhat on a county government website (19%), a local newspaper (18%), a state of Texas government website (18%), Space City Weather (17%), Twitter (17%), Next Door (14%), and Instagram (12%) as a source for information on the winter storm.

Table 1. Harris County Resident Reliance on Different Sources for Information on the Storm and Coping in its Aftermath

Information Source	Percentage Distribution (%)				
	A Great Deal	Somewhat	A Little	Not At All	Don't Know
Local TV News (on air & online)	34	20	16	24	6
The Weather Channel (on air & online)	18	17	16	42	7
Local Radio News (on air & online)	14	18	15	48	5
Neighbors & Friends	13	24	25	33	5
Local Government Text Alerts	13	26	17	39	5
City Website	10	12	14	57	7
Facebook	9	13	13	60	5
State of Texas Website	9	9	13	62	7
Space City Weather	8	9	8	63	13
Twitter	7	10	8	66	9
County Website	6	13	14	56	11
Next Door	6	8	16	64	6
Local Newspaper (print & online)	6	11	12	64	7
Instagram	5	7	10	72	6

Figure 2. Proportion of Harris County Residents Who Relied a Great Deal or Somewhat on the Source for Information About the Storm and Coping with its Aftermath



Loss of Power and Water During the Winter Storm

Figure 3 highlights that more than nine out of every ten Harris County residents (91%) lost electrical power during the winter storm (between February 14-20), while almost two-thirds (65%) were left without running water during this same period of time. This compares to a little more than six out of ten (64%) of other Texans within the Texas Electrical Grid who lost electrical power during this same period, and 44% of these other Texans who were left without running water at some point between February 14-20. In sum, Harris County residents were significantly more likely than other Texans to both lose electrical power and access to running water as a result of the winter storm of 2021.

Figure 3. In Harris County, Did You Lose Electrical Power or Were You Without Running Water at Any Time During the Winter Storm?

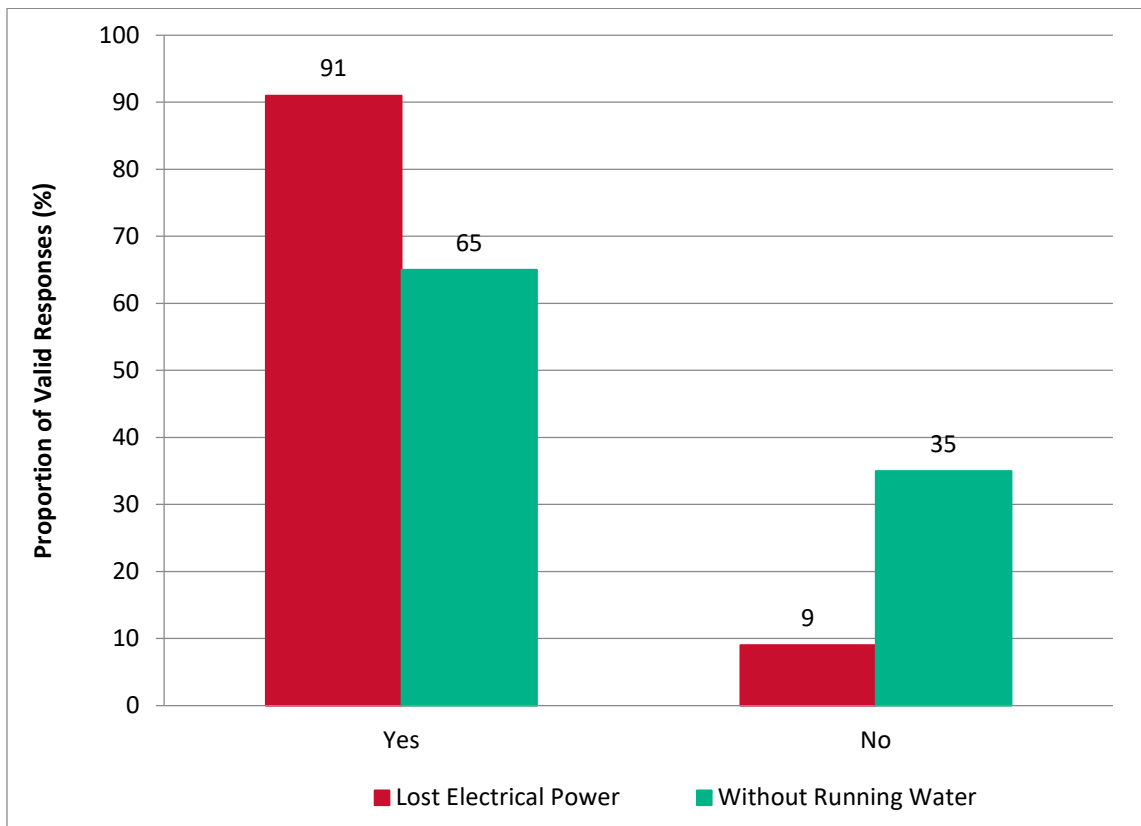


Figure 4. The Distribution of the Number of Total Hours Those Who Lost Power Were Without Electricity

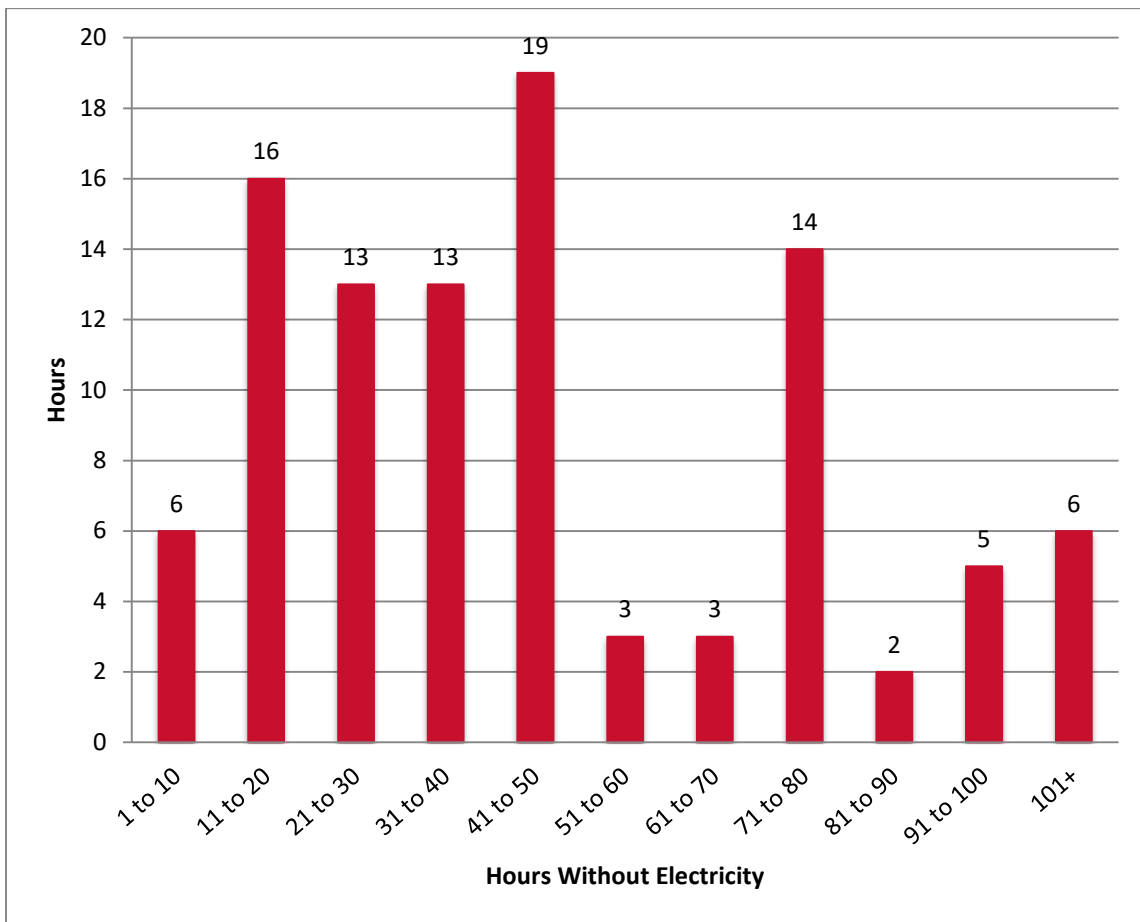
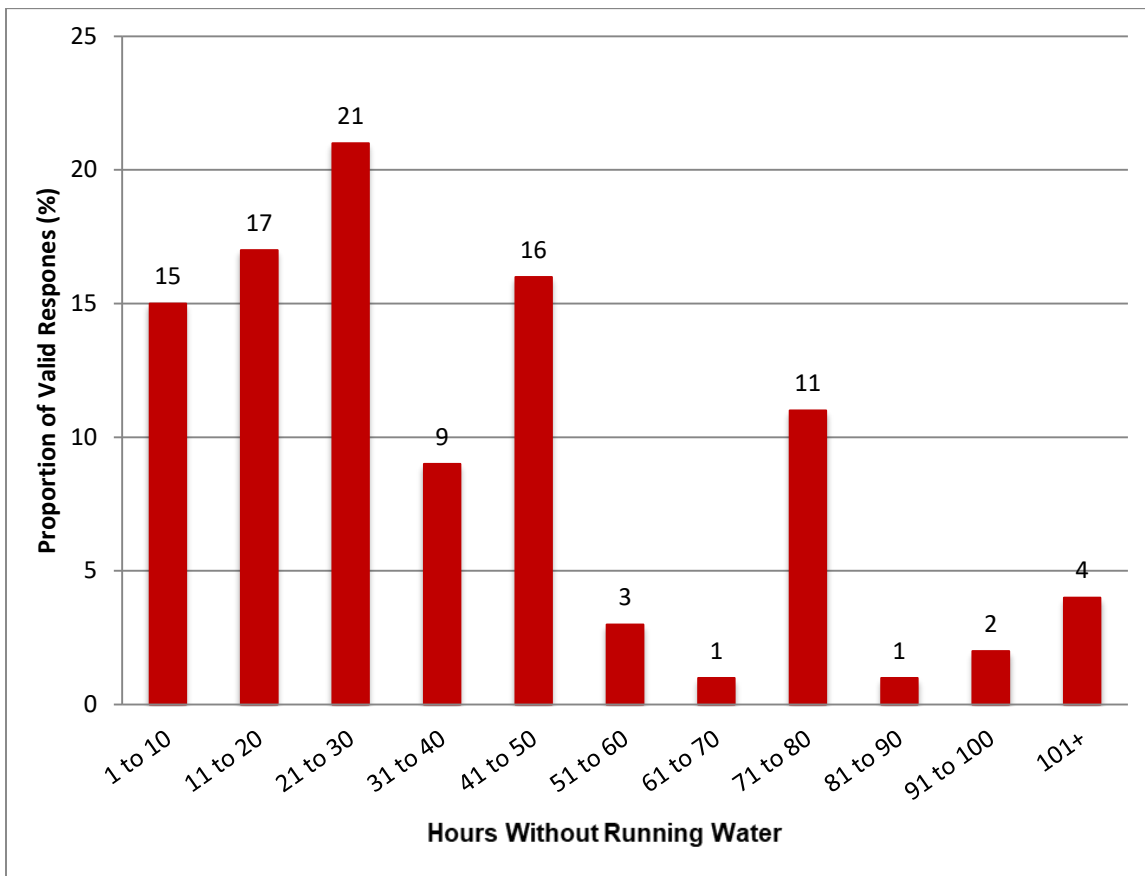


Figure 4 displays the average number of hours that the 91% of Harris County residents who lost power at some point during the winter storm were without power. These local residents were without electrical power for a mean average of 49 hours (and a median of 42 hours) during the week of February 14-20.

Figure 5. Longest Consecutive Number of Hours That the 91% of Harris County Residents Who Lost Power Were Without Electricity



The longest consecutive number of hours that Harris County residents were without power was on average 39 (with a median of 30 hours), underscoring that the bulk of the outage hours experienced by Harris County residents (as was the case for other Texans) occurred in a single continuous period, very distinct from what would have been the case had the power outages been rotating as suggested by initial reports. Figure 5 displays the distribution of the longest single bloc of time during which the respondent did not have electrical power. More than three-fifths of those Harris County residents who lost electrical power were without it for a consecutive time period of 24 hours or more between February 14-20.

Figure 6. The Distribution of the Hours That Those Who Lost Running Water Were Without Water

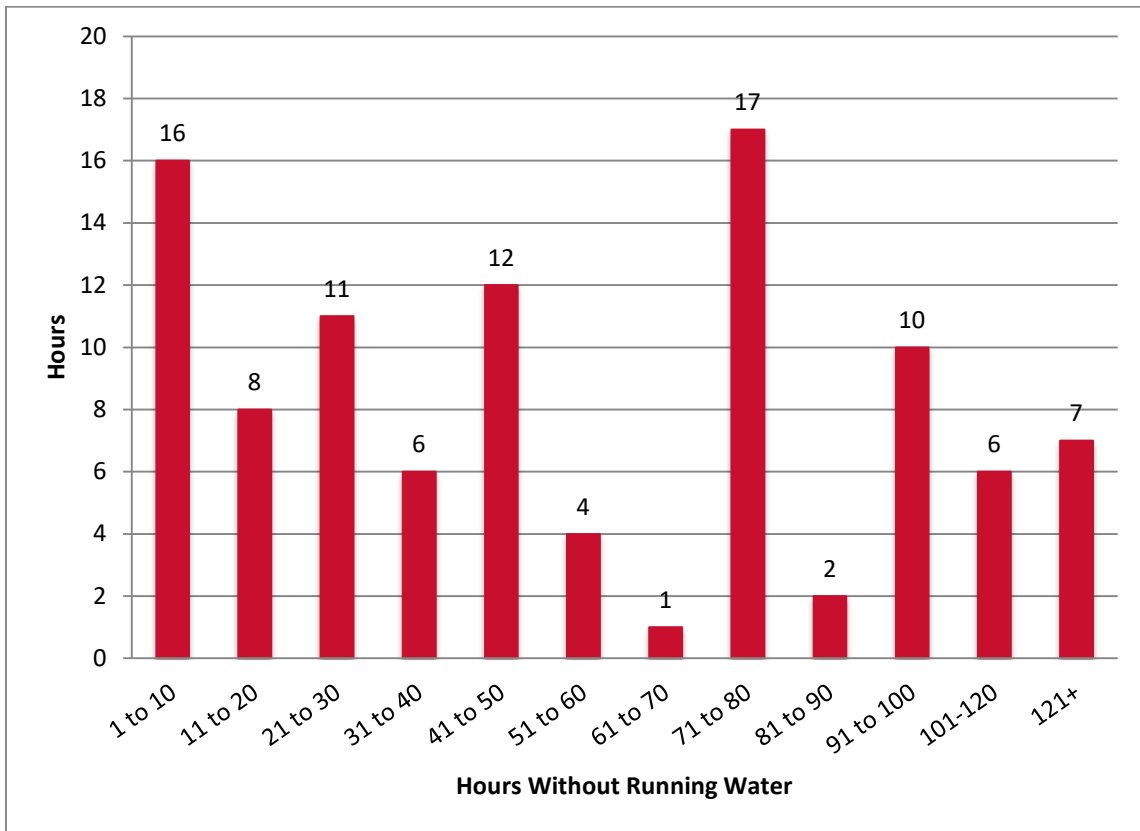
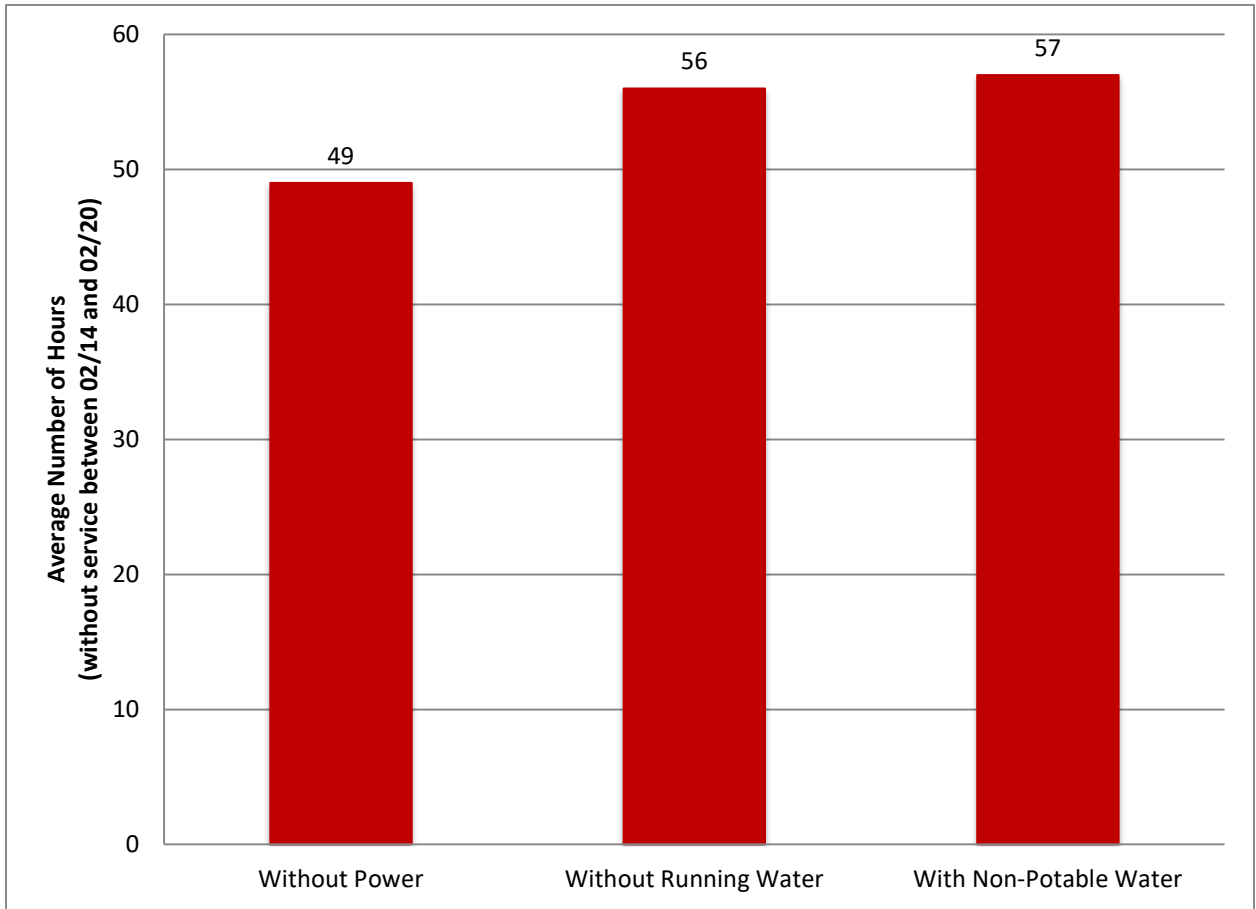


Figure 6 provides the detailed distribution of the hours during which the almost two-thirds of Harris County residents who were without running water did not have it. Those Harris County residents did not have running water for an average of 56 hours and a median of 48 hours.

While the loss of all water service was a problem faced by a majority of Harris County residents, the average resident who did have access to running water during the week of the storm did not have access to potable water for a mean average of 57 hours (see Figure 7 on page 13) and a median of 48 hours during the February 14-20 period.

Figure 7. Average Number of Hours That Harris County Residents Were Without Power, Running Water, or Water that Was Potable Were Without This Service



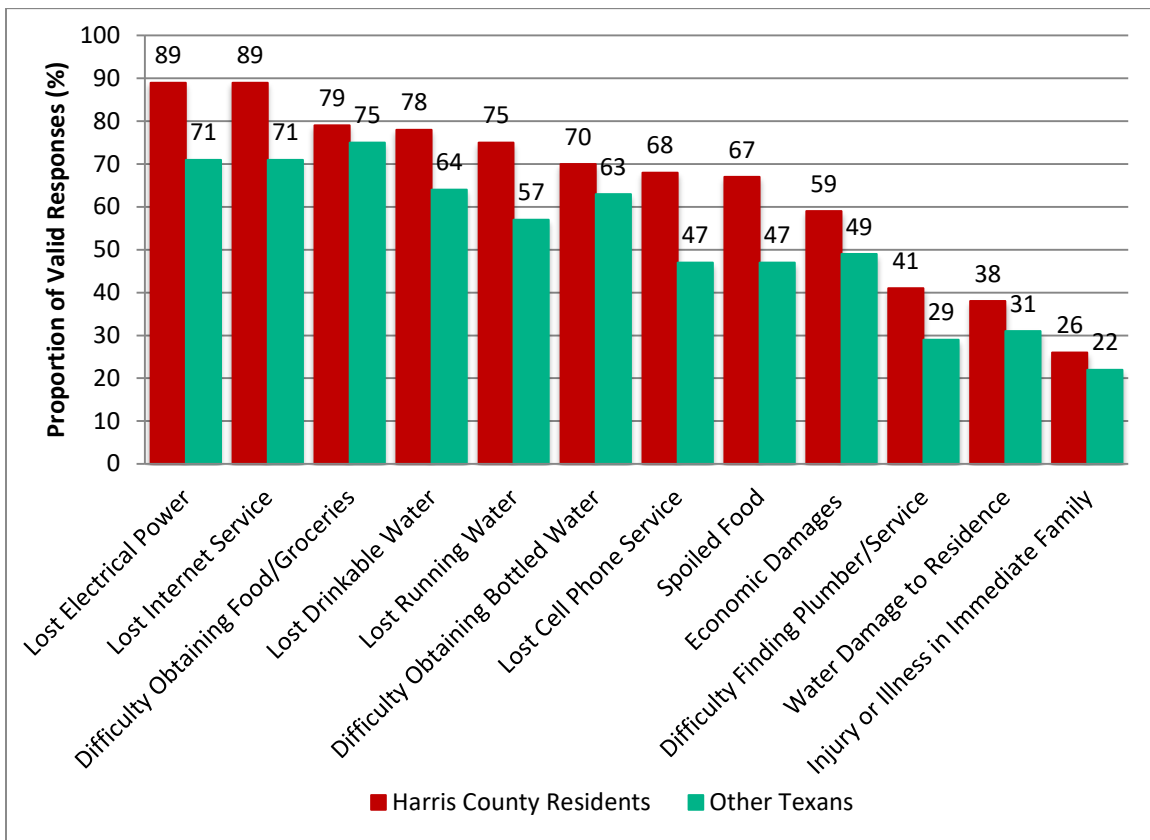
The Impact of the Winter Storm on Harris County Residents

Harris County residents were asked the extent to which they experienced a dozen possible negative winter storm experiences between February 14-20 (see Table 2). Figure 8 on page 15 details the percentage of Harris County residents and of those other Texans residing outside of Harris County, who suffered each negative experience, ranging from the most to the least common (in Harris County). Due to the phrasing and structure of the questions, we consider the data in Figure 3 on page 9, which provides outage values slightly different than those in Figure 8, to be the most accurate reflection of the reality of Harris County residents during the storm.

Table 2. The Prevalence and Severity of Events and Experiences in Harris County During the Winter Storm

Event/Experience	Percentage Distribution (%)				
	Not Applicable	Extremely Serious	Very Serious	Somewhat Serious	Not Serious
Lost Electrical Power	11	42	24	17	6
Lost Internet Service	11	23	24	26	16
Difficulty Obtaining Food/Groceries	21	15	18	29	17
Lost Drinkable Water	22	29	21	18	10
Lost Running Water	25	28	25	17	5
Difficulty Obtaining Bottled Water	30	16	17	21	16
Lost Cell Phone Service	32	20	15	21	12
Spoiled Food	33	16	13	21	17
Economic Damages	41	13	16	21	9
Difficulty Finding Plumber/Service	59	13	11	11	6
Water Damage to Residence	62	11	9	10	8
Injury or Illness in Immediate Family	74	5	2	11	8

Figure 8. Negative Winter Storm Experiences Among Harris County Residents & Other Texans



More than two-thirds of Harris County residents report having lost electrical power (89%, vs. 71% of other Texans), lost internet service (89%, vs. 71%), had difficulty obtaining food or groceries (79%, vs. 75%), lost access to drinkable water (78%, vs. 64%), lost running water (75%, vs. 57%), had difficulty obtaining bottled water (70%, vs. 63%), lost cell phone service (68%, vs. 47%), and had food spoil (67%, vs. 47%) during this same one-week period. These results indicate that during the week of the winter storm, Harris County residents were significantly more likely than other Texans to lose electrical power, lose internet service, lose access to drinkable water, be without running water, lose cell phone service, and have food spoil.

More than one-half of Harris County residents suffered economic damages (59%, vs. 49% of other Texans) during this time period and more than two-fifths faced difficulty finding a plumber or other service professional (41%, vs. 29%) and more than one-third suffered water damage to their residence (38%, vs. 31%), while one in four (26%, vs. 22%) experienced a storm-related injury or illness within the immediate family. During this period, Harris County residents were significantly more likely than other Texans to suffer economic damages from the winter storm and to experience difficulty finding a plumber or other service professional.

Respondents who had each of the negative experience were queried on the extent to which it was extremely serious, very serious, somewhat serious, or not serious at all. Figure 9 contains the proportion of those who suffered the negative experience who considered that experience to be either extremely serious or very serious.

Figure 9. Among the Affected Population in Harris County, Those Who Consider Effect to be Extremely Serious or Very Serious

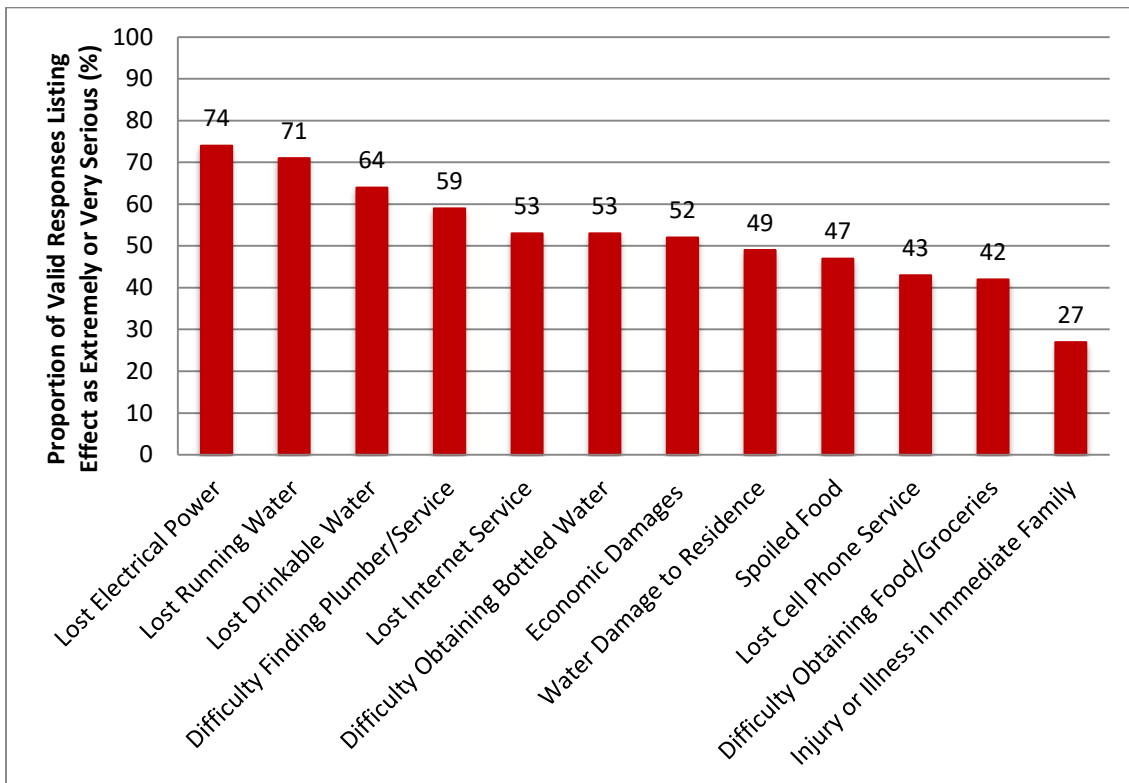


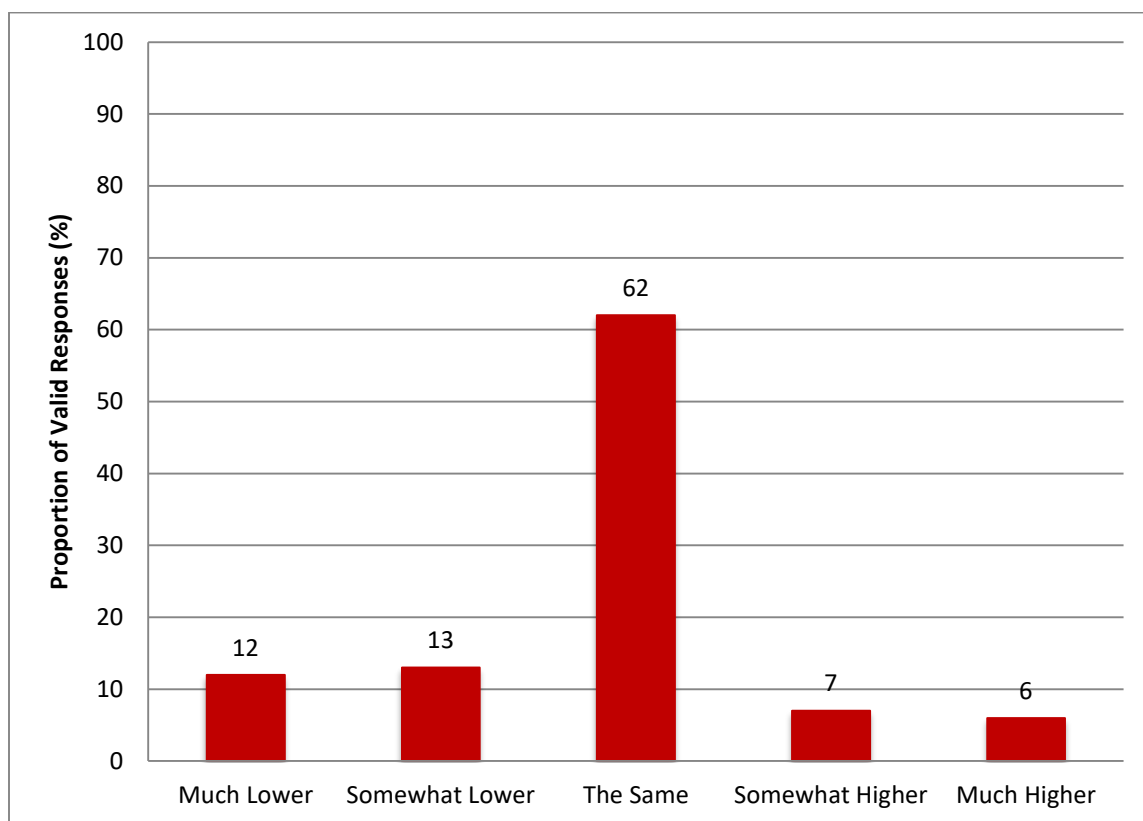
Figure 9 reveals that more than two-thirds (74%) of Harris County residents who lost electrical power considered this loss to be extremely or very serious along with 71% of those who lost access to running water in their home. More than half who lost access to drinkable water (64%) in their home, lost internet service (53%), suffered water damage to their residence (53%), and lost cell phone service (53%) also considered this lost service experience to be either extremely serious or very serious. With one exception, only 27% of those who suffered an injury or illness within their immediate family considered it to be extremely or very serious, all of the other negative effects were considered by between 42% and 49% of those Harris County residents afflicted to be either extremely serious or very serious.

During the winter storm there were many reports of the health of Texans who depend on medical equipment powered by electricity in their home or outside it (such as at a dialysis center) being put at risk. The respondents were asked if the electrical power

outages adversely affected a family member whose health depends on medical equipment powered by electricity. Overall, 16% of Harris County residents reported that an immediate family member's health was adversely affected by the power outages.

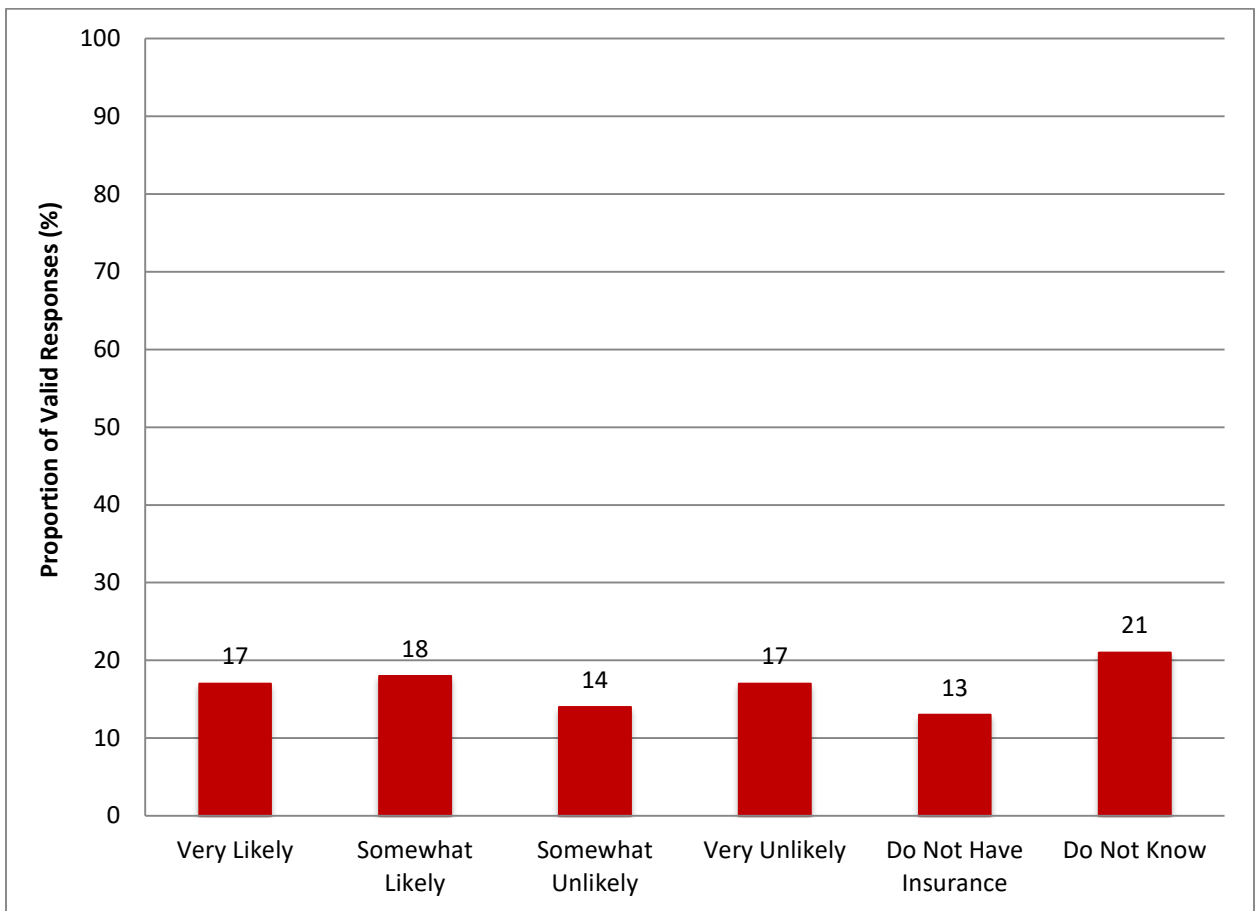
The winter storm and the need for people to seek shelter and warmth in often crowded conditions also raised fears that many Harris County residents were not as observant of social distancing during the week of February 14-20 as they had been in prior weeks. Figure 10 suggests these fears were generally overstated, with the social distancing of 62% of Harris unchanged, and 13% reporting higher than normal observance of social distancing that week (6% much higher and 7% somewhat higher). In all, only one in four Harris County residents (25%) reported that their level of social distancing observance during the week of the winter storm was lower than normal, with 12% reporting it being much lower and 13% reporting it being somewhat lower.

Figure 10. Level of Observance of Social Distancing in Harris County the Week of February 14-20 Compared to the Previous Week of February 7-13



In Figure 8 (and Table 2) 38% of Harris County reported that they suffered water damage from the storm. These individuals were then asked a follow-up question regarding the likelihood that insurance will cover the full amount of the damages. The responses to this query are detailed in Figure 11. One-third (35%) believed that it was either very likely (17%) or somewhat likely (18%) that insurance would cover the cost of all of the damages, while 31% considered it unlikely (14% somewhat unlikely and 17% very unlikely). A little more than one in seven Harris County residents (13%) reported that they did not have insurance, and another 21% responded that they did not know if insurance would cover the full amount of their damages.

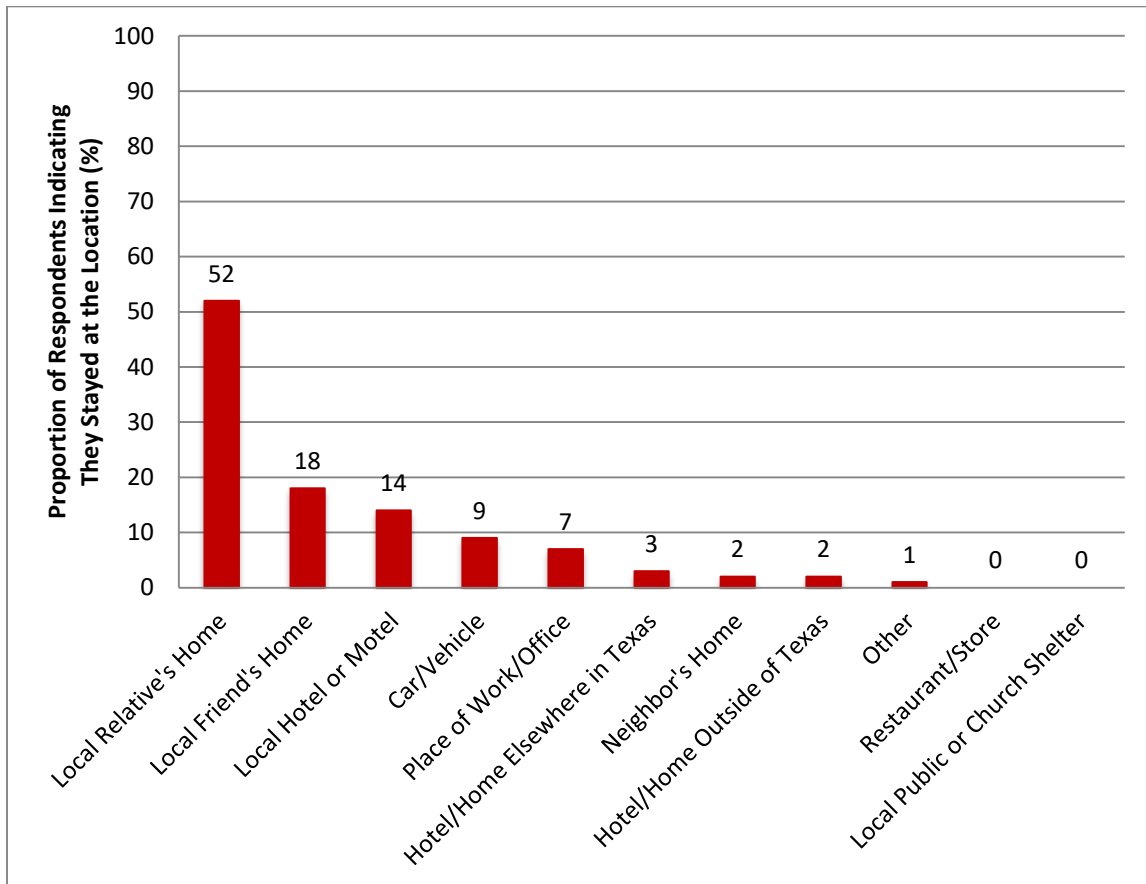
Figure 11. Among Harris County Residents Who Suffered Damages from the Storm, How Likely is it that Insurance Will Cover the Full Amount of the Damages?



Coping with the Loss of Heat

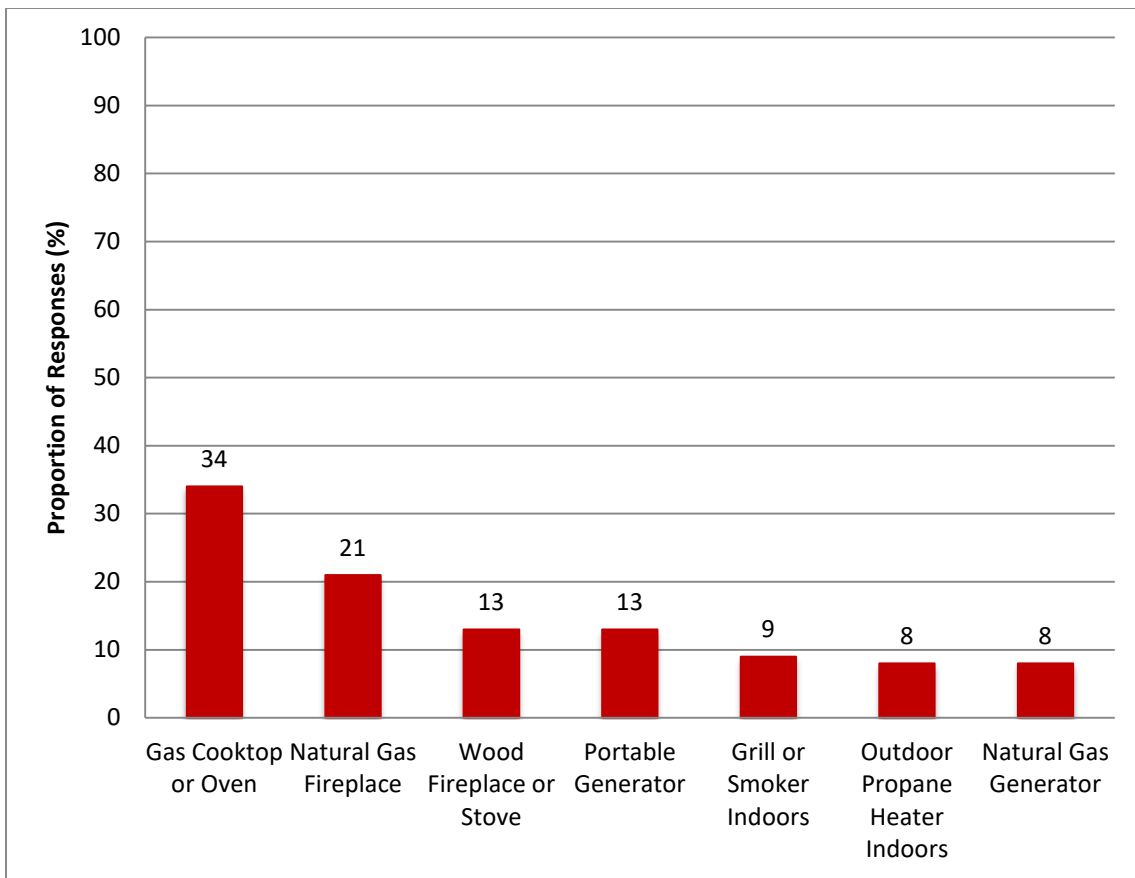
When the power went off in their home and temperatures began to drop to near or below freezing indoors, one in four (26%) Harris County residents opted to leave their home. Of these individuals, Figure 12 reveals that the largest proportion (52%) went to the home of a local relative, with the next largest proportions going to a local friend's home (18%) or to a local hotel or motel (14%). The remaining destinations were all in the single digits, ranging from their vehicle (9%) or place of work (7%), to a restaurant or store (0%) or a local public or church shelter (0%), with a hotel/home elsewhere in Texas (3%), a neighbor's home (2%), and a hotel/home outside of Texas (2%) in between.

Figure 12. Where the 1/4 of Harris County Residents Who Lost Power and Left Home Stayed During the Winter Storm



For the majority of Harris County residents who remained in their home, Figure 13 reveals the main strategies they used to try to stay warm during the electrical power outage. More than one-third (34%) used their natural gas oven or cooktop as a source of heat, with slightly less than one in five using a natural gas fireplace (21%) with the same goal. Approximately one in ten Harris County residents used a wood fireplace or stove (13%), a gasoline or diesel portable generator (13%), or a natural gas generator (8%) to stay warm. Finally, in spite of the risk of carbon monoxide poisoning, desperate to stay warm, 9% of Harris County residents used a grill or smoker indoors while 8% used an outdoor propane heater indoors. That is one in seven (14%) Harris County residents felt compelled to put their lives at risk to keep from freezing (3% used both a smoker/grill and an outdoor propane heater indoors).

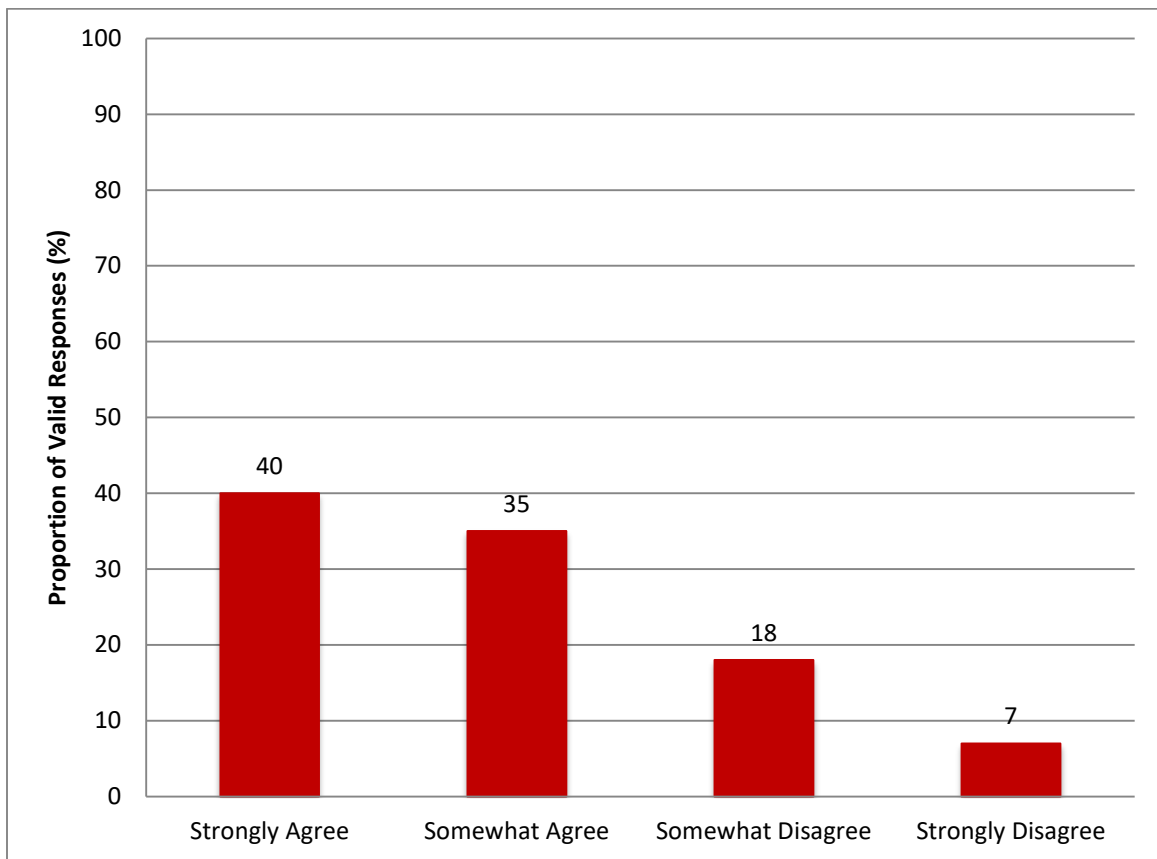
Figure 13. Most Common Sources of Heat While Electricity Was Off in Harris County



Government, Public Officials, Public Utilities and the Winter Storm

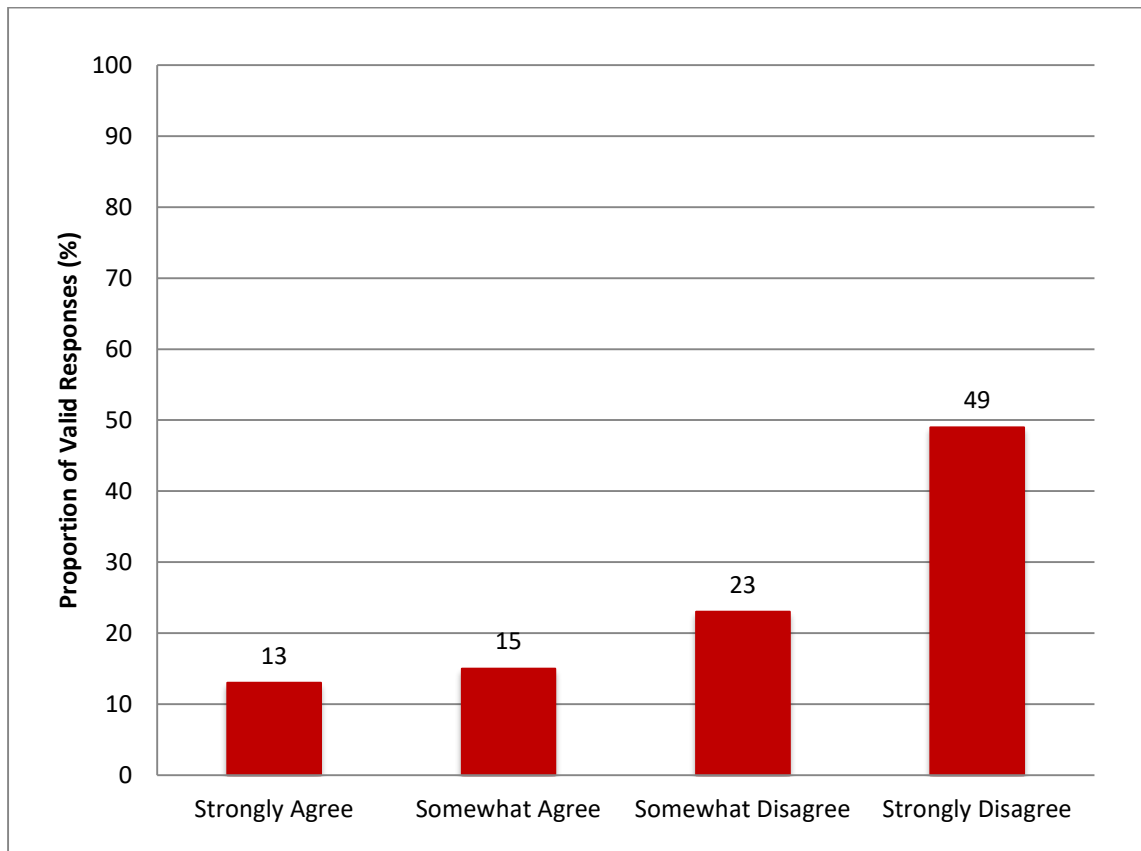
Harris County residents were asked the extent to which they agreed or disagreed with a statement that their ability to prepare for and respond to the winter storm would have benefited from more timely and accurate information before, during, and after the storm during the week of February 14-20. As Figure 14 underscores, an overwhelming majority (75%) agreed that they would have benefited from more timely and accurate information (40% strongly and 35% somewhat), compared to only 25% who disagreed (7% strongly and 18% somewhat).

Figure 14. Ability of Harris County Residents to Prepare for and Respond to the Winter Storm Would Have Benefited from More Timely and Accurate Information Before and After it Hit



Harris County residents also believe that the cuts in electrical power in their area were not carried out in an equitable manner. When respondents were queried on the extent to which they agreed or disagreed with a statement that the cuts in electrical power in their area were carried out in an equitable manner (see Figure 15), 72% disagreed (49% strongly and 23% somewhat), compared to only 28% who agreed (13% strongly and 15% somewhat).

Figure 15. Agreement/Disagreement That the Cuts in Electrical Power in Harris County Were Carried Out in an Equitable Manner



The respondents also were asked to evaluate the job performance (including communication with the public) of a set of 11 elected officials, governments, and entities during the winter storm that took place between February 14-20. Respondents were given the options of strongly approve, somewhat approve, neither approve nor disapprove, somewhat disapprove, strongly disapprove, or don't know. Table 3 on page 23 provides the results. The proportion of Harris County residents who approve of the performance of the individuals, government, or entities range from highs of 49% (President Joe Biden) and 48% (Harris County Judge Lina Hidalgo), to lows of 12% (the Public Utility Commission [PUC] of Texas) and 9% (ERCOT, the Electric Reliability Council of Texas).

Table 3: Evaluating the Job Performance of Elected Officials and Governments During the Winter Storm

Elected Official/ Government	Percentage Distribution (%)					
	Strongly Approve	Somewhat Approve	Neither Approve nor Disapprove	Somewhat Disapprove	Strongly Disapprove	Don't Know
Governor Greg Abbott	12	9	17	9	47	6
Texas State Government	8	12	18	12	43	7
County Judge Lina Hidalgo	35	13	19	6	18	9
Harris County Government	15	21	25	10	17	13
Your Mayor	27	19	19	6	19	10
Your Municipal Government	12	19	29	5	20	15
Your Local Electric Utility	10	11	16	17	36	10
ERCOT	2	7	7	7	71	6
Public Utility Commission of Texas	6	6	13	11	47	17
President Joe Biden	36	13	20	5	19	7
Federal Government	15	20	25	11	17	12

For the three elected officials mentioned in the survey by name, Harris County Judge Lina Hidalgo, Texas Governor Greg Abbott and President Joe Biden, there existed sharp partisan differences in regard to their approval ratings.

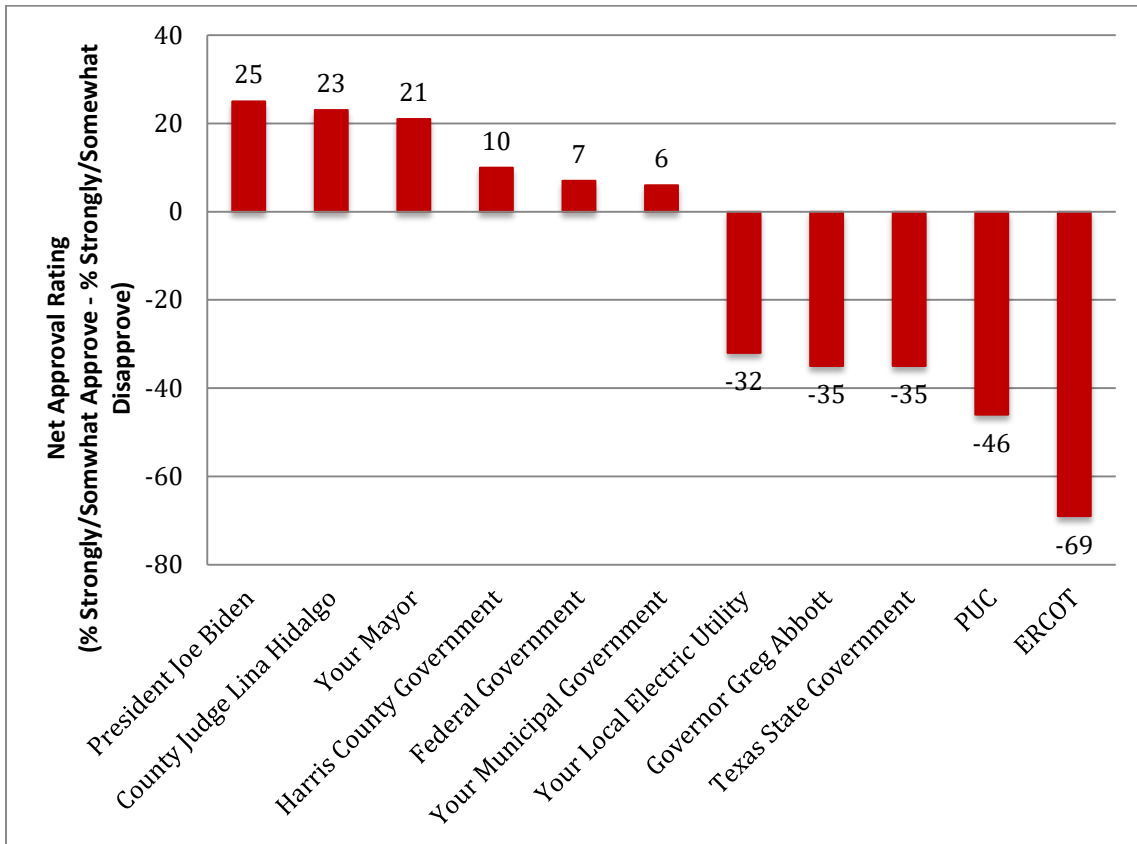
More than one-half (52%) of Republicans approved (31% strongly and 21% somewhat) of Abbott’s performance during the winter storm compared to one-quarter (25%) who disapproved (21% strongly and 4% somewhat). In sharp contrast, only one in ten (11%) Democrats approved (8% strongly and 3% somewhat) of Abbott’s performance while 73% disapproved (61% strongly and 12% somewhat).

More than two-thirds (70%) of Democrats approved (51% strongly and 19% somewhat) of Hidalgo's performance during the winter storm compared to one-tenth (10%) who disapproved (5% strongly and 5% somewhat). Almost one in four (23%) Republicans approved (9% strongly and 14% somewhat) of Hidalgo's performance while 55% disapproved (46% strongly and 9% somewhat).

More than four-fifths (81%) of Democrats approved (65% strongly and 16% somewhat) of Biden's performance during the winter storm, compared to less than one in twenty (3%) who disapproved (0% strongly and 3% somewhat). Fewer than one in twenty (19%) Republicans approved (15% strongly and 4% somewhat) of Biden's performance while 60% disapproved (54% strongly and 6% somewhat).

Figure 16 on page 25 provides the net approval rating (the percentage who strongly approve or somewhat approve minus the percentage who strongly disapprove or somewhat disapprove) for each of the 11 elected officials, governments, and entities. Slightly more than one-half (6) of the 11 have a positive net approval rating. The three officials/entities with the highest net approval ratings of their performance during the 2021 winter storm are President Joe Biden (+25%), Harris County Judge Lina Hidalgo (+23%), and the respondent's mayor (21%), which, for the majority of these Harris County residents, is City of Houston Mayor Sylvester Turner, both for those who formally live within the boundaries or extraterritorial jurisdiction (ETJ) of the City of Houston or live elsewhere in Harris County (in the unincorporated portion of one of the 33 smaller municipalities) but nevertheless still consider Turner "their mayor". These three individuals are followed in net approval ratings by the governments they administer: Harris County government (+10%), the federal government (+7%), and the respondent's municipal government (+6%).

Figure 16. Harris County Net Approval Ratings of the Performance of Elected Officials and Governments During the Winter Storm



The two entities with the lowest net approval ratings of their performance during the winter storm among Harris County residents are ERCOT (-69%) and the Public Utility Commission (PUC) of Texas (-46%). The remaining two entities and one individual have comparable negative net approval ratings: Texas state government (-35%), Governor Greg Abbott (-35%), and the respondent's local electric utility (e.g., CenterPoint) (-32%).

Harris County residents also were asked what type of impact the winter storm would have on their 2022 vote decision. The options were that it would have no impact since they would not be voting in 2022, that it would not be a factor in their vote decision, that it would be one of many factors in their vote decision, and it would be a very important factor in their vote decision.

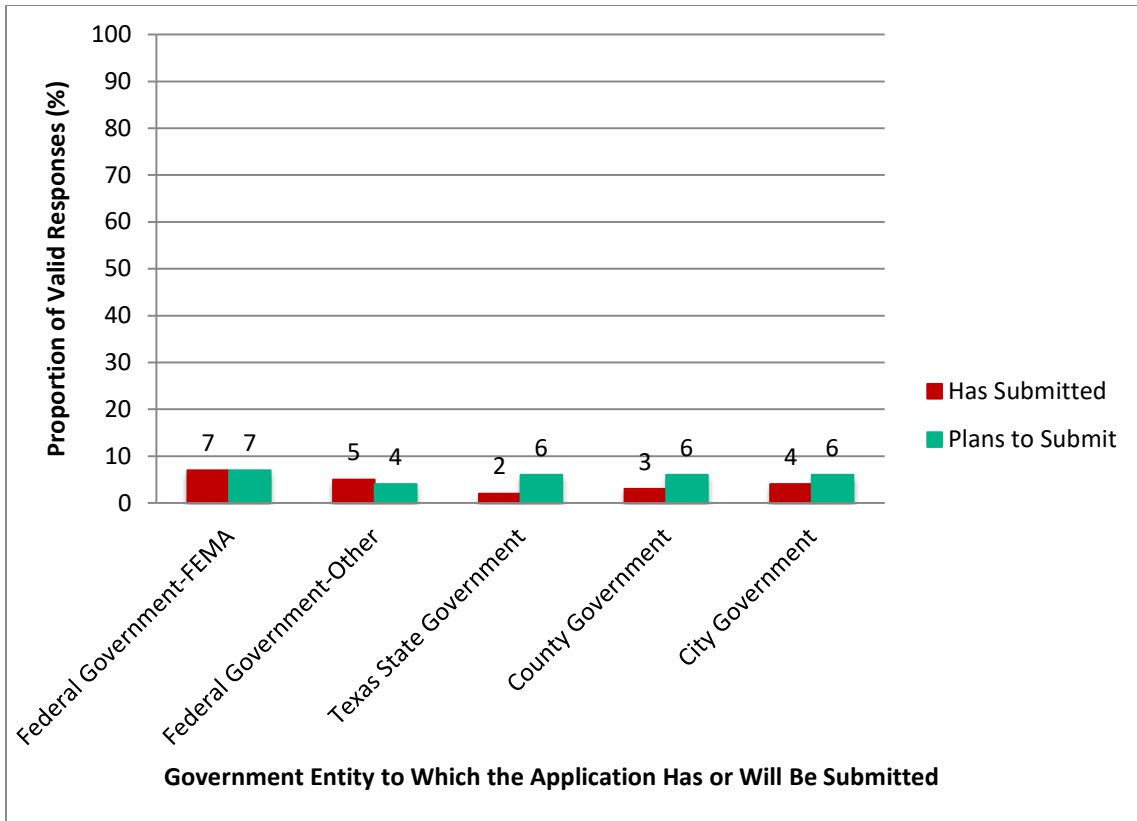
Table 4 highlights the relatively equal distribution of the Harris County residents who may vote in 2022, with 33% saying the winter storm would be a very important factor in their vote decision, 27% reporting it would be one of many factors, and 26% indicating that it would not be a factor in their vote decision. Slightly more than one-half (51%) of Republicans report that the winter storm will not be in factor in their 2022 vote decision compared to less than one-in-five (17%) of Democrats. Conversely one-half (50%) of Democrats report the winter storm will be a very important factor in their 2022 vote decision compared to less than one-in-five (16%) Republicans. Independents are pretty evenly split across the categories, with slightly more (27%) indicating the storm will not be a factor in their 2022 vote decision than indicating it will be a very important factor (24%).

Table 4. Impact of Winter Storm on 2022 Vote Decision?

Impact	Percentage Distribution of Valid Responses (%)			
	All Texans	Democrats	Independents	Republicans
Very Important Factor	33	50	24	16
One of Many Factors	27	25	27	29
Not a Factor	26	17	27	51
Will Not Vote	14	8	22	4

Finally, Figure 17 reveals that to date, a relatively small proportion of Harris County residents (though greater than other Texans) have either submitted or are planning on submitting an application for aid to a range of federal, state, and local government entities. The highest proportion who have already submitted an application is found for those who have submitted to the Federal Emergency Management Agency (FEMA), to which 7% of Harris County residents have submitted an application for aid, with the other entities registering proportions of Harris County residents who have already submitted an application of between 2% and 5%. Slightly larger proportions of Harris County residents plan to submit an application for aid to one or more of these government entities in the future, ranging from a low of 4% who plan to submit the application to a federal government entity other than FEMA to a high of 7% who plan to submit an application for aid to FEMA.

Figure 17. Proportion of Texans Who Have Submitted or Are Planning to Admit Applications for Aid to Different Government Entities



Support for & Opposition to Potential Policy Reforms After the Winter Storm

Respondents were presented with 16 randomly rotated policies that have been proposed in Texas to safeguard the state from the effects of severe weather on its energy supply and delivery and asked to what extent they support or oppose each of the policies, with the specific response options being: strongly support, somewhat support, neither support nor oppose, somewhat oppose, strongly oppose, and don't know. Table 5 on page 30 provides a summary of the support for and opposition to these 16 policies, and Table 6 on page 32 summarizes the level of combined support (strongly support plus somewhat support) for these 16 policies both overall and by partisanship. Two-thirds or more of Harris County residents support the following seven policies:

- Require electricity generators (EG) to fully weatherize/winterize their plants to participate in the Texas market: 73% support (53% strongly and 20% somewhat),
- Require the Public Utility Commission (PUC) of Texas to review, inspect and approve all weatherization/winterization efforts by electricity generation companies: 73% support (52% strongly and 21% somewhat),
- Require natural gas (NG) pipeline companies to fully weatherize/winterize their infrastructure to participate in the Texas market: 72% support (51% strongly and 21% somewhat),
- Increase the cap on penalties on utility companies for market manipulation and reliability failures from the current \$25,000 per day to \$100,000 per day: 71% support (54% strongly and 17% somewhat),
- Upgrade Texas building codes to require new construction to be more climate resilient: 69% support (45% strongly and 24% somewhat),
- Require electricity generators (EG) to maintain a more substantial minimum electricity reserve capacity to participate in the Texas market: 68% support (46% strongly and 22% somewhat),
- Adopt a Texas solar bill of rights to insure consumers are provided full information by solar installation companies and to prevent cities from placing restrictions on the installation of solar energy devices that are more restrictive than a homeowner's HOA: 66% support (40% strongly and 26% somewhat).

Furthermore, all seven of these policies enjoy robust bipartisan support. Three-fourths or more of Texas Democrats support all of these policies. And, more than three out of every four Republicans support all but two of these policies, and those exceptions, upgrading Texas building codes to require new construction to be more climate resilient

and adopting a solar bill of rights, are still supported by 60% and 58% of Republicans, respectively.

Five policies do not enjoy the support of an absolute majority of Harris County residents:

- Tax the flaring of methane gas from Texas oil & natural gas wells and end all flaring by 2025 via economic incentives and regulations: 48% support (32% strongly and 16% somewhat),
- Allow ERCOT to enter into more contracts with industrial and large commercial clients, providing them lower electricity rates in exchange for their agreement to shut down or reduce their electricity use when electricity demand is expected to approach or exceed supply: 36% support (15% strongly and 21% somewhat),
- Allow natural gas (NG) pipeline companies to charge industrial clients and consumers an additional fee to fully weatherize/winterize their infrastructure: 32% support (13% strongly and 19% somewhat),
- Allow electricity generators (EG) to charge consumers an additional fee to support the maintenance of a more substantial minimum electricity reserve capacity by generators: 25% support (10% strongly and 15% somewhat),
- Allow electricity generators (EG) to charge consumers an additional fee to pay for weatherization/winterization: 21% support (11% strongly and 10% somewhat).

Democrats, Independents, and Republicans are all in agreement in their lack of support for policy reforms that would allow electricity generators and pipeline companies to charge consumers an additional fee to pay for either weatherization or the maintenance of reserve capacity. They also are all in sync in their tepid level of support for allowing ERCOT to enter into more load reduction contracts.

In contrast, Democrats (62%) are significantly more likely than Independents (40%) and Republicans (37%) to support the taxing of the flaring of methane gas and ending all flaring by 2025.

Table 5. Support for and Opposition to Potential Policy Reforms After the Storm

Policy Reform	Percentage Distribution of Valid Responses (%)				
	Strongly Support	Somewhat Support	Neither Support nor Oppose	Somewhat Oppose	Strongly Oppose
\$25k to \$100k Increase of Daily Utility Penalty Cap	54	17	23	3	3
Require EG to Fully Weatherize	53	20	18	6	3
PUC Oversight of EG Weatherization Efforts	52	21	20	5	2
Require NG Pipelines To Fully Weatherize	51	21	21	6	1
Require EG to Maintain Reserve Capacity	46	22	26	3	3
Upgrade Building Codes-More Climate Resistant	45	24	17	7	7
Merge TX Grid With National Grid(s)	41	14	24	6	15
Solar Bill of Rights	40	26	24	2	8
State Subsidies For Low Income Weatherization	38	19	30	4	9
Suspend NG Shipments in Severe Weather	32	25	31	7	5
End All Flaring by 2025 via Taxes/Regulations/Incentives	32	16	35	5	12
EG Windfall Profits Tax when Price Abnormally High	32	22	31	5	10
Allow ERCOT More Load Reduction Contracts	15	21	32	12	20
Consumer Fee for NG Pipeline Weatherization	13	19	30	11	27
Consumer Fee for EG Weatherization	11	10	22	19	38
Consumer Fee for EG Reserve Capacity	10	15	22	16	37

Finally, there exists majority, but not overwhelming majority, support for four policies:

- Have the state provide subsidies to assist low income Texans with home weatherization to increase energy efficiency: 57% support (38% strongly and 19% somewhat),
- Require the Texas governor to suspend out of state shipments of Texas natural gas (NG) when weather like that February 14-20 is forecast: 57% support (32% strongly and 25% somewhat),
- Merge the currently separate Texas electrical grid with one of the two national grids (the Eastern or the Western): 55% support (41% strongly and 14% somewhat)
- Adopt a windfall profits tax for electricity generators on any profit when the megawatt hour (MWh) price rises above the high end of the grid's normal range of \$50 per MWh, and use this tax revenue to support energy resiliency efforts: 54% support (32% strongly and 22% somewhat).

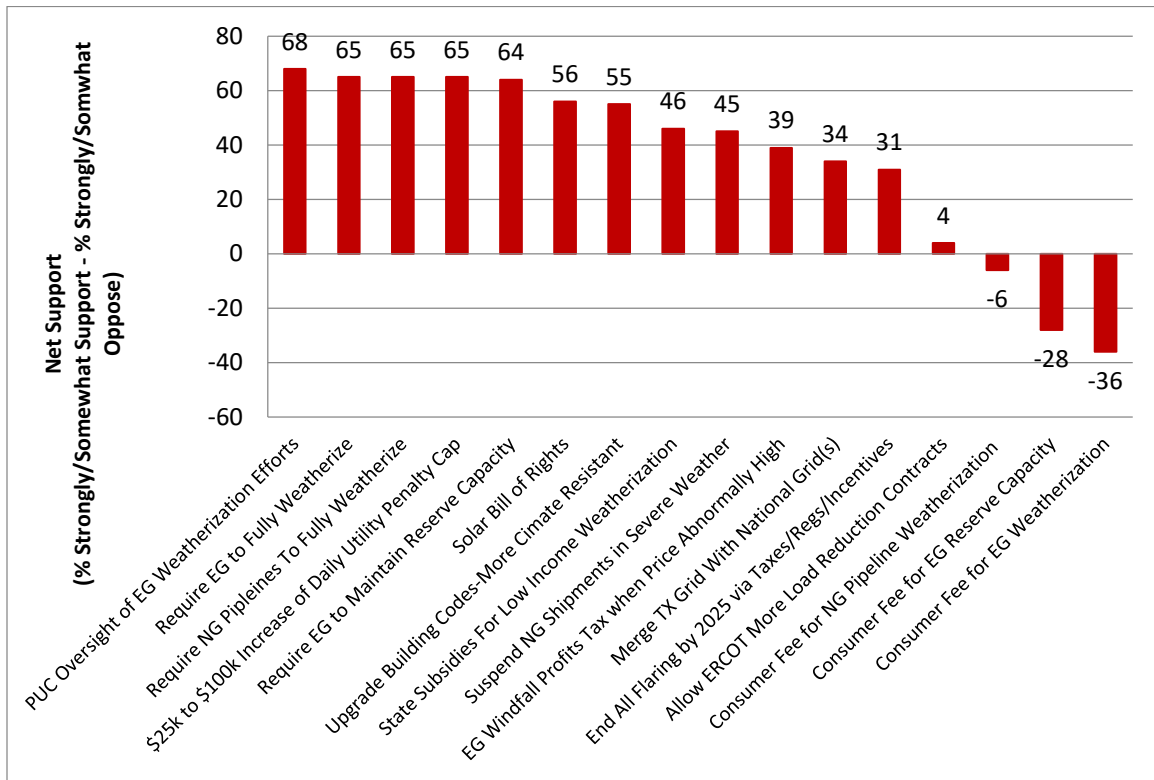
Democrats (72%) are significantly more likely than either Independents (42%) or Republicans (45%) to support the policy of merging the currently separate Texas electrical grid with one or both of the two national grids. And almost two-thirds of Democrats (66%) and Republicans (66%) support a policy that would require the Texas governor to suspend out of state shipments of Texas natural gas in the event of severe weather, compared to only 42% of independents. In a similar vein, three-fifths or more of both Republicans (63%) and Democrats (60%) support the adoption of a windfall profits tax on electricity generators, compared to only 44% of Independents.

Table 6. Partisanship and Support for and Opposition to Potential Policy Reforms After the Storm

Policy Reform	Percentage Distribution of Valid Responses (%)			
	All HC Support	Democrat Support	Independent Support	Republican Support
Require EG to Fully Weatherize	73	80	67	77
PUC Oversight of EG Weatherization Efforts	73	77	65	86
Require NG Pipelines To Fully Weatherize	72	75	64	85
\$25k to \$100k Increase of Daily Utility Penalty Cap	71	75	67	76
Upgrade Building Codes-More Climate Resistant	69	75	74	60
Require EG to Maintain Reserve Capacity	68	76	56	77
Solar Bill of Rights	66	79	55	58
State Subsidies For Low Income Weatherization	57	73	55	45
Suspend NG Shipments in Severe Weather	57	66	42	66
Merge TX Grid With National Grid(s)	55	72	42	45
EG Windfall Profits Tax when Price Abnormally High	54	60	44	63
End All Flaring by 2025 via Taxes/Regulations/Incentives	48	62	40	37
Allow ERCOT More Load Reduction Contracts	36	42	29	44
Consumer Fee for NG Pipeline Weatherization	32	31	27	38
Consumer Fee for EG Reserve Capacity	25	27	22	26
Consumer Fee for EG Weatherization	21	22	14	29

Figure 18 summarizes the information contained in Table 5 via a metric that represents the net support among Harris County residents for the 16 policy proposals, with net support calculated by summing the proportion of respondents who strongly support and somewhat support the policy, and then subtracting from this value the sum of the proportion of Harris County residents who strongly oppose and somewhat oppose the policy.

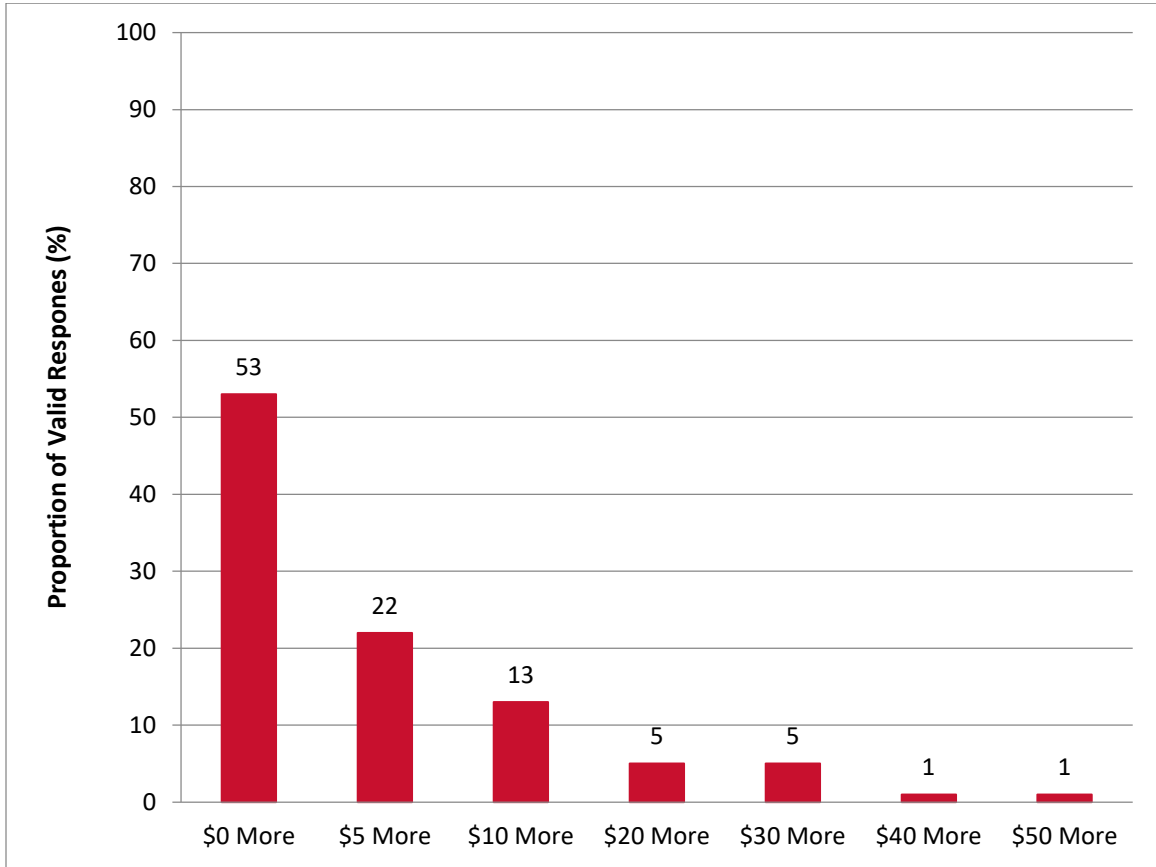
Figure 18. Net Support in Harris County for Potential Post-Winter Storm Policy Reforms



Thirteen of the 16 policies enjoy positive net support scores, while three of the policies possess negative net support scores. The five policies that stand out as having the highest net support scores are those which would require the Public Utility Commission (PUC) of Texas to review, approve and inspect all winterization efforts by electricity generation companies (+68%), require electrical generators (EG) to fully weatherize/winterize to participate in the Texas market (+65%), require natural gas (NG) companies to fully weatherize/winterize in order to participate in the Texas market (65%), increase the daily penalty cap on utility companies from \$25,000 to \$100,000 (65%), and require electrical generators (EG) to maintain a more substantial reserve capacity to participate in the Texas market (+64%).

The three policies with negative net support ratings all would impose a fee on consumers in order to pay for the weatherization of their facilities by electricity generators (-36%) and natural gas companies (-6%) as well as allow electricity generators to maintain a more substantial minimum reserve capacity (-28%).

Figure 19. Additional Amount Harris County Residents Willing to Pay on Monthly Electricity Bill to Safeguard Texas Electrical Grid from Severe Weather



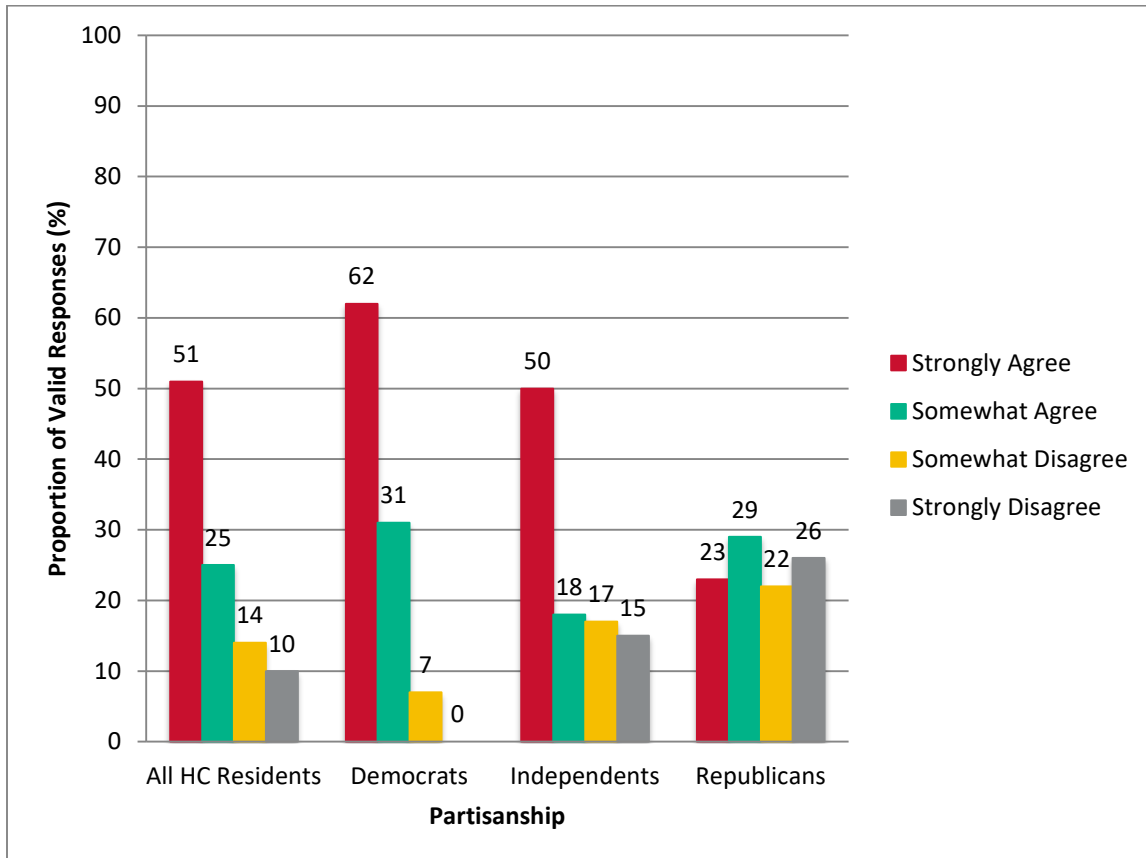
As Figure 18 makes clear, there is not a great deal of support among Harris County consumers for fees to support efforts such as winterization and the development of greater reserve generation capacity with the goal of preventing the repeat of the 2021 debacle. That said, the survey did ask respondents what additional amount they would be willing to pay on their monthly electricity bill to safeguard the Texas electrical grid from severe weather such as that experienced during the week of February 14-20. A bare absolute majority (53%) indicated (see Figure 19) they would not be willing to pay any additional fee to support these efforts. The next most common option was \$5 more, which one-fifth (22%) said they would be willing to pay each month. These amounts were followed by 13% who would be willing to pay \$10 more monthly, with the

remaining 12% of Harris County residents spread among those who would be willing to pay \$20 more (5%), \$30 more (5%), \$40 more (1%), and \$50 more (1%) every month.

Climate Change and Severe Weather

The survey respondents were asked the extent to which they agreed or disagreed) with this statement: “Due to climate change, Texas is today more likely to be adversely affected by severe weather than was the case thirty years ago.” Figure 20 reveals that more than three-fourths (76%) of Harris County residents either strongly agree (51%) or somewhat agree (25%) that due to climate change, Texas is more likely to be adversely affected by severe weather today than was the case 30 years ago. In sharp contrast, less than one-fourth (24%) of Harris County residents either strongly disagree (14%) or somewhat disagree (10%) with this statement. Virtually all Democrats (93%) agree with the statement (62% strongly), along with two-thirds (68%) of Independents (50% strongly). In contrast, only a bare majority of 52% of Republicans agrees with this statement (23% strongly), while 48% disagree (26% strongly).

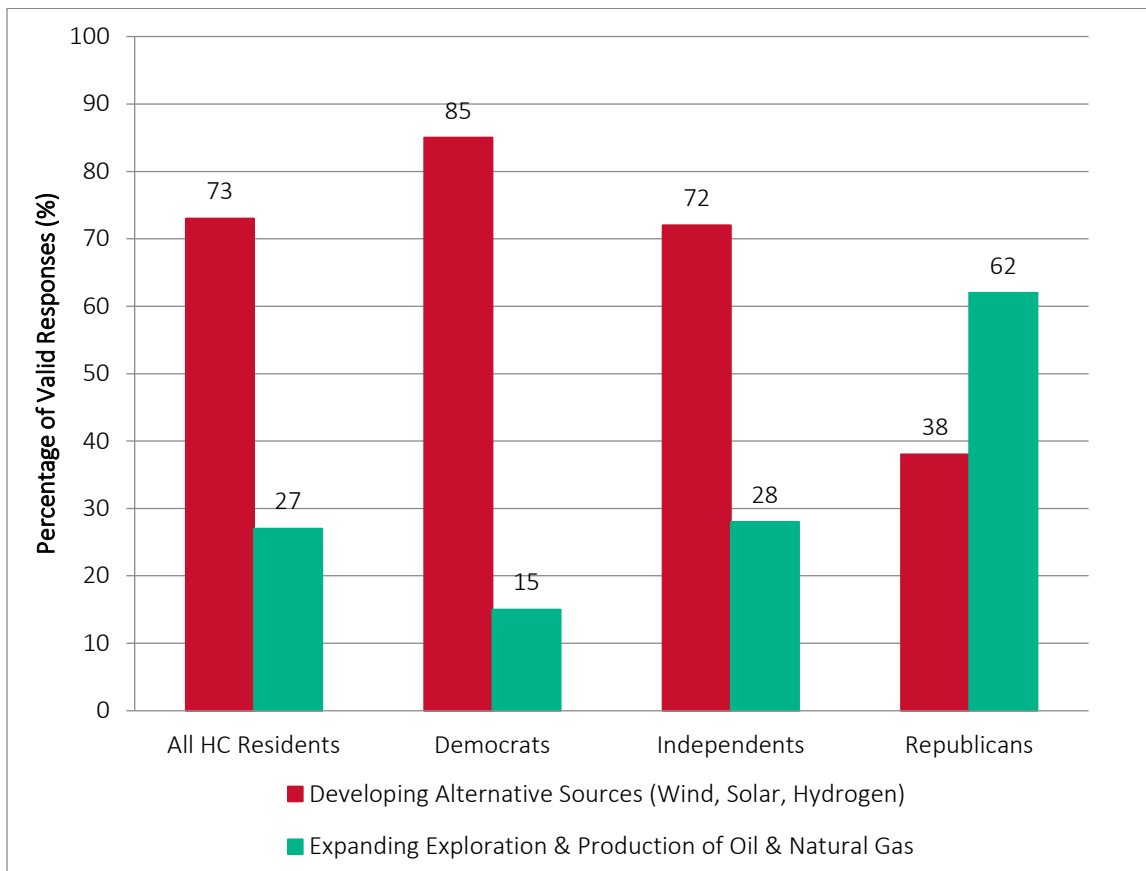
Figure 20. Agree/Disagree that Due to Climate Change Texas is More Likely to be Adversely Affected by Severe Weather than 30 Years Ago



Sources of Energy for America

The survey respondents were asked, “Right now, which one of the following do you think should be the more important priority for addressing America’s energy supply?” The three response options were developing alternative sources such as wind, solar and hydrogen, expanding exploration and production of oil and natural gas, and don’t know. Figure 21 indicates that 73% of Harris County residents with an opinion believed it was more important to develop alternative sources such as wind, solar and hydrogen, while 27% believed it was more important to expand the exploration and production of oil and natural gas.

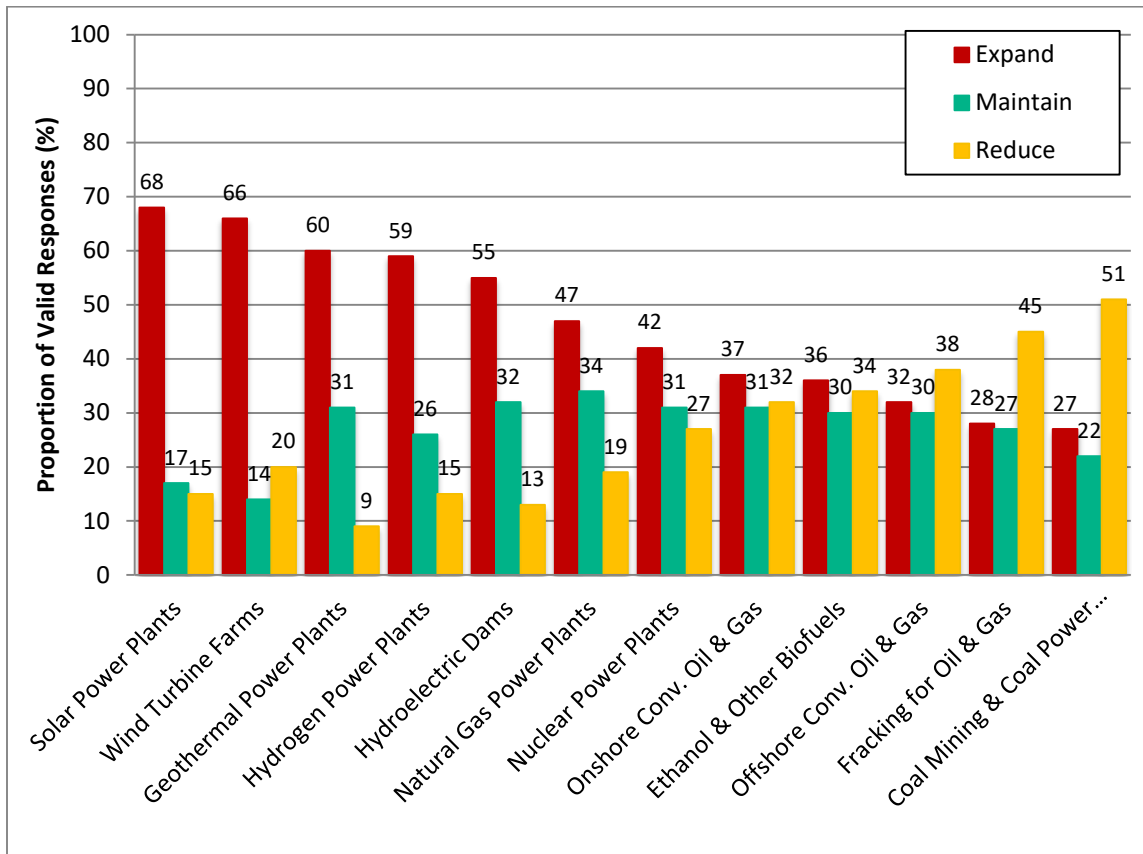
Figure 21. Partisanship & Most Important Priority for Addressing America's Energy Supply Today (% valid responses)



In other words, almost three out of four of the residents of the (fossil fuel) energy capital of the world favor developing alternative sources of energy over expanding oil and natural gas production, at a level that is significantly higher than that of other Texans, 56% of whom favor developing alternative sources of energy compared to 44% who favor expanding oil and natural gas production. More than four-fifths (85%) of Democrats prioritize developing alternative sources of energy, such as wind and solar, compared to more than two-thirds (72%) of Independents, and slightly less than two-fifths (38%) of Republicans. In contrast, only a little less than one in six Democrats (15%) and one in three Independents (28%) favor prioritizing the expansion of exploration and production of oil and natural gas, compared to more than three-fifths (62%) of Republicans.

Finally, the respondents were queried about whether they favor expanding, reducing or maintaining at the present level 12 different sources of energy in the United States. Figure 22 provides the distribution of support for expanding, maintaining, and reducing the 12 different sources of energy in the United States.

Figure 22. Support in Harris County for Expanding, Reducing or Maintaining at the Present Level 12 Sources of Energy in the United States



More than half of Harris County residents favor expanding five sources of energy, all of which fall under the renewable or alternative rubric: solar power plants (68%), wind turbine farms (66%), geothermal power plants (60%), hydrogen power plants (59%), and hydroelectric dams (55%). In contrast, a plurality of Texans favor reducing U.S. reliance on three sources of energy: coal mining and coal power plants (51%), fracking for oil and natural gas (45%), and offshore conventional oil and natural gas drilling (38%). Even in the fossil fuel energy capital of the world, fracking has more detractors than advocates. Intermediate between these two extremes are sources such as natural gas power plants (47% favor expanding, 19% favor reducing), nuclear power plants (42% expanding, 27% reducing), onshore conventional oil and natural gas drilling (37% expanding, 32% reducing), and ethanol and other biofuels (36% expanding, 34% reducing).

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