Evaluation of EnergyWise Low-Income Energy Efficiency Program in Mississippi

Program Performance, Design, and Implications for Low-Income Efficiency Programs

Prepared for Sierra Club and Gulf Coast Community Foundation

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EXECUTIVE SUMMARY

The EnergyWise program is a grant-funded low-income energy efficiency program in Mississippi administered by the Gulf Coast Community Foundation (GCCF). EnergyWise has been operating since 2015 and has helped about 700 low-income households improve their building energy use and reduce annual energy bills. The program serves low-income households that are customers of Mississippi Power Company (MPC) in the South and Central Mississippi area. The funding for EnergyWise comes from a legal settlement between Sierra Club and MPC regarding the Kemper plant, whereby the utility agreed to contribute $15 million to GCCF for renewable energy and energy efficiency projects.

GCCF and the Sierra Club retained Synapse Energy Economics, Inc. (Synapse) to evaluate the performance of the EnergyWise program. GCCF and Sierra Club asked Synapse to find out how EnergyWise has benefited program participants, to what extent the participants saved energy, how the design of the EnergyWise could be improved. Sierra Club also inquired if any aspects of the EnergyWise could be incorporated into an existing MPC low-income program called SELECT.

We reviewed program designs and the role of different entities involved in the EnergyWise program. The program provides comprehensive, turn-key home energy improvement services to low-income customers with a household income level at or below 200 percent of the federal poverty level (FPI). The program also has other criteria to target disadvantaged households. Participants receive various types of energy efficiency measures, with a maximum project cost of $5,000 per household (recently increased to $7,500). GCCF selected and awarded project funding to nine local implementers and developed the scope of the program by developing a program policy manual. When selecting local implementers, GCCF considered various factors including (a) substantial experience in weatherization projects; (b) a good reputation within their communities; (c) an established intake process; and (d) the proximity of the entities to potential participants. GCCF has also retained an energy auditor named RiverView that conducts audits before and after energy renovation projects. GCCF and RiverView provide training sessions for the local implementers and contractors within each division in the South and Central region.

To assess the performance of the EnergyWise program, we first reviewed and assessed RiverView's reported project costs and savings. This review found that the local implementers spent 40 percent of their budget on HVAC upgrades. Insulation and air infiltration/sealing together accounted for another combined 52 percent of project spending. RiverView used its estimation methodology to estimate the impact of the measures taken in the program. The projected average savings vary from 12 percent to 26 percent by implementer, with the average of 17 percent across all implementers.

We then reviewed and assessed actual energy usage data for a random sample of 56 project participants before and after the EnergyWise program.[1] We normalized energy consumption data before and after the energy renovation projects for weather effects using heating and cooling degree days, in order to attempt to better isolate the impacts of the efficiency measures.

Our bill analysis of the sample participants found that the projects decreased average monthly energy bills by $9.46, or about $113 per year on average, using the latest electric rates. We also found that customer usage decreased by about 78 kWh per month or 935 kWh per year across the sample households on average. This decrease represents about 6.7 percent of the usage prior to EnergyWise projects (See ES 1). Energy use reductions were not uniform in our sample. Residents with higher consumption showed greater reductions, while homes with low consumption actually increased electric use.

ES 1. Summary of usage and bills before and after the program for the sample projects

	Avg. Per Month (Before)	Avg. Per Month (After)	Avg. Change Per Month	Avg. Change Per Year	Avg. Percent Change
Usage (kWh)	1156 kWh	1078 kWh	-78 kWh	-935 kWh	-6.7%
Bill (2021 Rates Applied to Usage)	$152.81	$143.35	$(9.46)	$(113.53)	-6.19%

Real-world electric use among our sample was higher than RiverView's modeling suggested. One possible explanation for the usage increase is the rebound effect where residents use more energy when they have more energy efficient appliances or equipment because it is now cheaper to use those efficient appliances or equipment. Alternatively, residents may be more comfortable using a certain piece of equipment more frequently because it is now functional. In fact, GCCF staff mentioned that many program participants with lower electricity usage did not have working air conditioning units before the EnergyWise retrofit projects. These consumption increases benefit program participants by improving the indoor environment and improving safety during summer heat. Several states recognize and attach monetary values for improving comfort, health, and safety conditions when evaluating the cost-effectiveness of energy efficiency programs. We also identified factors unrelated to rebound effects, such as continuing to use older air conditioning units, changes in occupancy, or even travel behavior. In our analysis, we did not account for these random variables, but only accounted for weather impacts on energy usage.

We conducted limited interviews with program participants and program implementers, including contractors, to identify how various aspects of the program are working for program participants and implementers. We also sought specific areas for improvement.

[1] This sample size indicates a 90 percent likelihood that the actual population average is within 10 percent of the values we found.

- While our survey found some program participants found their bills remained the same even after the energy retrofits, they noted improved safety and comfort. Other participants also noted other non-energy benefits such as improved ability to pay for food and other necessities, as well as reduced illness. One major issue some participants noted was the difficulty of using smart thermostats.
- The local implementers we interviewed were generally satisfied with the administrative aspect of the program and felt the program is being run effectively. They were unanimously motivated by their desire to help their communities. They are also grateful for the measures offered and dollar amounts awarded for energy efficiency improvements; although, they noted that additional funds could always help. Implementers noted some challenges in addressing participants' needs for general improvements to their homes, and explaining to participants how to use digital thermostats.
- The contractors we interviewed appreciate being directly involved in helping participants, as well as the additional business from the program. The contractors also noted the program targets the right energy improvement measures. Programmable thermostats were also an issue and were a common reason contractors would have to return to customer homes.

The report presents specific recommendations for EnergyWise based on our quantitative analysis, interviews, and overall program evaluation.

Lastly, we reviewed the features of the EnergyWise program and MPC's low-income program, called SELECT. We identified four specific areas from the EnergyWise program that could be incorporated into SELECT:

- Customer targeting: While the EnergyWise program uses various eligibility criteria to ensure that the program serves low-income customers, SELECT does not provide any information about how it targets low-income customers except that the income target for the participants is at or less than 200 percent of federal poverty level.
- Eligible measures: The EnergyWise program offers a wide range of measures (e.g., light bulbs, insulation, air sealing, HVAC replacements, water heaters and refrigerator repair or replacements). In contrast, SELECT's offerings are currently limited to attic insulation and LED bulbs.
- Repairs: The EnergyWise program currently provides up to $500 for incidental repairs, which are often necessary for the effective performance or preservation of weatherization materials. SELECT is not designed to make repairs or identify or provide recommendations on any observed health and safety issues in a customer's home.
- Budget: The EnergyWise program spends up to $5,000 per participant (recently increased to $7,500). In contrast, SELECT spends roughly $500 per participant on average. This clearly shows there are more savings opportunities that SELECT can tap into.

1. INTRODUCTION

The EnergyWise program—a grant-funded low-income energy efficiency program in Mississippi administered by the Gulf Coast Community Foundation —has been operating since 2015 and has helped about 700 low-income households improve their building energy use and reduce annual energy bills. The Gulf Coast Community Foundation (GCCF) and the Sierra Club retained Synapse Energy Economics, Inc. (Synapse) to evaluate the performance of the EnergyWise program. They asked Synapse to find out how EnergyWise has benefited program participants, to what extent the participants saved energy, how the design of the EnergyWise could be improved. Sierra Club also asked if any aspects of the EnergyWise could be incorporated into Mississippi Power Company's (MPC) existing low-income program called SELECT.

This evaluation specifically includes the following types of review and analysis:

- Section 2: Review of the EnergyWise program design and structure
- Section 3: Review and assessment of the performance of the EnergyWise program, which includes the following specific tasks:
    - Review and assessment of the reported project costs and savings by the program auditor
    - Review and assessment of actual energy usage data for a sample of project participants before and after the EnergyWise program
- Section 4: Review of non-energy benefits identified and used in other jurisdictions in program performance evaluation
- Section 5: Survey of program participants and stakeholders including program implementers, program auditor, and program contractors
- Section 6: Review and comparison of the EnergyWise program and MPC's SELECT program

Finally in Section 7, we will summarize our key findings from the previous tasks and offer recommendations for improving both the EnergyWise program and MPC's SELECT program.

2. OVERVIEW OF ENERGYWISE PROGRAM

2.1. Overview

The EnergyWise program provides comprehensive, turn-key home energy improvement services to low-income customers living in MPC's service territory. Through this program, participants receive various types of energy efficiency measures, with a maximum of $5,000 per household (recently increased to $7,500). Eligible measures include, but are not limited to, efficient light bulbs, attic and floor insulation, air sealing, heating, ventilation, and air conditioning (HVAC) system tune-ups and replacements, water heaters, low-flow showerheads, and aerators. Eligible participants for this program are customers with a household income level at or below 200 percent of the federal poverty level. The program also prioritizes applicants who are:

- At or below 100 percent of the federal poverty level;
- Elderly (age 65 years and older);
- Disabled (receiving public or private disability payments);
- Have children in primary or secondary schools or younger; or
- In a home with a high energy burden.[2]

The EnergyWise program is administered by GCCF, which provides community services to citizens living in South and Central Mississippi. The funding for the program comes from a legal settlement between Sierra Club and MPC regarding the Kemper plant, whereby the utility agreed to contribute $15 million to GCCF for renewable energy and energy efficiency projects.[3] The total funding for the EnergyWise program is estimated to be approximately $7.5 million to serve a total of 1,200 low-income households throughout South and Central Mississippi, of whom about 700 have been served to date.[4]

[2] GCCF. 2015. *GCCF Residential Weatherization & Energy Efficiency Guidelines*, p. 8-10, attached as Appendix A to this report.

[3] GCCF. "Energy Efficiency & Renewable Energy Programs." Accessed May 20, 2021. Available at: https://www.mgccf.org/energy-efficiency-renewable-energy-programs/; Mississippi Power. "Renewable Energy." Available at: https://www.mississippipower.com/residential/ways-to-save/renewable-energy.html; Sierra Club, 2014. "Sierra Club Ends 6-Year Battle Over Kemper Plant, Sets Mississippi on Path to Clean Energy Economy." Available at: https://mississippi.sierraclub.org/content/sierra-club-ends-6-year-battle-over-kemper-plant-sets-mississippi-path-clean-energy-economy.

[4] Personal communication with Amy Perry, Program Director of GCCF.

2.2. Role of Key Entities

Sierra Club's legal settlement with MPC defined guidelines for the energy efficiency program and established a committee to advise GCCF regarding the expenditure of the funds.[5] The mission of the committee is to "[p]rovide the most effective possible energy efficiency services to low-income households in the Mississippi Power service area."[6] GCCF manages the funding for the EnergyWise program and administers the entire program. GCCF selected and awarded project funding to sub-grantees and developed the scope of the program by developing a program policy manual (provided to this report as Appendix A). The manual contains various details of program requirements and guidelines including administrative (e.g., reporting and financial) requirements, the project selection process and application of appropriate weatherization measures, and standards for quality of the work.

There are three other key program implementers under the EnergyWise program, as follows:

1. **Auditor**: RiverView Construction & Consulting Service (RiverView) conducts two energy audits for each project/household. The initial energy audit is used to guide which measures are installed in the household and the final audit serves to confirm the quality of the project work. At the start of the program, RiverView completed a Home Energy Rating System (HERS) rating but eliminated this after concluding that it was an inefficient use of time.
2. **Implementers**: The sub-grantees, or program implementers, are non-profit organizations selected by GCCF to manage contractors and run the program. In addition to having proven capabilities, each implementer selected was "currently providing similar weatherization and home energy savings service programs in MPC's service area."[7] Implementers were also required to work with the auditor to detail the scope of work at the participants' homes. A total of nine implementers managed or are currently managing projects in the program. The implementers include:
    - George-Greene Habitat for Humanity
    - Habitat for Humanity Bay-Waveland
    - Habitat for Humanity of the Mississippi Gulf Coast
    - Habitat for Humanity of the Pine Belt (formerly Hattiesburg Habitat for Humanity)
    - Lauderdale County Habitat for Humanity
    - Back Bay Mission
    - Hancock County Resource Center
    - Pine Belt Community Foundation/R3SM
    - Community Foundation of East Mississippi

[5] *Settlement Agreement concerning the Kemper Project and Daniel Control Projects*. Aug. 1, 2014. Appendix A. Available at https://mississippi.sierraclub.org/sites/mississippi.sierraclub.org/files/SierraClubAgreement-w-MississippiPower814.pdf

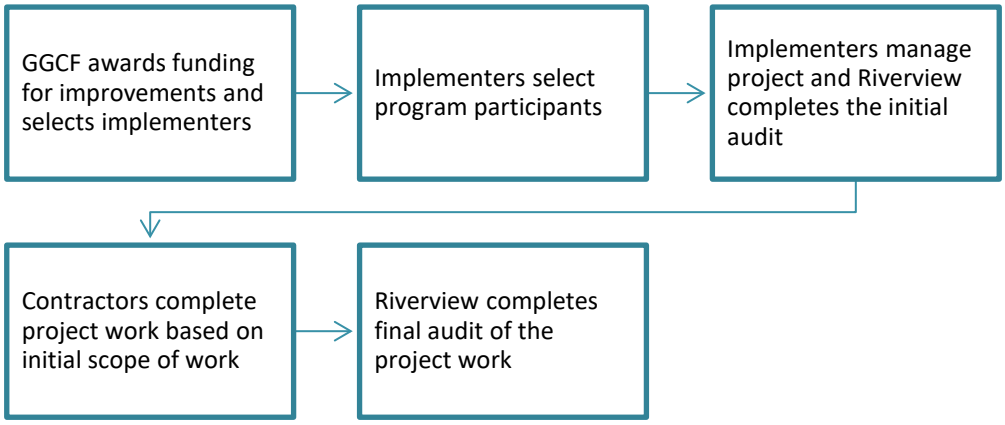
[6] Ibid.

[7] GCCF. 2015. *GCCF Residential Weatherization & Energy Efficiency Guidelines*.

3. **Contractors/Subcontractors**: Each implementer hires contractors to complete project work.

Figure 1 shows how and when each entity has been involved in the process.

Figure 1. Program process

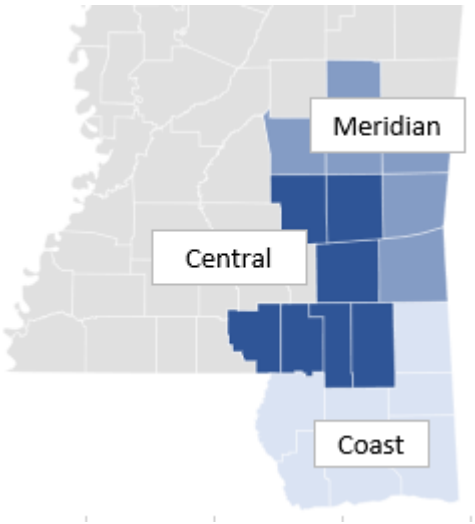


2.3. Selection of Local Implementers and Customer Targeting

GCCF spent a substantial amount of time assessing potential candidates for local implementers. It eventually selected nine local implementers to serve low-income customers evenly across three separate divisions: the Coast Division, Meridian Division, and Pine Belt Division in the South and Central Mississippi area (Figure 2).[8]

[8] Personal communication with Amy Perry, Program Director of GCCF.

Figure 2. EnergyWise Program service map



Source: Synapse Energy Economics, Inc.

GCCF received many inquiries and applications for the positions of local program implementers when the news about the establishment of the EnergyWise program was released to the public. Among the potential candidates, GCCF selected organizations that met the following criteria: (a) substantial experience in weatherization projects; (b) a good reputation within communities; and (c) an established intake process.[9]

Further, GCCF considered the proximity of the local implementers to potential program participants. GCCF set a target for the number of participants in each municipal district within each division, proportionally based on the number of residential electric customers.[10] However, this process did not consider the number of low-income customers in each division. The EnergyWise program has had approximately 700 participants to date and is still planning to reach 800 more customers over the next few years. Thus, we recommend that GCCF investigate income levels or energy burdens (spending on energy as a percent of income) in each municipal district within each division and consider making adjustments to the target numbers of potential participants by taking into account the population of low-income customers in each service area. One useful tool for this assessment is the U.S. Department of Energy's (DOE) Low-Income Affordability Data (LEAD) Tool.[11] LEAD provides energy burden estimates by county and census track.

Table 1 lists the names of local implementers in three separate divisions. Some of the local implementers such as George-Greene Habitat for Humanity, Habitat for Humanity Bay-Waveland, and

[9] Ibid.

[10] Ibid.

[11] U.S. DOE. "Low-Income Energy Affordability Data (LEAD) Tool." Accessed June 10, 2021. Available at: https://www.energy.gov/eere/slsc/maps/lead-tool.

Hancock County Resource Center have a wide service area and thus are serving multiple divisions through the program.

Table 1. Implementer by Division

Division	Implementer
Coast	Habitat for Humanity Bay-Waveland
	Habitat for Humanity of the Mississippi Gulf Coast
	George-Greene Habitat for Humanity
	Hancock County Resource Center
	Back Bay Mission
Meridian	Lauderdale County Habitat for Humanity
	George-Greene Habitat for Humanity
Pine Belt	George-Greene Habitat for Humanity
	Habitat for Humanity of the Pine Belt
	Pine Belt Community Foundation/R3SM

After hiring the local implementers, GCCF provided training sessions for them and for contractors within each division. The trainings were by provided by both GCCF and the program auditor. GCCF focused on discussions on the policy and program manual. The auditor provided both in-class and hands-on training on various topics including installations of HVAC, insulation, and air sealing.[12]

3. PERFORMANCE OF THE ENERGYWISE PROGRAM

3.1. Overview

We conducted an evaluation of the performance of the EnergyWise program by reviewing the following separate areas:

a) measure spending by implementer and end-use;

b) energy savings projected by the program auditor RiverView;

c) actual changes in energy usage after the projects; and

d) energy bills after the projects.

To conduct these analyses, we received detailed project data from GCCF for the majority of the program participants as well as energy usage data from both RiverView and MPC.

[12] Personal communication with Amy Perry, Program Director of GCCF.

3.2. Energy Auditor's Savings Estimate Methodology

RiverView initially projected energy savings using software called REM/Rate, a commonly used building energy simulation tool to calculate Home Energy Rating System (HERS) scores. However, this process became burdensome, so RiverView developed a spreadsheet model that calculated projected energy savings. This model used inputs and methods largely based on RiverView's past building model work using REM/Rate for Louisiana's Home Energy Rebate Option (HERO) program. The model was also adjusted for several local factors RiverView observed during the energy audits for the EnergyWise program.[13] For example, RiverView applied an energy usage adjustment factor to account for a situation where the participant kept their windows open with the air conditioning or heat on. The model also incorporated a derating factor which reflects the expected installation practices found from RiverView's final inspection of actual projects. In addition, the model incorporated usage impacts based on the age of participant homes, with projections based on age (pre 1950s, 1950s to 1970s, post 1970s). The contractor projected the greatest savings in the post 1970s homes.[14] Overall, RiverView's model projected target savings of 15 percent annually across the participating projects. The estimated average measure lives for the main improvements were 20 years for air sealing, 15 to 18 years for air conditioning, and 20 years for insulation.

We consider RiverView's spreadsheet model to be an acceptable approach to projecting energy savings. Because the use of REM/Rate requires an auditor to obtain and verify various types of information for each residential building (e.g., conditioned space, housing type, number of rooms, insulation type and level, window, air infiltration rate, efficiency level of equipment), the data gathering process takes more time and is more challenging for existing buildings than newly constructed buildings. When a HERS score needs to be determined by program rules and/or financial incentives are determined based on projected savings, the use of REM/Rate or other detailed building energy modeling tools is important to develop energy savings estimates. On the other hand, while savings estimates based on RiverView's modeling approach are less accurate, we consider that such an approach is acceptable for a low-income program like the EnergyWise program because this program does not require a HERS score and does not rely on savings estimates to determine incentive levels.

3.3. Program Implementation

We reviewed actual spending and projected savings from projects from all six implementers in our analysis. In order to restrict our evaluation to the EnergyWise program itself, we did not analyze implementers who had installed measures beyond those supported by the EnergyWise program.

[13] *E.g.,* Louisiana Department of Natural Resources. n.d. "Program Guidelines." Available at: http://www.dnr.louisiana.gov/assets/TAD/programs/residential/hero/EmPower_LA_Exist_Home_Program_Guidelines.pdf.

[14] Multiple personal communications with Wayne Erdman from March to May 2021.

The main investment for each project was determined by RiverView in its initial audit, based on its assessment of what the house needed. Figure 3 shows that the breakdown of budgets differed by implementer.

On average, implementers spent 40 percent of their budget on HVAC upgrades. Insulation and air infiltration/sealing together accounted for another combined 52 percent of project spending. There was some variability between implementers. However, most implementers spent a similar average amount per project, linked to the $5,000 maximum provided by the EnergyWise program. Average investment, by measure type and by implementer, is shown in Figure 3.

Figure 3. Breakdown of average investments by implementer

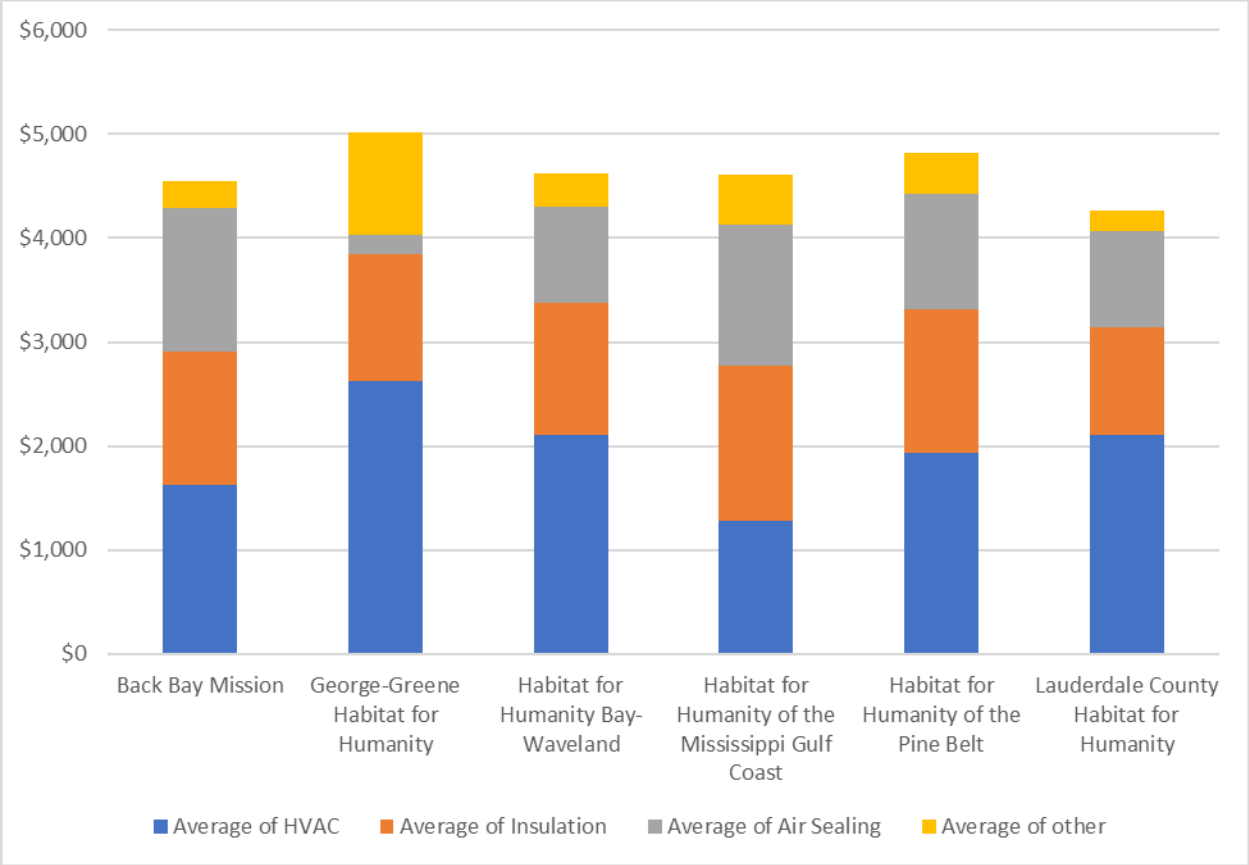


Table 2. Percentage of budget spent on each measure by implementer

Measure Type	George-Greene Habitat for Humanity	Habitat for Humanity Bay-Waveland	Habitat for Humanity of the Mississippi Gulf Coast	Hattiesburg Area Habitat for Humanity	Lauderdale County Habitat for Humanity	Back Bay Mission	Total
Average of HVAC	52%	45%	28%	40%	49%	36%	**40%**
Average of Insulation	24%	28%	32%	29%	24%	28%	**28%**
Average of Air Sealing	4%	20%	29%	23%	22%	30%	**24%**
Other	20%	7%	11%	8%	5%	6%	**7%**

Table 3 below shows the average amount invested in each measure type, by implementer. George-Greene Habitat for Humanity averaged the greatest investment in HVAC, Habitat for Humanity of the Pine Belt averaged the greatest investment in insulation, and Back Bay Mission averaged the most in air sealing/infiltration. Overall, average project spending was similar for each implementer and varied within a range of about $500.

Table 3. Average investment by measure type by implementer

Measure Type	George-Greene Habitat for Humanity	Habitat for Humanity Bay-Waveland	Habitat for Humanity of the Mississippi Gulf Coast	Habitat for Humanity of the Pine Belt	Lauderdale County Habitat for Humanity	Back Bay Mission
Ventilation	$118	$81	$34	$68	$36	$50
HVAC	$2,629	$2,104	$1,285	$1,938	$2,111	$1,629
Insulation	$1,216	$1,278	$1,492	$1,377	$1,031	$1,282
Appliances	$-	$10	$17	$19	$7	$35
Windows & Exterior Doors	$105	$54	$102	$93	$10	$121
Lighting	$73	$78	$129	$58	$12	$53
General Repairs	$280	$61	$203	$140	$112	$-
Water Efficiency	$265	$30	$5	$13	$9	$-
Exterior	$148	$12	$-	$1	$12	$-
Air Sealing	$186	$919	$1,348	$1,111	$928	$1,379
Average of Total Amt. Spent	$5,019	$4,626	$4,613	$4,818	$4,269	$4,527

Table 4 shows the average investment by measure type for all implementers combined. HVAC, insulation and air sealing were the major investments across all implementers. While HVAC had the highest mean investment, insulation had the higher median investment. This suggests that more projects received greater investment in insulation, while HVAC investments often had higher costs but

also greater variability between projects. All measures had higher average spending than median spending, which indicates that the cost distributions for each measure were skewed toward higher costs, perhaps by outlier projects with large costs in a given measure type.

Table 4. Average investment amount by measure type

Investment Type	Average Amount Spent	Median Amount Spent
HVAC	$1,961.84	$1,356.00
Insulation	$1,665.26	$1,498.00
Air Sealing	$1,150.99	$1,020.00
General Repairs	$269.87	$240.75
Windows & Exterior Doors	$252.11	$150.00
Ventilation	$254.04	$150.00
Lighting	$196.97	$156.00
Exterior	$170.02	$50.00
Water Efficiency	$139.44	$65.03
Appliances	$117.94	$75.00

These improvements, in addition to the other variables described in Section 3.2, helped RiverView determine the estimated project savings in Table 5. The projected average savings vary from 12 percent to 26 percent by implementer, with the average of 17 percent across all implementers. RiverView used its estimation methodology to estimate the impact of the measures taken in the program. In our energy bill analysis, we found that these estimates differed from the results in our analysis of a sample of program participants. We expect that most of the difference is not due to the efficiency of the measures installed, but to consumer behavior (e.g., keep using a window air conditioner even after the installation of a central air conditioner) and the changes in occupancy rates and frequency of the measures being used.

Table 5. Comparison of projected savings

Implementer	Average of Projected Annual $ Saving	Average of Projected Annual % Savings	Count of Project
George-Greene Habitat for Humanity	$604	26%	21
Habitat for Humanity Bay-Waveland	$245	16%	116
Habitat for Humanity of the Mississippi Gulf Coast	$342	19%	114
Hattiesburg Area Habitat for Humanity	$351	18%	135
Lauderdale County Habitat for Humanity	$197	12%	70
Back Bay Mission	$241	12%	64
Total	**$301**	**17%**	**520**

3.4. Energy and Bill Impact Analysis

Project Sampling

We took a sample of projects to evaluate the overall energy usage impacts of the EnergyWise Program. Before randomly selecting a sample of projects, we narrowed down the population of the projects for our analysis using a few criteria. First, we excluded projects for which implementers spent a substantial amount on repair and home retrofit measures unrelated to energy efficiency, in addition to the energy efficiency projects funded by the EnergyWise program. This criterion reduced the project population from approximately 700 to 518. Second, we only selected projects that were finished before April 2019 in order to avoid impacts on energy usage related to the COVID-19 pandemic. This way, we could review energy bill data between May 2019 and April 2020 without substantial effects from the pandemic. Out of a total population of 518, we removed 113 samples that did not meet the mentioned criteria. We then randomly selected 80 samples out of the remaining population of 405 with an expectation that results of our analysis come with a margin of error of +/-10 percent at a 90 percent confidence interval. (That is, that we can be 90 percent confident that our results lie within +/- 10 percent of the actual population values.)

As the next step, we reviewed all the key data (such as energy usage and bill payment) required for our analysis for each of the randomly selected households. We received data from several sources to calculate the impact on energy usage and bills for our sample. RiverView provided some of the data we needed through its project energy audits reports. These reports included historical bill and usage data from before any measures were installed. However, they did not include data from after the measures were installed. GCCF helped us obtain energy bill and usage data from MPC for our EnergyWise sample for the period between May 2019 and April 2020. Upon reviewing energy bill and usage data, we decided to remove 24 samples. Eight of these samples were removed because they lacked existing energy audit data needed for historical consumption and bill data. We also removed samples with no matching address between our energy audit and MPC data. Finally, we removed data when we could not confirm its accuracy. For example, there were several instances where we had more than one entry from MPC for a single month on the same date with conflicting entries. In one specific sample, there were nearly 30 entries for a single month with different extremely high kWh values. Out of a total population of 405, this process reduced our sample size from 80 to 56, which still ensures that our results have a margin of error of +/-10 percent at a 90 percent confidence interval.

Weather-Normalization

Finally, we normalized monthly kWh usage results for weather effects by developing a multiplier based on heating and cooling degree days. The U.S. Energy Information Administration describes degree days as a measure of "how cold or warm a location is."[15] Degree days are calculated by taking the difference

[15] U.S. Energy Information Administration. "Units and calculators explained: Degree days." Accessed June 10, 2021. Available at: https://www.eia.gov/energyexplained/units-and-calculators/degree-days.php.

in a mean daily temperature and base temperature (typically 65 degrees Fahrenheit) in a specific location. Each difference of 1 degree Fahrenheit in the average temperature for a given day is considered a degree day. On hot days, where the mean temperature is higher than 65, each 1-degree difference is called a cooling degree day. On cold days, the corresponding difference is called a heating degree day.

Using degree days, we account for variation in temperature between years. We obtained heating and cooling degree day data for Hattiesburg, Mississippi from the National Oceanic and Atmospheric Administration (NOAA).[16] We then normalized energy use data for every month in our sample using the following formula:

Equation 1: Weather Normalization Formula

$$WeatherNormal\ kWh = Base\ kWh + (Monthly\ Electric\ Usage - Base\ kWh) \times (\sum Normal\ Degree\ days \div \sum Actual\ Degree\ Days)$$

We calculated Base kWh for each sample by taking the average of the two months with the lowest kWh consumption over the 12-month sample period. This is meant to estimate the basic level of energy usage for that specific homeowner that reflects consumption for appliances and lighting that are not substantially affected by climate and thus are relatively constant throughout a year. Normal degree days are the average number of degree days in a given month (calculated in the NOAA data and constant over the period). Normal and actual degrees days were calculated as the sum of heating and cooling degree days in a given month. We normalized monthly kWh consumption for entries in both our "before" improvement data and "after" improvement data. The mean of the degree days multiplier was 1.04. This means that on average the weather was more moderate during the study period than during normal weather.

Overview of Results

Overall, our energy usage analysis found that the EnergyWise program decreased energy bills and energy usage. Table 6 presents the summary statistics for our sample.

[16] National Oceanic and Atmospheric Administration. "National Centers for Environmental Information." Available at: https://www.ncdc.noaa.gov/.

Table 6: Summary of usage and bills before and after the program for the sample projects

	Avg. Per Month (Before)	Avg. Per Month (After)	Avg. Change Per Month	Avg. Change Per Year	Avg. Percent Change
Bill	$144.31	$138.84	$(5.47)	$(65.61)	-3.79%
Usage (kWh)	1156 kWh	1078 kWh	-78 kWh	-935 kWh	-6.7%
Bill (2021 Rates Applied to Usage)	$152.81	$143.35	$(9.46)	$(113.53)	-6.19%

In nominal terms, monthly costs only decreased by about five dollars. However, to account for inflation and other changes in energy prices, we calculated what the pre-project energy bill would cost with the current energy rates. We found that after this correction, the projects decreased average monthly energy bills by $9.46, or about $113 per year on average. In addition, we found that consumption also decreased across the sample by about 78 kWh per month or 935 kWh per year on average. This decrease represents about 6.7 percent of the usage prior to EnergyWise projects. In contrast, the energy auditor RiverView had predicted a 17 percent decrease in annual consumption (as shown in Table 5). However, among homeowners whose energy use decreased, energy usage decreased by an average of 18 percent. In our interview with the auditor, we discussed some of the challenges that may have accounted for this variation.

In our interview, RiverView discussed some of the challenges it faced while completing the program. One problem the firm ran into was that homeowners would keep using their window air conditioning units for auxiliary cooling even after a central unit was installed. Riverview noted that this essentially erased the energy savings benefits from those houses. Similarly, some homeowners did not have air conditioning before the program, so this led to an increase in energy usage in some cases.

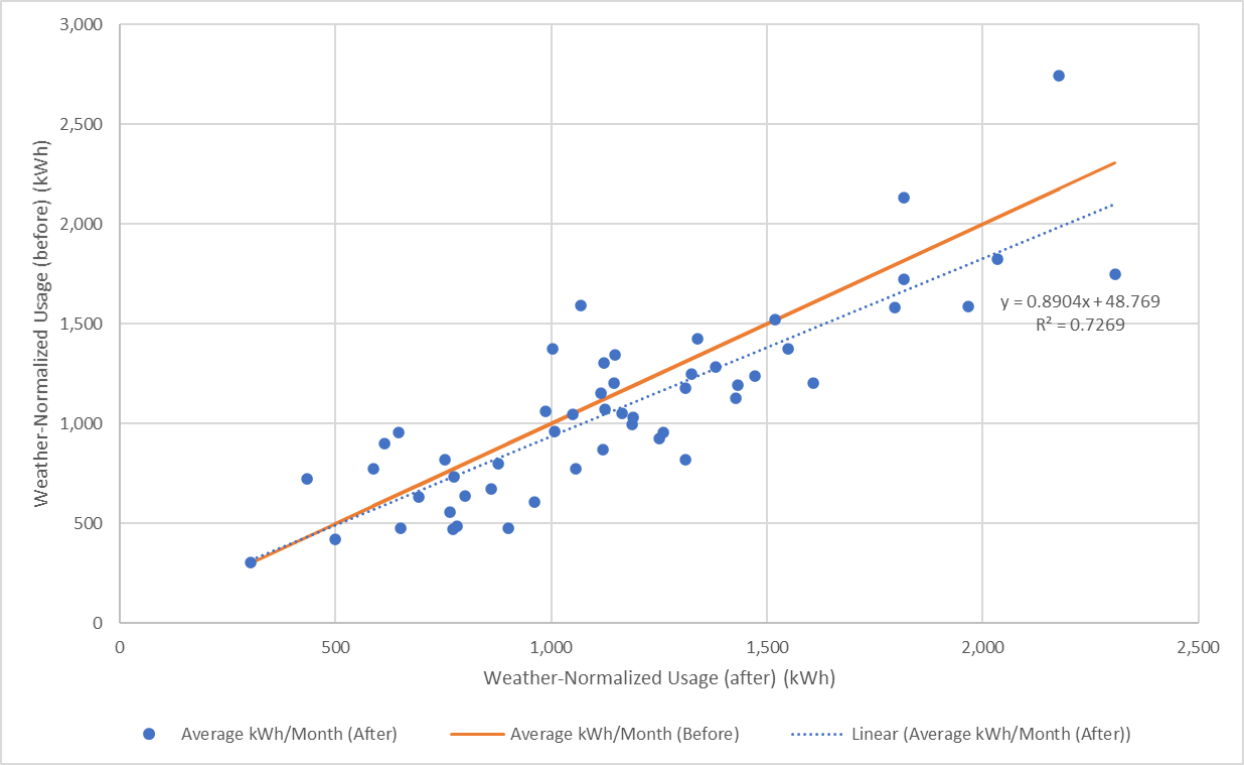
Another problem mentioned in the RiverView interview was that some of the older homes encountered problems when a heat pump was installed. If the house was not air sealed effectively, heat pumps were not able to warm the house enough. This meant heat pumps were running inefficiently for extended periods of time, and a furnace may have been a more effective measure in some instances.

As discussed further below, it is also possible that residents of these homes exhibited “rebound” behavior in which reduced energy bills and a more comfortable home allowed them to feel more comfortable using more electricity, either for comfort or for other purposes to improve their quality of life.

Variability in Results

While there was an average reduction in both energy usage and costs, the actual results showed substantial variability. Figure 4 evaluates this variability across the entire sample.

Figure 4: Impact of program by project



Each blue dot in Figure 4 represents average monthly energy usage for a participant before (x axis) and after (y axis) the EnergyWise program. If a home's energy use was unaffected by the program, its usage would fall on or around the orange line, where usage before equals usage after. Points below the orange line use less energy after the project, while those above it use more. The dotted blue line shows the best fit to the observed data. The fact that this line has a slope below one (it is about 0.89) indicates that homes which use more energy saw greater savings, on average.

Another way of presenting the difference in observed savings by consumption level is to group the sample projects into three different usage bins: (a) less than 750 kWh; (b) over 750 kWh and less than 1,500 kWh, and (c) greater than 1,500 kWh. We used these thresholds because we observed that energy usage levels tend to increase at a steeper level for customers with consumption above 1,500 kWh. We then divided the lower usage customer group into two groups using 750 kWh as the mid-point usage level. The results of this analysis are shown in Table 7. Consistent with Figure 4, we found that higher usage customers reduced consumption after the program participation: about a 11 percent reduction for the group between 750 and 1,500 kWh and about 7 percent for the group with greater than 1,500 kWh. We also found that lower usage customers at less than 750 kWh increased their consumption, on average. The increase in electric use by these lower-use households is a larger percentage (15 percent) than the savings for higher-consumption households, but the changes in kWh and monetary terms are smaller. In total, in 17 projects residents used more energy after the program, and of this population, seven households increased their energy usage by more than 25 percent.

Table 7: Average change in energy consumption by tier

Avg. kWh Consumed Before Program	Percent Change	Average Change in Monthly kWh	Average Change in Annual kWh	Count
Less Than 750	14.6%	95	1140	8
Over 750 and less than 1500	-10.9%	-107	-1287	35
Greater than 1500	-6.5%	-114	-1365	10
Overall	-6.7%	-78	-935	53

One variable that partially accounts for the usage increase trend is the rebound effect. Now that it costs less to use the equipment in the house, and the equipment is more effective, homeowners may be more comfortable using it more frequently; or they may choose to use other appliances more often now that their energy bills for heating and cooling are lower. In fact, GCCF staff mentioned that many program participants with lower electricity usage did not have working air conditioning units before the energy renovation project under the EnergyWise program. This is a clear potential factor that led to a substantial increase in energy usage for the low-usage customers. Such an increase in consumption benefits program participants by markedly improving living environment and even safety given the high average temperature and humidity levels in the summer season in the state.[17] These non-energy benefits are discussed in detailed in Section 4 along with several examples of states which recognize and attach monetary values for improving comfort, health, and safety conditions when evaluating the cost-effectiveness of energy efficiency programs.

The measures taken in the EnergyWise program generally sought to increase both efficacy and comfort, so this is not necessarily a negative effect from the program. Participants in our survey unanimously agreed that the program increased both comfort and safety in their homes. While some of these changes can likely be attributed to the rebound affect, there are likely other variables that have contributed to some of the larger increases.

In addition, there are a series of variables that could have had an impact on energy usage. As mentioned by Riverview in our interview, some customers continued to run their window air conditioning unit even after the improvements. Other variables could have included new or additional people moving into the improved home, or more random effects such as different travel behavior during the years before and after the project was completed, the addition of a new electric appliance, or a participant may have

[17] CurrentResults.com. *Weather and science facts*. "Average Summer Humidity by USA State" https://www.currentresults.com/Weather/US/humidity-by-state-in-summer.php.

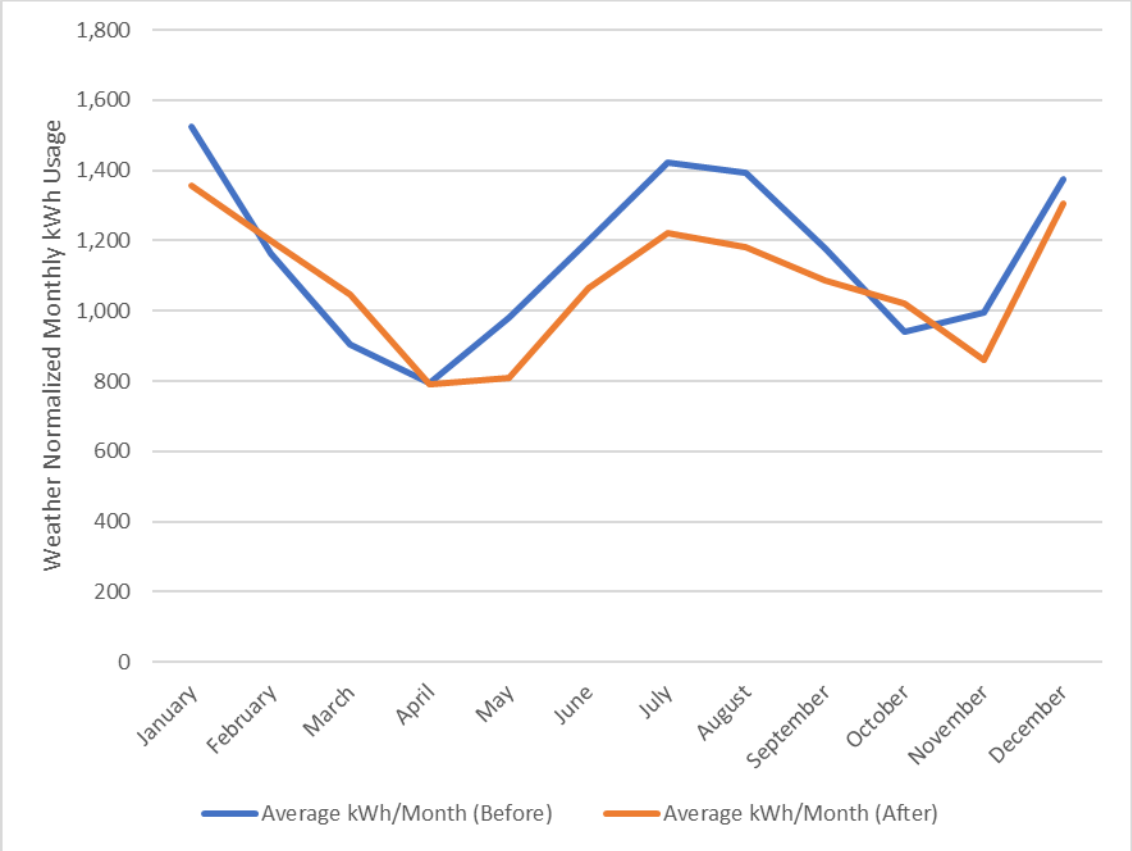
gotten sick and had to spend more time at home using energy. Similarly, homeowners may have had an air conditioning unit that did not function beforehand and now have a functioning unit.

In our analysis above, we did not account for these random variables, but only accounted for weather impacts on energy usage and potential impacts from the COVID-19 outbreak (the usage data used in the analysis are from pre-COVID periods). We believe that various other factors, some of which are identified above, may have influenced energy usage after the EnergyWise program implementation beyond the impacts of energy efficiency measures. Thus, we recommend that the EnergyWise administrator investigate energy usage further to identify major factors that affected energy usage beyond energy efficiency measures. In particular, it is important to examine the impacts of occupancy rates, how residents use equipment, and how they changed the way they use equipment after the energy improvement projects (e.g., temperature setting).

Results by Month

We also examined how the EnergyWise program affected energy usage in every month. Figure 5 shows the average energy usage for an EnergyWise homeowner by month.

Figure 5: Energy usage by month



While electric usage decreased in most months, the most notable difference was during the summer months. Electric prices are generally at their highest in Mississippi during the summer, so this efficiency increase will be impactful moving forward. During shoulder months (such as April and October), energy usage remained largely unchanged. This energy usage may be less weather dependent, so the HVAC and insulation measures installed had little to no impact on electric usage during these months.

4. NON-ENERGY BENEFITS

Energy efficiency measures provide not just benefits in terms of energy savings, but also various other non-energy benefits (NEB). Such benefits include improved comfort, health benefits, increased property value, and reduced bill collection costs for utilities.[18] Many utilities across the country incorporate certain NEBs when evaluating benefits and costs of energy efficiency programs, in particular for low-income customer programs. NEBs can be broken out into two categories: utility system NEBs and participant NEBs.[19]

Utility system NEBs include reduced credit and collection costs, and, in the event these are not quantified as direct electric system benefits, reduced risk and increased reliability.[20]

Participant NEBs are benefits realized by participants in energy efficiency programs outside of bill savings (which are typically reflected as avoided electric system costs). This list includes avoided operations and maintenance costs, increased comfort, increase participant health and safety, increased productivity, increased aesthetics, and increased property or asset value. Additional benefits specific to low-income customers may be included as participant NEBs, although some jurisdictions categorize these benefits separately. Low-income benefits include alleviating poverty, improving resiliency, and reducing home foreclosures.[21] Similarly, our stakeholder outreach (Section 5) identified several NEBs, especially increased comfort and improved health and safety conditions.

Figure 6 below displays the number of U.S. states that include each NEB within the two NEB categories: utility and participant (referred to below as host customer). The NEB that appears most frequently in cost-effectiveness tests is for additional benefits to low-income customers.

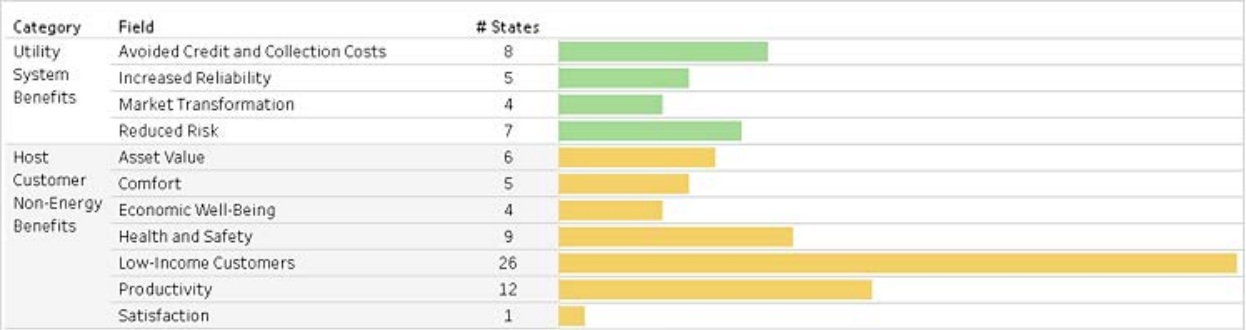
[18] Schiller, S., Skumatx, L., Carvallo, J., Burdette, J., Klucher, M. 2016. *Evaluating and Quantifying the Non-Energy Impacts of Energy Efficiency*. Lawrence Berkley National Laboratory. Available at: https://emp.lbl.gov/publications/evaluating-and-quantifying-non-energy.

[19] National Energy Screening Project.. 2017. *National Standard Practice Manual*. Page 18. Available at: https://www.nationalenergyscreeningproject.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf.

[20] Id. Page 23.

[21] Id. Page 25.

Figure 6. Inclusion of NEBs in state primary cost-effectiveness tests



*Source: National Energy Screening Project (NESP). "*Database of Screening Practices*". Accessed May 12, 2021.Available at: https://www.nationalenergyscreeningproject.org/state-database-dsesp/database-of-state-efficiency-screening-practices/*

For NEBs to be directly included in a benefit-ratio calculation, they must first be quantified. NEBs are quantified in two ways: as monetized, measure-level benefits, or as percent adders to utility system benefits. Due to the complexity associated with estimating monetized impacts at the measure-level, the latter method is more popular.

Massachusetts, a state that uses the total resource cost (TRC) test, is one of several states that calculates NEBs at the measure-level based on evaluation study results. Since 2010, Massachusetts has quantified measure-specific NEBs. The table below shows two examples of measure sets with quantified NEBs for the 2016–2018 energy efficiency implementation period.[22] Notably, the sample low-income measure includes a wider range of NEBs than the sample residential measure.

[22] Tetra Tech. 2018. Program Administrators of Massachusetts – Non-Energy Impact Framework Study Report. Available at: https://ma-eeac.org/wp-content/uploads/NEI-Framework-Study-Report.pdf.

Table 8. Massachusetts NEBs for sample measures

NEB Category	Value	Unit
Low Income Multifamily Retrofit Air Sealing		
Thermal Comfort	$30.23	Per unit, annually
Noise Reduction	$16.39	Per unit, annually
Home Durability	$10.61	Per unit, annually
Health Benefits	$5.69	Per unit, annually
Property Durability	$2.58	Per unit, annually
Reduced Tenant Complaints	$1.37	Per unit, annually
Rental Unit Marketability	$0.07	Per unit, annually
Rental Unit Increased Property Value	$1.19	Per unit, one time
Property Value Increase	$144.93	Per unit, one time
Residential Heating & Cooling Equipment Furnace w/ECM 97%		
Thermal Comfort	$27.18	Per unit, annually
Home Durability	$7.12	Per unit, annually
Equipment Maintenance	$11.98	Per unit, annually
Health Benefits	$0.87	Per unit, annually
Property Value Increase	$379.29	Per unit, one time

Tetra Tech. 2018. Program Administrators of Massachusetts – Non-Energy Impact Framework Study Report. Available at: https://ma-eeac.org/wp-content/uploads/NEI-Framework-Study-Report.pdf.

Meanwhile, Colorado is an example of a state that accounts for NEBs using high-level adders. In a 2008 decision, the Colorado Public Utilities Commission determined that NEBs would be accounted for using a 10 percent adder on top of all quantifiable benefits. For low-income programs, an additional 20 percent would be added to the total benefits to represent the higher level of NEBs likely to accrue to low-income customers.[23]

Not all states attempt to quantify NEBs. NEBs can be regarded as qualitative factors to cost-effectiveness tests rather than given a dollar value. For instance, a state could allow a program administrator to offer a non-cost-effective program if the program, for example, provided significant job benefits. Low-income NEBs in particular are often acknowledged but not monetized. Several states, including California, Florida, Oklahoma, and North Carolina, exempt low-income programs from passing their standard cost-effectiveness tests.[24]

[23] CO Public Utilities Commission. 2008. *In the matter of the application of Public Service Company of Colorado for authority to implement an enhanced demand-side management program and to revise its demand-side management cost adjustment mechanism to include current cost recovery and incentives, order granting application in part*. Docket No. 07A-420E, decision no. C08-0560. Adopted May 23, 2008. Pages 26-27, 43.

[24] NESP. "Database of Screening Practices (DSP)". Accessed May 12, 2021.Available at: https://www.nationalenergyscreeningproject.org/state-database-dsesp/database-of-state-efficiency-screening-practices/.

As discussed in the next section, we found participants in the EnergyWise program experienced various non-energy benefits, as has been recognized in other jurisdictions. Such benefits include improved comfort and safety, reduced illness, and improved ability to pay for food and other necessities.

While a cost-effectiveness analysis is not required for the EnergyWise program, MPC is required to conduct cost-effectiveness analysis for its low-income program SELECT. MPC should consider incorporating non-energy benefits into its cost-effectiveness analysis, or at least evaluate and report non-energy benefits that its program participants are experiencing.

5. STAKEHOLDER FEEDBACK

5.1. Approach Summary

We conducted interviews for each group of stakeholders in the program in order to identify how various aspects of the program (e.g., program design, delivery and operating process) are working well or not working well for program participants and implementers. We also sought specific areas for improvement. We conducted all of our interviews over the phone or in video meetings. These interviews included:

- several informational phone calls with GCCF,
- an interview and email correspondence with Riverview, the energy auditor of the program,
- three implementer interviews and email correspondences,
- two contractor interviews and email correspondences, and
- a participant survey with four responses.

The interviews were conducted in the above order.

5.2. Overview of Survey Sample

We were able to get in touch with each of the implementers we interviewed through GCCF. In our implementer interviews, we asked for participant and contractor contact information. Each implementer was able to give us contractor information, although only Back Bay Mission was able to help us with obtain participant feedback. Due to confidentiality concerns, we did not directly reach out to the program participants.

We reached out to each contractor recommended to us by the implementers. Interestingly, each of the implementers recommended that we speak with the same contractor, and we were able to speak with this contractor. In addition, the Hancock Resource Center provided contact information for a second contractor interview.

5.3. Participant Feedback

Overview and Motivation for Participation

We developed a survey in order to receive participant feedback. Our survey was distributed by Back Bay and received four responses. This survey was conducted in person by a representative from the organization.

Other implementers were unable to assist with the survey because they lacked the time and resources to do so. They were also unable to provide participant contact information, although we did ask each implementer and contractor, as well as Riverview, about participant reactions to the program.

All of the survey respondents were either aged 64 or older, were receiving disability payments, or had enrolled children in school. Most of our respondents heard about the program through word of mouth. In our survey responses, none of the participants had any complaints about the program.

Benefits to Participation

Interestingly, some of our survey respondents did not note a decrease in their energy bill. One respondent stated that their bills had remained about the same. However, the same respondent noted improved safety and comfort as a result of the program improvements. Similarly, one respondent noted that she was using less energy, but that her energy burden had still increased due to an increase in energy cost. The other two respondents noted a decrease in their energy bills.

Importantly, participants noted the following non- energy benefits:

- Improved ability to pay for food and other necessities
- Improved comfort
- Improved safety
- "No longer needs to ask for help"
- Reduced illness

Our respondents unanimously listed both comfort and safety as benefits of the program. Participants also unanimously agreed that they would not have been able to install any of the measures without the EnergyWise Program.

In addition, several of the participants were able to receive other repairs, including sheetrock and roofing repairs, because of the program.

The implementers we interviewed were also able to relay feedback they heard from their participants. Participant feedback included statements like, "the floors are no longer freezing," and "I don't have to run my unit constantly." They further explained that upgrades such as switching from window air conditioning units to central air made large improvements in customer comfort/health. In addition, implementers explained insulation has been one of the most effective measures installed (specifically

spray foam). One implementer described improvements to comfort/health as the most important benefit from the program.

Participant Feedback for Improvement

While overall the participant feedback was very positive, our discussion with contractors and implementers revealed a few areas where the program could be improved.

One contractor mentioned that participants often wanted specific measures installed in their homes, but instead had measures chosen for them. GCCF staff also noted that participants overwhelmingly requested new windows and doors, but the program did not recommend them due to a low return on investment and limited resources. Nevertheless, a future program could allow participants to have more input in which measures are installed in their homes.

Both contractors and implementers mentioned that participants had considerable difficulty with smart thermostats. In particular, homeowners who were less "technologically inclined" would sometimes require contractors to return in order to re-explain the new measure installed in their home. However, every participant stated that the guidance they received on operating and maintaining newly installed measures was adequate.

5.4. Implementer Feedback

Overview and Motivation for Participation

Similar to our sample in Section 2, we interviewed implementers that mainly focused on energy efficiency improvements. The implementers we interviewed included:

- Back Bay Mission
- Habitat for Humanity of the Pine Belt
- Habitat for Humanity of the Gulf Coast

We also spoke with the Hancock Resource Center, which helped us get in touch with contractors in the program.

Each of the implementers we interviewed shared a common motivation for participating in the program: *helping participants*. Each implementer was able to utilize energy efficiency as a measure to help improve the quality of participants lives while overall reducing their monthly energy bills.

Feedback on Administration

Implementers feel the program is being run effectively. They all agreed that the administrative steps required were effective (e.g., paperwork to help determine eligibility) and that the administrative allowance of $750 per home (recently increased to $850) was able to cover their organization's cost.

Some implementers mentioned that they occasionally had to be "creative" with their application of the allowance, but also noted that this was not overly burdensome.

Implementers were grateful for the measures offered and dollar amounts awarded for energy efficiency improvements; although, they noted that additional funds could always help. One of the implementers covered additional improvements to the home (i.e., general repairs, windows) and described the funds from EnergyWise as "one of the funding inputs" for the work that they did. Another implementer mentioned that windows would be a nice addition to the program, specifically because many of the participants had wood pane windows, but the implementer also understood that windows are an expensive improvement. Two measures we specifically asked implementers about were hot water heat pumps and smart power strips. None of the implementers had installed these measures.

Overall, implementers feel the program is being run effectively, and each implementer would appreciate additional funding to provide increased value to program participants.

Feedback for Improvement

Two of the three implementers we spoke with mentioned that participants often asked for general improvements to their homes (e.g., siding, flooring, or roofing improvements). Often, the extent of these issues was outside the EnergyWise Program scope. In an effort to help homeowners, one of these implementers partnered with local people/organizations to help provide materials and improvements to participants homes (e.g., Lowes and Home Depot) to help. This implementer mentioned that they did not have the resources available to do all the work that the participants needed on their homes. Another implementer was able to make some of these improvements but noted that it was becoming more difficult with the increasing cost of construction materials.

One of the implementers mentioned that it was difficult to understand the metrics of success for the programs. Specifically, they thought it was challenging to understand how the savings rates were calculated for each project by the program auditor. Sometimes, it seemed like they would make the same improvements on two separate projects, but RiverView's model results would show drastically different amounts of savings.

Challenges

There were several difficulties that each implementer faced during their interactions with participants. The impacts of COVID-19 complicated the program for all the implementers. They were forced to limit visits to participant homes and one contractor noted a substantial decrease in the number of projects that they managed.

Another implementer mentioned that, in general, it has been hard to stay in contact with participants. They noted that participants often change phone numbers or forget to call back. In addition, some contractors/implementers mentioned difficulties with explaining how to use technology to participants. Specifically, digital thermostats were difficult to explain to less "technologically inclined" participants. This led some of the implementers to only install manual thermometers in participant homes. Notably,

the three implementers we interviewed all used the same contractor for the bulk of their work in homes. Some of the implementers had had a few issues with contractor management originally, but most of these issues have been largely resolved. In addition, one implementer mentioned that it was occasionally restricting to only help participants served by MPC.

Notable Differences Between Implementers

One notable difference between implementers was the breadth of marketing techniques used to contact and locate participants. One of the organizations mentioned that its reputation in the community helped it sustain a manageable number of clients. Other implementers took more active measures locate participants. These measures have included:

- Collaborating with United Way and MPC (both refer potential participants to the program)
- Pamphlets
- Phone calls
- Facebook posts
- Local fliers
- Website posts
- Yard signs
- Going door to door
- Word of mouth

One implementer mentioned that they would like assistance with finding more eligible participants. Specifically, they had experienced difficulty with finding participants serviced by MPC.

Overall, implementers were grateful for the measures available in the EnergyWise Program. Implementers were unanimously motivated by their desire to help their communities. They all mentioned that they would appreciate additional funding to broaden and increase the scope of their work, but emphasized that the current system was effective in supporting them.

5.5. Contractor Interview Summary

Overview

We interviewed two contractors as part of our stakeholder survey. These contractors completed a large portion of the recent work for the program. Combined, these contractors have combined for several hundred EnergyWise projects since 2016.

Both contractors we spoke with were recommended to us by program implementers. Furthermore, one of the contractors we interviewed worked with each of the implementers we spoke with, while the other contractor also worked with several implementers.

Both contractors we spoke with used subcontractors for a few jobs but were able to do most of the improvements directly. The contractors we interviewed installed measures such as insulation, HVAC, and air sealing. One of the contractors also had a door-to-door sales team that helped bring in many projects. In addition, both contractors were Building Performance Institute, or BPI, certified, and had a

team with other types of qualifications. One of the contractors also had experience working with several of MPC's energy efficiency programs.

Contractors generally made two to four trips to each participant's home. The number of trips was dependent on the scope and scale of the necessary improvements. For example, one contractor mentioned that they would do their own initial inspection of the house and would then send a different team for each type of improvement that needed to be done (e.g., one team for insulation and one team for HVAC). Contractors also took the time to explain the installed measures if the participant wanted to know more.

Contractors had some input, depending on the implementer, into the scope of the work done on the house. One contractor noted that they had "no input" with some implementers, while they had the authority to "choose recommendations" with another. The other contractor noted that the implementers trusted their input and listened to their recommendations. This contractor also noted that they would sometimes push back on the listed recommendations on the initial report if the budget would not allow for the improvements.

Contractor Benefits to Participation

One of the contractors we spoke with mentioned the main benefit of the program was helping participants. They noted that it was "particularly rewarding to give something to someone who would not have it" without the EnergyWise program. They also noted that seeing "how thankful customers were" because of their work was rewarding.

In addition, both contractors we spoke with mentioned that the additional business was helpful. One of the contractors even hired employees as a result of the business from the EnergyWise program.

Contractor Feedback

Both of the contractors we spoke with had varying levels of difficulty with the final audits. One of the contractors specifically mentioned that the final audits were not well done. Specifically, this contractor mentioned that the auditor would sometimes miss improvements that had been installed or would not respond to follow-up questions about the scope of the work on the project.

Similarly, contractors sometimes struggled to meet the list of measures on the initial audit report. This was greatly impacted by the rising cost of insulation and other construction materials. However, contractors were often able to respond and give some input in the process. This occasionally involved changing the project budget or decreasing the scope of the work.

We asked the contractors what measures were most effective in improving participant homes and if any measures should be added to the program. Both contractors seemed to agree that given the budget of the program, the right improvements were being targeted. In regard to measures, one contractor mentioned that both air sealing (especially in the Gulf Coast's climate zone) and insulation were the most effective measures in participant homes.

We also discussed equipment challenges with each of the contractors. One contractor thought the sizing of the HVAC equipment was often incorrect, but also noted that it might be too expensive to complete an industry standard report such as Manual J with a tight budget.[25] Programmable thermostats were also an issue and were a common reason contractors would have to return to customer homes. This resulted in some lost time, as the programmable thermostats were rarely, if ever, improperly installed. Finally, one contractor also mentioned that performing tune-ups on participant air conditioning units was also sometimes ineffective and impractical, as the units would sometimes die just a few months later.

One of the contractors we spoke with specifically took the time to note that one implementer was not requiring carbon monoxide detectors to be installed in projects. This contractor mentioned that they would still always install both carbon monoxide detectors and smoke detectors in participant homes if the homes do not have those detectors. Participant homes were often at risk of carbon monoxide poisoning, and this risk was heightened when air sealing and insulation decreased airflow in the home.

5.6. Energy Auditor Feedback

RiverView was the only energy auditor in the program. In our interview, Riverview discussed its calculation of the savings rate, the processes it went through during inspections, and the improvements made in the program. While most of the information we gathered from this interview was already included in prior sections of the report, we address some of RiverView's feedback here regarding program implementation.

One of the topics the auditor mentioned was difficulty in retaining contractors. At times, even with fair compensation, contractors would not be interested in participating in the program. In addition, RiverView noted that some contractors were much more effective than others.

We also discussed the effectiveness of specific measures and tests. RiverView was in charge of sizing HVAC. In some projects, RiverView would use a Manual J; however, it would usually just keep the same size unit as previously installed in customer homes. Notably, this could still lead to large energy savings, as the newly installed units were often much more efficient than the older units. For example, newly installed heat pumps had a minimum Seasonal Energy Efficiency Ratio (SEER) of 14. In terms of measure efficacy, RiverView mentioned that spray foam has been particularly effective.

[25] Manual J is a HVAC sizing methodology developed by the Air Conditioning Contractors of America.

6. REVIEW OF ENERGYWISE AND MS POWER'S LOW-INCOME PROGRAM

6.1. High-Level Comparison of EnergyWise and MPC's Low-Income Program

As a part of this evaluation, we reviewed, assessed, and compared the EnergyWise program with MPC's low-income program called SELECT. For EnergyWise, we drew on information we obtained through interviews with GCCF, RiverView, and program implementers, contractors, and participants, as well as our review of the EnergyWise program guidelines and energy audit reports. For MPC's low-income programs, we reviewed the latest energy efficiency annual report[26] and plan[27] for both SELECT and the previous low-income energy efficiency program, the Neighborhood Efficiency Program.[28] We also contacted MPC for program details that were not included in these documents.

The specific areas of this investigation include measure types, delivery mechanisms, customer outreach and marketing, and program performance, are detailed in Table 9.

Table 9. Comparison of SELECT and EnergyWise low-income energy efficiency programs

	SELECT	**EnergyWise**
Eligibility	Customers in a neighborhood with an average income of <200% of the federal poverty level[29]	• Resident's income is at or below 200% of FPL • Must be an MPC customer
Targeting and outreach	With input from community leaders, churches, and low-income interest groups, MPC identifies and targets qualified neighborhoods. MPC sends a letter to qualifying customers to inform them about the program offering and that a contractor will contact them about making energy efficiency upgrades. The contractor immediately canvases the neighborhood using door-to-door solicitation, door tags, follow up phone calls and yard signs. MPC estimates that this process yields a 50%	Preference for applicants who are: • at or below 100% of the FPL • Elderly (age 65 years and older) • Disabled (receiving public or private disability payments) • Have children in primary or secondary schools or younger • In a home with a high energy burden

[26] MPC. 2020. DSM Report. MPSC Docket No. 2019-UA-231.

[27] MPC. 2020. 2021 Annual Energy Delivery Plan. MPSC Docket No. 2019-UA-231.

[28] The Neighborhood Efficiency Program is described in Southeast Energy Efficiency Alliance. 2016. *Utility-administered Low-Income Programs in the Southeast*. Available at https://seealliance.org/wp-content/uploads/Low-Income-Landscape-Assessment-FINAL.pdf.

[29] Correspondence with M. Pruitt of MPC, April 26, 2021.

	SELECT	EnergyWise
	area saturation rate.[30] Outside of targeted areas, customers can qualify via a partnership with Catholic Charities.[31]	
Types of measures	LED bulbs (12 per participant) Attic insulation up to R38[32]	Insulation: up to R-38 in attic, up to R-19 in floor HVAC: clean and tune, duct repair/replacement, central system replacement Air filtration, sealing, & ventilation Appliances: clean refrigerator coils, dryer hose/install screened vent; repair or replace water heater, refrigerator Windows & ext. doors: caulk & strip, repair Lighting: CFLs Water: aerators & showerheads
Delivery mechanism	Audit, direct install	Audit, direct install
Repairs	No	Yes – energy-related repairs up to $500 per customer, including framing or repairing windows and doors that could not otherwise be caulked or weather-stripped and providing protective materials and minor roof repair. Health & safety considered on case-by-case basis [33]
Payment formula	Paid to contractors based on square footage. There is no cap on spending per participant.[34]	Max of $5,000/house for material and labor (including up to $500 for repair work) plus $750/home for administrative costs
Participant cost	None	None
No. of customers	517 homes/year audited[35]	136 homes/year audited[36]

[30] Correspondence with M. Pruitt of MPC, April 26, 2021.

[31] MPC. 2020. DSM Report. MPSC Docket No. 2019-UA-231.

[32] MPC's previous low-income energy efficiency program, the Neighborhood Efficiency Program, also included HVAC tune-ups and duct sealing, in addition to the efficient lighting and insulation upgrades provided by SELECT. (MS Power 2019. 2018 Energy Efficiency Annual Report, MPSC Docket No. 2014-UN-0010, p. 5).

[33] GCCF. 2015. Residential Weatherization & Energy Efficiency Guidelines, Rev. 9-14-15.

[34] Correspondence with M. Pruitt of MPC, April 26, 2021.

[35] Annualized based on actual number of audits for the 9 months from January to September 2020, 388 homes. (MS Power DSM Report, Table 2).

[36] Averaged over the period from of September 2015 to March 2021.

	SELECT	EnergyWise
Annual program costs	$254,709[37]	Approximately $480,000 per year
Cost per participant	$492[38]	Approximately $4,700 excluding the administrative costs
Savings per participant	687 kWh[39]	Approximately 2,360 kWh projected[40] with 935 kWh verified in this study including rebound and other behavior effects

6.2. Features of EnergyWise that Could Be Integrated into SELECT

Based on our review of the features of the EnergyWise program and SELECT, we identified four specific areas from the EnergyWise program that could be incorporated into SELECT. These areas are customer targeting, eligible measures, repairs, and budget.

Customer targeting

The EnergyWise program uses a number of eligibility criteria to ensure that the program serves low-income customers. Specifically, household income must at or below 200 percent of the federal poverty level. Further, the EnergyWise program guidelines call for giving priority to applicants who are:

- At or below 100 percent of the FPL
- Elderly (age 65 years and older)
- Disabled (receiving public or private disability payments)
- Have children in primary or secondary schools or younger
- In a home with a high energy burden[41]

For SELECT, we do not have information on the geographic granularity that MPC uses for identifying neighborhoods to target. Larger geographic areas, such as census tracts or zip codes, will typically include households with a wider range of income levels. Smaller geographic areas, such as census block groups, will generally be more effective for targeting low-income populations. If MPC does not already do so, MPC should use a fine geographic unit, such as census block groups, to identify and target areas for the program. Alternatively, SELECT could use a targeting methodology such as EnergyWise uses that focuses on individual household eligibility.

[37] Annualized based on actual costs of $191,031 for the 9 months from January to September 2020. (MS Power DSM Report, Table 2).

[38] Excludes marketing and advertising, evaluation, measurement, and verification, program planning, and cross-cutting expenses. MS Power DSM Report, Table 2.

[39] Assumes 2020 savings per participant.

[40] Based on RiverView's data for energy savings (17 percent) and usage data for the sample projects we analyzed in Section 3 of this report.

[41] GCCF. 2015. *GCCF Residential Weatherization & Energy Efficiency Guidelines*, p. 8-10.

Further, MPC should consider prioritizing customers or neighborhoods with mean income levels closer to 100 percent of the federal poverty level, as EnergyWise does. Shifting to focus on 100 percent of federal poverty level rather than the higher threshold currently used by MPC (200 percent of federal poverty level) may improve targeting and the ability of the program to provide energy savings and other benefits to those with the greatest need. This approach is particularly important in light of the prevalence of low-income households in Mississippi. In 2019, Mississippi's share of the population with an income of less than 200 percent of the federal poverty level was over 40 percent, second only to Puerto Rico.[42] EIA estimates that low-income customers in Mississippi have the highest energy burden across all the states in the nation. On average, low-income customers in the state are using about 12 to 14 percent of their income on energy bills, with electricity being a critical input to remaining safe during summer heat.[43]

Eligible measures

The EnergyWise program offers a wide range of measures to participants: efficient bulbs; attic and floor insulation; HVAC clean and tune, duct repair or replacement, and central HVAC system replacement including heat pumps; air filtration, sealing, and ventilation; water heater and refrigerator repair or replacement; windows and exterior door caulking, weather-stripping, and repair; and faucet aerators and showerheads. This relatively comprehensive set of offerings will generally achieve deep savings, and in fact the American Council for an Energy-Efficiency Economy (ACEEE) found that high-performing low-income programs offer a similarly wide range of measures.[44] This approach is appropriate, especially given the high electricity savings potential of low-income households in Mississippi and other southern states (ranging from 25 to 29 percent).[45] In contrast, savings per participant for SELECT are relatively low at 5 percent.[46] Our understanding is that this represents modeled savings estimates similar to the type of savings estimates for the EnergyWise program provided by the EnergyWise program's auditor. SELECT's offerings are currently limited to attic insulation and LED bulbs. MPC should consider offering all of the measures provided by EnergyWise. Also, given the high prevalence of electric space and water

[42] Kaiser Family Foundation. "Distribution of the Total Population by Federal Poverty Level (above and below 200% FPL)." Accessed May 17, 2021.Available at: www.kff.org/other/state-indicator/population-up-to-200-fpl/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Under%20200%25%22,%22sort%22:%22desc%22%7D.

[43] U.S. Department of Energy. 2018. *Low-Income Household Energy Burden Varies Among States — Efficiency Can Help In All of Them*. https://www.energy.gov/sites/prod/files/2019/01/f58/WIP-Energy-Burden_final.pdf.

[44] Gilleo, A., S. Nowak, and A. Drehobl. 2017. *Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs*. American Council for an Energy-Efficient Economy. Available at: https://www.aceee.org/research-report/u1713

[45] U.S. Department of Energy. 2018. *Low-Income Household Energy Burden Varies Among States*.

[46] Based on average annual savings for SELECT participants in 2020, as a share of average annual residential sales per customers in 2019, per EIA 861 data.

heating in the East South-Central region of the United States, including Mississippi, MPC could also offer heat pumps to customers who are currently using electric resistance equipment.[47]

Repairs

Another good feature of EnergyWise is that it allows implementers to use up to $500 for incidental repairs.[48] These are repairs necessary for the effective performance or preservation of weatherization materials. SELECT is not designed to make repairs or identify or provide recommendations on any observed health and safety issues in a customer's home. This aspect of the program limits who can receive services, because problems with building conditions are common in low-income households.[49] Energy efficiency measures could make a home unsafe if health and safety issues such as mold or radon are present. Other issues with building condition, such as holes in walls, windows, or roofs, would reduce the effectiveness of energy efficiency measures. In order to address these problems, SELECT should include health and safety screening to prevent installation of measures that could potentially create or exacerbate health and safety problems. In addition, MPC should consider providing repair work, free of charge, for building condition issues that will reduce the effectiveness of recommended, covered energy efficiency measures or where such measures could result in or worsen existing health and safety problems. At a minimum, SELECT should offer guidance to customers on how to address health and safety problems that are obvious to auditors.

Budget

To accommodate the changes noted above, SELECT will likely need to spend more per participant. EnergyWise spends up to $5,000 per participant. In contrast, SELECT spends roughly $500 per participant on average. This clearly shows there are more savings opportunities that SELECT can tap into.

We also find that SELECT should receive a larger budget overall based on our review of program budget within MPC's energy efficiency programs, and in comparison to budget levels dedicated to low-income programs in other jurisdictions. In absolute terms, MPC spending on low-income energy efficiency declined substantially with the transition from the Neighborhood Efficiency program, with expenses of $1.07 million in 2019, to the SELECT program, with $0.25 million in expenses for 2020 (annualized). While the impact of COVID-19 may have reduced MPC's ability to implement the program, projected expenditures for 2021 ($0.49 million) is still substantially lower than 2019 spending.

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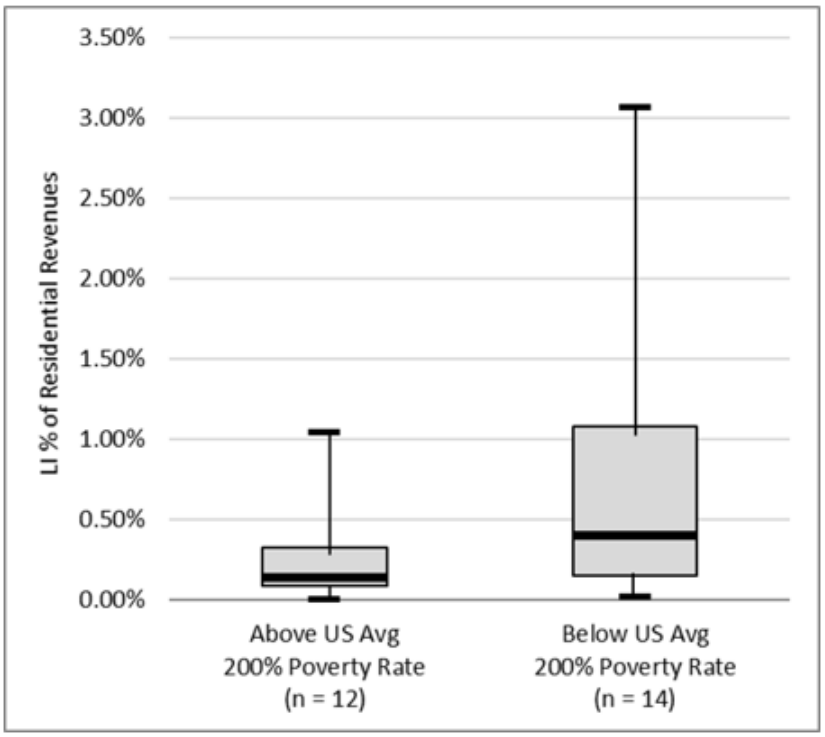
[47] U.S. Energy Information Administration. 2018. "Residential Energy Consumption Survey." Table HC6.8 *Space heating in homes in the South and West regions*, 2015. Available at: https://www.eia.gov/consumption/residential/data/2015/hc/php/hc6.8.php.

[48] GCCF. 2015. GCCF Residential Weatherization & Energy Efficiency Guidelines, p. 16-17.

[49] For example, low-income families are more likely to live in housing with heating and electrical problems and without adequate insulation and heating capacity. (Hernandez, D., Y. Aratani, Y. Jiang. 2014. Energy Insecurity among Families with Children. National Center for Children in Poverty.)

Relative to MPC's total energy efficiency portfolio budget, the budget for the SELECT program is about 12 percent. This is a decrease from the budget for the MPC's previous low-income program, Neighborhood Efficiency, which was roughly 26 percent of MPC's total energy efficiency portfolio. For 2018 and 2019, the budget for Neighborhood Efficiency averaged 0.33 percent of residential revenues. In contrast, the budget for SELECT averages only 0.12 percent of residential revenue.[50] We compared this budget level with low-income energy efficiency spending in other states. We find that MPC's low-income energy efficiency budget is low compared to budget levels for low-income programs in areas with above average poverty rates, such as Mississippi, and is very low compared to areas with below average poverty rates, as shown in Figure 7.

Figure 7. Utility low-income efficiency program budget as a percent of residential revenues



Mississippi is in the group with above average poverty rate (US Avg 200% Poverty Rate).
Source: Kallay, J. et al. Kallay et al. 2016. "Opportunities to Ramp Up Low-Income Energy Efficiency to Meet State and National Climate Policy Goals." Proceeding of the 2016 ACEEE Summer Study of Energy Efficiency in Buildings. Table 1. https://www.synapse-energy.com/sites/default/files/Opportunities-Low-Income-EE-66-015.pdf

[50] This assumes no revenue growth from 2019 to 2020 and 2021.

Research shows that utilities that spend more on their low-income customer efficiency programs tend to achieve higher savings for these customers.[51] In order to address high energy burdens and the high poverty rate, MPC should increase the budget per participant for the SELECT program. Or MPC could also consider developing other low-income programs or making the EnergyWise program part of its portfolio with continuous funding.

7. FINDINGS AND RECOMMENDATIONS

7.1. Findings and Recommendations for EnergyWise

- **Energy savings estimates**:
  - Our analysis found that real-world changes in energy use did not track with the energy auditor's estimates and were highly variable. We believe various factors may have influenced energy usage after the EnergyWise program implementation beyond the impacts of energy efficiency measures (e.g., consumer behavior and the changes in occupancy rates and frequency of the measures being used). We recommend EnergyWise investigate energy usage further to identify major factors that affected energy usage beyond energy efficiency measures. In particular, it is important to examine the impacts of occupancy rates and how residents use equipment or how they changed the way they use equipment after the energy improvement projects (e.g., thermostat settings).
- **Customer target**:
  - The GCCF target for the number of participants in each municipal district within each division was proportionally based on the number of residential electric customers, but did not take into account the number of low-income customers. We recommend GCCF investigate income levels or energy burdens (spending on energy as a percent of income) in each municipal district within each division and consider making adjustments to the target numbers of potential participants by taking into account the population of low-income customers in each service area. One useful tool for this assessment is U.S. DOE's Low-Income Affordability Data (LEAD) Tool.[52] LEAD provides energy burden estimates by county and census tract.
  - We found that observed energy savings were larger for customers whose energy use was higher before the projects. We recommend that GCCF prioritize participants who report high electric bills in order to generate the largest savings.
- **Customer outreach**:

[51] Gilleo, A., S. Nowak, and A. Drehobl. 2017. *Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs*. American Council for an Energy-Efficient Economy.

[52] U.S. DOE. n.d. "Low-Income Energy Affordability Data (LEAD) Tool." Available at: https://www.energy.gov/eere/slsc/maps/lead-tool.

- Our survey found that one implementer had experienced difficulty with finding participants served by the utility. GCCF should consider providing some assistance to implementers to find program participants. This could include GCCF requesting assistance from MPC, and could be associated with efforts to find customers who currently have particularly high energy bills or energy burden.

- **Customer choice feedback on measure installations**:
  - Our survey found that participants often wanted specific measures installed in their homes, but had no influence on the choice of measures. We recommend that EnergyWise consider establishing a process to receive and address participants' feedback or concerns (e.g., by providing further education about why such measures are important or necessary)
- **Metrics of success and projected savings estimates**:
  - Our survey found that one implementer found it difficult to understand the metrics of success for the program, in particular how the savings rates were calculated for each project by the program auditor. We recommend that GCCF establish the metrics of success for the program, if they are not yet established, and make sure that GCCF conveys this to both the program auditor and the local implementers. We also recommend that the program auditor provide a brief explanation to the local implementers about how the savings estimates were developed.
- **Customer confusion about programmable thermostats**:
  - Our survey found that digital thermostats were difficult to explain to less "technologically inclined" participants. This led some of the implementers to only install manual thermometers in participant homes. We recommend GCCF examine features of available smart thermostat products and select specific products that are easy to understand and easy to use by the participants, or try other ways to provide technical assistance to participants that do not require contractors or implementers to revisit the home.
- **Customer education on new appliances and equipment**:
  - Our survey found that some homeowners would keep using their window air conditioning units for auxiliary cooling even after a central unit was installed. We recommend GCCF work with the implementer and contractors and make sure that they provide more education to participants as to how to use new electric appliances and equipment in order to ensure the participants achieve the full energy savings from the program.
- **HVAC sizing**:
  - Our survey found that one contractor thinks the sizing of the HVAC equipment was often incorrect. Sizing HVAC is a very important procedure. We recommend GCCF investigate how much it would cost to conduct a proper HVAC sizing process (e.g., Manual J) and consider incorporating it as a requirement for HVAC installations by increasing the budget limit.
- **General improvements**:
  - Our survey found that participants often asked for general improvements to their homes (e.g., siding, flooring, or roofing improvements) that are outside of the scope of

the program. We recommend that implementers work with other local organizations to address participants' needs for home improvements.

- **Carbon monoxide detectors**:
  - Our survey found that one implementer was not requiring carbon monoxide detectors to be installed in projects. We recommend GCCF consider making the installation of carbon monoxide detectors a requirement for homes with gas appliances.
- **In-depth participant survey**:
  - Despite the unanimous positive feedback from program participants, it is important to note that we received participant interviews with just four participants. While our interviews with implementers and contractors echoed what we learned from the participant interviews, we recommend GCCF conduct a more in-depth participant survey to confirm the results of our limited survey and also seek other feedback. Similar to our bill impact analysis, we recommend that this in-depth survey include at least 50 program participants. Such a survey process could provide information about participant behavior before and after the projects, including thermostat temperature settings as well as non-energy benefits. The survey process could also ensure that all equipment is working properly.
  - We also recommend that GCCF make participant surveys part of the program implementation process. Such a survey process would require the local implementers or a different organization to pay a visit to the participants to conduct a survey at the end of the project.

7.2. Findings and Recommendations for MPC's SELECT

- **Customer targeting**:
  - For SELECT, we do not have information on the geographic granularity that MPC uses for identifying neighborhoods to target. If MPC does not use small geographic areas, such as census block groups, MPC should consider using such a fine geographic unit to identify and target areas for the program. Alternatively, SELECT could use a targeting methodology focused on individual household eligibility, such as that used by EnergyWise.
  - MPC should consider prioritizing customers or neighborhoods with mean income levels closer to 100 percent of the federal poverty level, as EnergyWise does. Shifting to focus on 100 percent of the federal poverty level rather than the higher threshold currently used by MPC (200 percent of the federal poverty level) may improve targeting and the ability of the program to provide energy savings and other benefits to those with the greatest need. MPC should also consider partnering with community-based organizations to conduct some or all of the outreach to help build trust with potential participants.
- **Eligible measures**:
  - SELECT's offerings are currently limited to attic insulation and LED bulbs. MPC should consider offering all of the measures provided by EnergyWise.
  - Also, given the high prevalence of electric space and water heating in the East South-Central region of the United States, including Mississippi, MPC could also offer heat pumps to customers who are currently using electric resistance equipment.

- **Repairs**:
    - SELECT is not designed to identify or provide recommendations on any observed health and safety issues in a customer's home. When homes have existing health and safety issues (e.g., mold, carbon monoxide leak), some energy efficiency measures (e.g., insulation and air sealing) can exacerbate such problems or create additional problems. SELECT should include health and safety screening to prevent installation of measures that could lead to or exacerbate health and safety problems.
    - In addition, MPC should consider providing repair work free of charge for building condition issues that will reduce the effectiveness of recommended, covered energy efficiency measures or where such measures could result in or worsen existing health and safety problems. At a minimum, SELECT should offer guidance to customers on how to address health and safety problems that are obvious to auditors.
- **Budget**:
    - EnergyWise currently spends up to $7,500 per participant, while SELECT spends roughly $500 per participant on average. The budget for SELECT averages only 0.12 percent of residential revenue, while programs in other jurisdictions are spending over 0.4 percent of residential revenue for programs serving customers under 200 percent of the federal poverty level. In order to address high energy burdens and the high poverty rate, MPC should increase the budget per participant for the SELECT program.
    - MPC could also consider developing other low-income programs or making EnergyWise part of its portfolio with continuous funding.
- **Non-energy benefits**:
    - Our review of non-energy benefits revealed that efficiency programs in other jurisdictions recognize and incorporate values of NEBs in their cost-effectiveness analysis and NEBs are typically higher for low-income programs. MPC is required to conduct cost-effectiveness analysis for its SELECT program. MPC should consider incorporating non-energy benefits—including avoided arrearages and collection costs—into its cost-effectiveness analysis or at least evaluate and report non-energy benefits that its program participants are experiencing.

Appendix A. GCCF Residential Weatherization & Energy Efficiency Guidelines

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GCCF Residential Weatherization & Energy Efficiency

Guidelines

Table of Contents

INTRODUCTION

The Gulf Coast Community Foundation (GCCF) has received a grant from Mississippi Power Company (MPC) pursuant to a settlement agreement between MPC and the Sierra Club. The grant is to fund the administration and operation of the Energy Efficiency & Renewable Program, a program (a) to provide the most effective possible energy efficiency services to low-income households in the Mississippi Power service area, and (b) to provide grant funding to 501(c)(3) entities and public educational institutions within the Mississippi Power service area for installation of renewable energy equipment. These Guidelines apply to the portion of the program that provides energy efficiency services to low-income housesholds.

The purpose of the residential housing energy efficiency program (Program) is to improve the conditions of substandard housing and to enable low-income Mississippi Power customers to lower their energy burden. The Program is designed to assist low-income families by providing the most effective possible weatherization and energy efficiency services.

This Low-Income Weatherization & Energy Efficiency Program Manual provides standards concerning the proper administration of the Program and delivery of weatherization and energy efficiency services. These guidelines are designed to ensure that weatherization services are delivered consistently.

To implement the Program, GCCF intends to make sub-grants to non-profit organizations that have demonstrated the ability to and are currently providing similar services in MPC's service area (Sub-Grantees). The Sub-Grantee will perform the energy efficiency services, as described below, on homes of qualified applicants in accordance with these Guidelines. To the extent available, Sub-Grantees are encouraged to utilize other resources to make needed improvements to home not covered by this Program.

The objective of this document is three-fold.

First, it provides information on the administrative (reporting and financial) requirements of which Sub-Grantees must be aware and follow.
Second, it serves to define the appropriate process and application of weatherization measures. This document describes steps that should be followed to complete each measure and material specifications. Alternative methods are allowed, but whatever method is used must meet or exceed the standards described.
Third, it provides standards for quality of the work. Procedures are included for evaluating the quality of each installed measure and the overall quality of the completed job.

GCCF reserves the right to modify these guidelines from time to time as the Program progresses.

1. Sub-Grantees

1.1. GCCF will make sub-grants to non-profit organizations that have demonstrated the ability to and are currently providing similar weatherization and home energy savings service programs in MPC's service area (Sub-Grantees). The Sub-Grantee will perform the energy efficiency services on homes of qualified applicants in accordance with these Guidelines.

1.2. Initially, GCCF will make grants of working funds to selected Sub-Grantees for a prescribed number of homes. Sub-Grantees will:

1.2.1. Identify, take applications from, qualify, and document priority applicants to participate in the Program;

1.2.2. Schedule a home energy auditor, either hired by GCCF or by Sub-Grantee, who will perform a home audit and prepare a report on the services to be performed on the home;

1.2.3. Prepare and fully execute a Program work plan for each home, which may be executed by personnel of Sub-Grantee or by subcontractor of Sub-Grantee;

1.2.4. Assure that all Program work has been performed in a workmanlike manner and in accordance with all applicable local, State and Federal laws, rules and regulations;

1.2.5. Schedule a post-work energy audit to verify that the Program work has been satisfactorily completed;

1.2.6. Obtain all Program documentation from and coordinate all activites with the homeowners;

1.2.7. Guarantee to the owner for a period of twelve (12) months from the date of final acceptance of services and materials (except for normal wear and tear), that any defects in material or workmanship shall be corrected at the expense of Sub-Grantee or its subcontractor; All manufacturer warranties will be assigned or transferred to the homeowner at final acceptance of the work performed;

1.2.8. Provide GCCF with reports of work performed, expenditures on the program and such other information as may be required from time to time;

1.2.9. Maintain financial records, supporting documents, statistical records, and all Program or other records pertaining to the grant for a period of four (4) years from the date of submission of the final expenditure report, provided, in the event of any litigation, claim or audit, the records must be maintained until all litigation, claims or audit findings involving the records have been resolved and final action taken; and

1.2.10. Provide homeowner weatherization education from the initial energy audit throughout the weatherization of the home.

1.3. During the term of the Program, Sub-Grantees and all subcontractors of Sub-Grantee shall carry or require that there be carried, the following insurance with companies authorized to write such insurance in the State of Mississippi;

1.3.1. Workers Compensation Insurance in accordance with the Mississippi State Worker's Compensation Laws;

1.3.2. Automobile liability insurance with limits of at least $300,000 bodily injury/death and $100,000 property damage;

1.3.3. Commercial General Liability insurance of a minimum $1,000,000 per occurrence, and $1,000,000 aggregate according to MS State Law. GCCF shall be named as an additional insured on this policy.

1.4. During the term of the Program, Sub-Grantees and/or its subcontractors shall obtain and maintain in full force and effect all certifications, permits and approvals as may be required to perform the Program work. Upon request, Sub-Grantee shall provide GCCF or its designee, copies and verification of compliance with the requirement.

1.5. If Sub-Grantee is permitted by GCCF to perform home energy audits, the person performing those audits shall be qualified and experienced in performing such audits.

1.6. Sub-Grantee and its subcontractor shall at all times be independent contractors of GCCF. Nothing in any agreement between the parties or in these guidelines shall be interpreted to make GCCF and Sub-Grantee or its subcontractors agents, partners, joint venturers or liable for the actions or inactions of the other.

1.7. GCCF reserves the right, but shall not be obligated, to fully monitor and audit Sub-Grantee's performance to this Program and the work. Sub-Grantee shall fully cooperate in all such monitering and audits and provide at no cost to GCCF access to Program files and information.

2. Required Activities and Policies

2.1.1. There are four activities that must be completed on every home weatherized and each is listed below.

1. The Initial Energy Audit – indicates the problems and where they are located. It determines the Scope of Work (SOW).
2. The Work – based on the energy audit, improves the energy efficiency of the home while ensuring the health and safety of the occupants.
3. The Final Energy Audit – ensures the work was completed in a competent and workman-like manner and that all materials have been properly installed.
4. Homeowner Education – helps the homeowner's family understand the changes in their home and maximize the financial benefits those changes will bring.

2.1.2. Initial Energy Audit

Measures to be taken on the home are determined by visual inspections in the initial energy audit and a blower door test. The Auditor performing the blower door test shall be trained and experienced. The Auditor will write up a general Scope of Work that describes the work requirements to weatherize the home in the most impactful manner that results in a more comfortable home and the most energy saving activities within the budget. The Sub-Grantee shall write up a more in-depth Scope of Work (SOW).

2.1.3. The Work

Sub-Grantee and its subcontractors shall perform the Program Work in a good, workmanlike, safe, and effective manner according to the manufacturer's instructions and applicable standards. Sub-Grantee shall assign to homeowners all manufacuter and sub-contractor warranties applicable to the Program work.

2.1.4. The Final Energy Audit

The Auditor is also responsible for inspecting all Program Work following completion to assure that it was done in accordance with the SOWs and in a good and workmanlike manner. The Auditor shall discuss the work with the homeowner and obtain homeowner's written concurrance that the work was satisfactorily completed. Deficiencies discovered by the Auditor or complaints by the homeowner shall be addressed by Sub-Grantee or its sub-contractors.

No home may be reported as completed until the following conditions are met:

1. All weatherization, health and safety and other materials are installed.
2. The Auditor has performed a final inspection(s) of all work and certified that the work has been completed in a workman-like manner and in accordance with the priority determined by weatherization energy modeling software.
3. Homeowner signoff that work is completed satisfactorily.

2.1.5. Homeowner Education

Sub-Grantee or its sub-contractor shall provide Homeowners with appropriate energy efficiency education, which shall include instruction on how to operate any new equipment and how to decrease utilization of energy in the home.

3. Eligibility and Policies

3.1. General Eligibility Determination:

3.1.1. Unless otherwise directed by GCCF, Sub-Grantees may utilize their existing client selection process to determine an applicant's eligibility for this Program. A Homeowner Questionnaire can be used during the intake process to gather initial information about the home and family. A sample questionaire is found at Exhibit 13.1.

3.1.2. Sub-Grantees shall consider all applications submitted, but are not required to take a full application once the applicant provides information indicating the applicant is not eligible. If a Sub-Grantee receives a written application that does not qualify for the Program, Sub-Grantee shall notify the applicant in writing that the applicant is ineligible and state the reasons reasonably promptly for ineligibility or disqualification.

3.1.3. Sub-Grantees shall maintain copies of all applications and eligibility determination, including documentation that the applicant does or does not meet eligibility criteria. The selection records must be available for Program evaluation and monitoring purposes.

3.1.4. An eligibility certification is only good for 12 months. If Sub-Grantee does not begin Program work within 12 months of the certification, an applicant must be re-certified.

3.1.5. An applicant may withdraw the application for any reasons whatsoever prior to execution of the Conditional Grant agreement. The applicant may also be reinstated as long as he/she still qualifies for the Program.

3.1.6. An applicant may be disqualified at any point in the Program if it is discovered that the applicant made any material misrepresentation as to a material fact in connection with the Program.

3.1.7. Sub-Grantee shall not discriminate on the basis of race, color, religion (creed), gender, gender expression, age, national origin (ancestry), disability, marital status, sexual orientation, or military status, in any of its activities or operations. These activities include, but are not limited to, hiring and firing of staff, selection of volunteers and vendors, and provision of services.

3.2. Household Eligibility: To be eligible to receive Program services,

3.2.1. Applicant(s) must be the owner of the house to be weatherized and the house must be their primary residence.

3.2.2. Mobile homes shall be considered by GCCF on a case-by-case basis.

3.2.3. Applicant must be a Mississippi Power Company residential customer at that house.

3.2.4. Total household income of the Applicant and all persons (family or not and/or property owner or not) who reside in the home to be weatherized must be at or below 200% of Federal Poverty Level**. Initially, the Program will focus on Applicants at or below 100% of the Federal Poverty Level.** Household Income must be determined in the manner described below**.**

3.3. Income Levels

3.3.1. 2015 FEDERAL POVERTY INCOME GUIDELINES (to be used in all counties)

# of Home Residents	**100%**	200%
1	**$11,770**	$23,540
2	**$15,930**	$31,860
3	**$20,090**	$40,180
4	**$24,250**	$48,500
5	**$28,410**	$56,820
6	**$32,570**	$65,140
7	**$36,730**	$73,460
8	**$40,890**	$81,780
Each additional member add	**$4,160**	$8,320

3.3.2 Definition Of Income

Sub-Grantees must incorporate the following income definitions into the income guidelines for weatherization. Income means all earnings before taxes received by all persons who reside in the home of applicant during applicable tax year(s) but NOT the *Income Exclusions* listed below:

1. Any assets drawn down as withdrawals from a bank;
2. Money received from the sale of a property, house, or car;
3. One-time payments from a welfare agency to a family or person who is in temporary financial difficulty;

4. Tax refunds;

5. Gifts, loans, or lump-sum inheritances;

6. College scholarships;

7. One-time insurance payments, or compensation for injury;

8. Employee fringe benefits, food or housing received in lieu of wages;

9. The imputed value of rent from owner-occupied non-farm or farm housing;

10. Federal non-cash benefit programs such as Medicare, Medicaid, Food Stamps, school lunches, and housing assistance;

11. Combat zone pay to the military;

12. Child support.

3.4 Selection Process Among Eligible Households

Once eligibility has been determined, the priority should be given to applicants who are:

1. Elderly (age 65 years and older);
2. Disabled (receiving public or private disability payments);
3. Have children in primary or secondary schools or younger;
4. In a home with a high energy burden:
   a) (low-income household whose residential energy expenditures exceed the median level of residential expenditures for all low-income households in the State;
   b) Can demonstrate a chronic inability to pay utility bills.

Applicants with a higher priority will be provided Program service ahead of applicants with lower priority. Program Services to qualified applicants within priority groups and applicants not subject to a priority shall be taken on a "first come, first serve" basis by the date a 100% completed application is submitted.

3.5. Dwelling Ineligibility

3.5.1. A home is **ineligible** for Program Services if **any** of the following conditions exist:

1. The home is vacant;

2. Home is new construction or under construction;

3. The home is for sale;

4. Demolition of the home is scheduled within the next 12 months;

5. The home is condemned;

6. The home has serious structural problems, which make weatherization impossible, unsafe, or impractical;

7. The home is a mobile home which is not adequately installed, supported, or permanently connected to required utilities;

8. The home is a camper, recreational vehicle, or other structure designed and constructed as temporary living quarters, even if it is being used as a permanent residence;

9. The owner refuses to allow any weatherization work and/or necessary diagnostic and safety tests;

10. There are uncorrected mold problems or other documented health and safety issues that make weatherization impossible, unsafe, or impractical.

3.5.2. Sub-Grantee may **choose** to categorize a home as ineligible if the condition of the home is unsafe or in such bad state of repair that Program Services would not significantly improve energy efficiency. They include, but are not limited to:

1. There are vermin, unsanitary, or other health and safety problems on the property that present a hazard to the weatherization crew;

2. The home is being remodeled and weatherization work is not coordinated with a rehabilitation program;

3. There are moisture problems not correctable through weatherization;

4. The owner refuses to allow cost-effective measures;

5. There are unusual situations, which in the judgment of the Sub-Grantee, must be corrected before providing weatherization services;

6. Existing moisture problems that cannot be resolved under the health and safety limits;

7. The house has sewage or other sanitary problems that endangers the weatherization crew;

8. The occupant's known health condition prohibits the installation of insulation and other weatherization materials;

9. Building structure or its mechanical systems, including electrical and plumbing, are in such a poor condition and cannot be resolved in a cost effective manner or within the monetary limits of the grant;

10. The homeowner is uncooperative, physically or verbally abusive, or threatening to crew, subcontractors, auditors, inspectors, or others who must work on or visit the house;

11. Any existing condition that could endanger the health and/or safety of the crew and cannot be safely abated within the scope of weatherization.

3.5.3. Appeals Procedure

When the Sub-Grantee determines that a household is ineligible, notice in writing shall be provided to the homeowner with the reason(s) for the denial within ten (10) days. If a homeowner objects to a denial, Sub-Grantee may follow its normal review process. Copies of all documentation on the denial and the reasons for it shall be kept in the homeowner file. GCCF reserves the right, but shall have no obligation to review any denial.

4. Homeowner Related Policies

4.1. Required Homeowner Files

4.1.1. Documentation for each completed homeowner file must contain:

1. Application Form; Exhibit 13.1
2. Homeowner Agreement; Exhibit 13.2
3. Any additional forms needed during construction such as the Moisture Assessment Form (Exhibit 13.3) or the EPA Renovate Right Brochure and Signature Form, signed by the homeowner;
4. Utility Information Release Form; Exhibit 13.4
5. Income verification documentation;
6. Energy Audit, detailing all aspects of the job concerning the actual weatherization of the home, including the initial and final audits, HERS rating report, actual material used and cost, and the Work Plan (Scope of Work);
7. Completed contractor agreements and signed lien waivers, where applicable;
8. Financial documentation including purchase orders, contractor invoices (itemized list of parts and labor), bids/proposals, etc.
9. Homeowner signoff;
10. Weatherization correspondence related to the household, such as notifications, thank you letters, complaints, appeals, etc.

11. Sub-Grantee may use its own or other forms at their discretion.

4.1.2. Proof of Ownership Documentation

No title examination required, so long as the applicant can reasonably demonstrate ownership or such long-term use of the home as to indicate that applicant is likely to continue to use the home as a primary residence in the future. Ownership may be confirmed by the following:

a) Copy of homeowner's deed;
b) On-line land records indicate homeownership;
c) Tax receipts – Homestead Exemption by applicant must be filed;
d) Proof of long-term residence, more than two (2) years;
e) Homeowner must agree not to sell residence for one (1) year after Weatherization/Energy Efficiency measures completed;
f) Mississippi Power bills (twelve (12) previous months) shall be obtained from MPC;
g) Photo identification (driver's license, etc.) shall be used to document personal identity.

4.2. Homeowner Agreement

The Homeowner Agreement spells out the Program work to be completed on the home by the Sub-Grantee, the sweat equity and any financial obligations of the homeowner, provides the right of entry permission and any miscellaneous agreements between the homeowner and the Sub-Grantee. The Homeowner Agreement should include the Scope of Work as determined by the energy audit. See Exhibit 13.2 for a sample Homeowner Agreement.

Fraud or Misrepresentation

Fraud or misrepresentation on the application undermines the integrity and fairness of the Program, which is wholly dependent upon access to complete and accurate information from each Applicant. Each Applicant's obligation to provide complete and accurate information extends to the entire application process. This includes completion of the paper application, as well as an obligation to respond honestly and completely to the Housing Counselors.

Examples of fraud or misrepresentation include, but are not limited to, supplying inaccurate income information, omitting debt information on the application, or supplying inaccurate information about household size, number of occupants or composition.

4.3. Data Privacy

All electronic and hard copy individual and/or household information and records shall be maintained as confidential and shall not be disclosed or shared with third parties unless there is a written Release of Information that specifies the reason for the release and the client has signed the Release. All information provided by the homeowner shall be available to GCCF, and it auditors or designees.

5. Weatherization Activities

Sub-Grantee may perform any of the following weatherization and energy efficiency measures on a qualified home, subject to a cap on the costs of direct material and labor of $5,000.00 per house.

5.1. HVAC

1. Clean evaporator/condenser coils
2. General tune-up (including Freon check)
3. Duct repair/replace (seal connections with mastic, add strapping, correct distribution)
4. Install programmable thermostat
5. Replace filter
6. Seal and/or replace registers/grilles
7. Replace/install central system or mini-split system, provided cleaning and tuning of the existing system is not practical
8. Remove/seal/replace window units

5.2. Insulation

1. Install up to R-38 in attic
2. Install up to R-19 in raised floor system; install vapor barrier if necessary

5.3. Air Infiltration

1. Attic
    a) Weatherstrip and insulate access panel, or install attic tent over stairs

b) Seal around ceiling penetrations (light fixtures including recessed lights [specialized procedure], smoke alarm boxes)

2. Seal around HVAC registers
3. Seal HVAC closet seams and weatherstrip closet door
4. Seal HVAC return air compartment seams
5. Seal sheetrock and trim cracks and holes, including plumbing penetrations (water heater, washer, sinks, toilets) and around electrical outlets
6. Install foam gaskets in electrical outlets and light switches

5.4. Ventilation

1. Install kitchen and/or bathroom exhausts and vent to the outside
2. Install attic ventilation (solar vent, roof wind turbines, ridge vents, gable vents, soffit vents, and/or baffles)

5.5. Appliances

1. Water heater
   a) Adjust temperature to 120°
   b) Install water heater blanket
   c) Insulate water lines
   d) Repair/replace parts or install missing parts, or replace appliance with an energy factor of .90 or greater
2. Clean refrigerator coils
3. Replace refrigerator with Energy Star® model
4. Correct dryer hose flow (shorten duct); clean hose of obstructions; install screened vent to exterior

5.6. Windows & Exterior Doors

1. Caulk windows (where glass meets interior trim, or around panes)
2. Replace broken window glass
3. Apply window tint
4. Weatherstrip doors
5. Adjust or repair door jamb, frame, and/or threshold
6. Install storm door

5.7. Exterior

1. Repair minor roof leaks
2. Insulate exposed water pipes

3. Seal exterior penetrations (electrical outlets, plumbing penetrations, etc.)

5.8. Lighting

Replace incandescent bulbs with CFLs

5.9. Water Efficiency

1. Install low-flow showerheads
2. Install lavatory faucet aerators

Water Efficiency measures shall be leveraged with other funds, if possible.

5.10. Administrative Costs

Administrative costs are all costs other than weatherization activity costs.

6. Moisture Control

Auditor shall document any excessive moisture conditions in the home before any weatherization measures are installed. If the moisture condition is not to be corrected by the Program work, Auditor or Sub-Grantees shall document the problems and sources on the Moisture Assessment Form Exhibit 13.3, and have it **signed by homeowner**. Photographs of areas of concern or existing moisture areas may be placed in the homeowner file. The purposes of the photographs are to demonstrate mold and/or moisture issues **before** weatherization has taken place and to provide visual documentation for deferral or the decision to proceed with work.

Solutions and educational resources should be discussed with the homeowner and/or occupant to determine roles in creation of problems and mitigation. Homeowners may be given a copy of the Environmental Protection Agency (EPA) brochure, "A Brief Guide to Mold, Moisture, and Your Home" as part of the education process, Spanish version is available as well as an English version.

7. General Repair

This program does not fund rehabilitation or general repairs. Incidental Repairs refers to those repairs necessary for the effective performance or preservation of weatherization materials. Such repairs include, but are not limited to, framing or repairing windows and doors that could not otherwise be caulked or weather-stripped and providing protective materials. While repair to a roof to protect the insulation to be installed is allowable, roof

replacement or other non-energy related repairs are not a permissible use of Program funds. If incidental repairs are required and other funds are not available to fund those repairs, Sub-Grantees may use up to $500 of these weatherization funds to cover the costs for this type of work**. This Program is not under obligation nor is it meant to repair extensive deficiencies prior to weatherization.**

8. Health and Safety

The primary goal for the GCCF Weatherization & Energy Efficiency Program is to implement cost-effective weatherization procedures to conserve energy, however funds may be used to make minor repairs with prior written approval by GCCF if needed to ensure homeowner safety.

9. Indemnification

Sub-Grantee, its contractors, subcontractors, successors, and assigns will release, indemnify, defend, and hold harmless GCCF and the officers, agents, employees, successors and assigns and authorized representatives of all the foregoing from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs, expenses, and losses of whatsoever kind or nature (collectively "Losses") in connection with or incidental to the performance of this grant and any contracts or subcontracts formed due to this grant, whether arising before or after completion of the work hereunder and in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part or claimed to be caused, occasioned, or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of Grantee, contractors, subcontractors, successors, assigns, its lower-tier suppliers, subcontractors or anyone acting under its direction or control or on its behalf. The foregoing shall include, but is not limited to indemnity for: Property damage and injury or death of any person, including employees of Grantee, their contractors, and/or their subcontractors.

10. Sub-Grant Funding

10.1. GCCF and Sub-Grantee shall agree on a number of homes that will be weatherized during the initial pilot phase of this Program. GCCF reserves the right to change that number at any time, provided, however, GCCF will compensate Sub-Grantee for any Program expenses incurred prior to a change. Sub-Grantee shall have the right to approve or disapprove any increase in the number of homes to be weatherized.

10.2. GCCF will provide Sub-Grantee initial funding in an amount equal to the estimated amount of administrative cost and Program cost expected to be expended by Sub-Grantee. This initial grant shall provide Sub-Grantee operating capital.

10.3 GCCF will pay Sub-Grantee a fixed fee for all its administrative costs associated with this Program in the amount of seven hundred fifty dollars ($750.00) per home that Sub-Grantee weatherizes. In addition, GCCF will fund up to five thousand dollars ($5,000.00) per home for direct labor, materials and subcontractors to perform the weatherization. In special situations and with advanced written approval, GCCF will consider funding more than the $5,000.00 limit.

10.4 On at least a monthly basis, Sub-Grantee shall report to GCCF the Program expenditures for the prior month, to date, and expected to be spent in the following period. GCCF will grant additional funds to provided Sub-Grantee resources to complete the Program. Any unspent Program funds remaining at the completion of the Program shall be promptly returned to GCCF.

11. Reporting

11.1 Required Submissions

Required submissions to be provided to GCCF from the Auditor shall include:

1. Pre-Test Audit Report
2. Scope of Work
3. Final-Test Audit Report
4. HERS Rating Report

Required submissions to be provided to GCCF from Sub-Grantees shall include an Excel spreadsheet with the following documentation:

a) Client name;
b) Address of property;
c) City;
d) County;
e) MPC customer number;
f) Client phone number;
g) Household income;
h) Number of people living in home – broken down into Elderly, Disabled, Children, and whether there are any Veterans living in the home;
i) Year the structure was built;
j) Square footage;
k) Start Date;
l) Finish Date;
m) Type of weatherization services provided – broken down by service by cost ($);

12. Non-Compliance Procedures and Sanctions

GCCF may terminate services with Sub-Grantee at any time if the Sub-Grantee demonstrates any of the following behaviors:

- Has a documented history of poor performance;
- Is not financially stable;
- Lacks the organizational capability to carry out its responsibilities;
- Materially fails to comply with the terms and conditions of its contract with GCCF.

Exhibits

Weatherization Homeowner Questionnaire

Name:

Street address:

City, state, Zip code:

Phone number 1: _____

Phone number 2: _____

Are you the Homeowner?

Please answer the following questions regarding your home:

Can you provide us with a copy of your recent utility bills?

Has your home been weatherized before?

- ☐ Yes
- ☐ No
- ☐ Don't know

Was this home built after 1978?

- ☐ Yes
- ☐ No

☐ Don't know

Which of the following best describes your home?

☐ Single family detached
☐ Single family attached (duplex, town home, etc.)
☐ Multifamily

If Single-family detached, please check all appropriate boxes?

☐ Ranch
☐ Two-Story structure
☐ Finished Basement
☐ No Basement
☐ Unfinished crawl space
☐ Finished attic
☐ Insulated attic
☐ Insulated walls

How long have you lived at your current address? _____ (years)

Which of the categories shown best describes the total heated floor space in your home? If you are not sure, please make your best estimates.

☐ 600 to 999 square feet
☐ 1,000 to 1,599 square feet
☐ Don't know

Please check appropriate boxes describing your mechanical system?

☐ Boiler How old?
☐ Furnace How old?
☐ Central Air-Conditioning How old?
☐ Window A/C units How old?
☐ Other_____

Do you use compact fluorescent light bulbs in your lighting fixtures?

- ☐ Yes, in most lighting fixtures
- ☐ Yes, in some lighting fixtures
- ☐ No, I'm familiar with them but I don't use them

Amount of your average summer electricity bill (monthly):

Amount of your average winter electricity bill (monthly):

If you don't have this information this is fine.

In order to evaluate your total energy consumption, we will need to obtain your natural gas consumption data from your Natural Gas utility. Please provide us with:

Account number: _____

Meter Number: _____

Your appliances

How many of these appliances do you have in your home?

Kitchen

Refrigerator/freezer #_____

Age of your refrigerator in years:

- ☐ Less than 2
- ☐ 2 to 5
- ☐ 6 to 10
- ☐ more than 10

Home entertainment

Television #_____ standard #____ plasma # ____ LCD #_____

VCR #_____

DVD player #_____

Stereo #_____

Video game system #_____

Computer equipment

Computer #_____

Fax machine #_____

Scanner #_____

Printer #_____

Other (please list) _____

General appliances

Water heater #_____ ☐ electric ☐ gas How old_____

Clothes washer #_____ How old_____

Clothes dryer #_____ ☐ electric ☐ gas How old_____

Space heater #_____ ☐ electric ☐ other (list type of fuel)_____

Ceiling fan #_____

How you use energy

How often do you turn off lights that you are not using?

- ☐ Always or almost always
- ☐ Usually
- ☐ Sometimes
- ☐ Rarely
- ☐ Never or almost never
- ☐ Don't know/does not apply

Within the last five years, have you made any of the following improvements to your home?
Please check all that apply.

- ☐ Replaced windows with new energy efficient windows
- ☐ Installed storm windows
- ☐ Added weather stripping or caulking
- ☐ Upgraded insulation
- ☐ Replaced the furnace with a more efficient model
- ☐ Installed a more efficient air conditioner
  What kind?
  - ☐ Central air conditioner
  - ☐ Window air conditioner(s) #_____

  What did it replace?
  - ☐ Central air conditioner
  - ☐ Window air conditioner(s) #_____
  - ☐ No prior air conditioning
- ☐ Other _____
- ☐ Don't know/does not apply

Do you adjust or program your thermostat in order to lower your energy costs?

During the summer:

- ☐ Always or almost always
- ☐ Sometimes
- ☐ Rarely
- ☐ Never or almost never
- ☐ Don't know/does not apply

During the winter:

- ☐ Always or almost always
- ☐ Sometimes
- ☐ Rarely
- ☐ Never or almost never
- ☐ Don't know/does not apply

At what temperature do you set your thermostat?

During the summer: day _____ºF night _____ºF Don't know _____

During the winter: day _____ºF night _____ºF Don't know _____

Do you have a setback thermostat?

- ☐ Yes
- ☐ No
- ☐ Don't Know

Demographics

Number of people living in your home full-time, including yourself: _____

Do you have any children under the age of 19 currently living in your household?

☐ Yes If yes, how many _____?
☐ No

How many people currently living in your household over the age of 65?

How many people currently living in your household are disabled?

Primary language spoken at home: ☐ English ☐ Spanish ☐ Other _____

13.2. Weatherization Homeowner Agreement

Weatherization Homeowner Agreement

THIS HOMEOWNER AGREEMENT (the "Agreement") is signed on this _____ day of _____, 20____, between Habitat for Humanity Bay-Waveland Area ("Habitat"), a Mississippi nonprofit corporation with an address of 103 Central Avenue, Bay St. Louis, MS, and **_____** ("Homeowner").

Background statement

A. Homeowner is the owner of record and the primary occupant of a residence located at _____ (the "Property").

B. In keeping with its mission to provide decent, affordable housing for qualified families in Hancock or Pearl River County, MS, Habitat provides various programs for home repair and weatherization to qualified families on favorable terms. Habitat has selected Homeowner for participation in the weatherization program and Homeowner would like to participate in the Weatherization Program.

In consideration of the mutual agreements set forth in this Agreement, Habitat and Homeowner agree as follows:

1. <u>Work to be performed on the property</u>.

(a) <u>Scope of Work</u>**.** The work to be performed on the Property (the "Work") will be determined based on the energy auditor's initial report and Habitat representative(s)'s findings during an initial inspection. Homeowner understands that the scope of work will be provided to him or her by the Contractor upon initial appointment to begin Work.

(b<u>) Change Order</u>. Any Homeowner or Contractor requesting a Scope of Work revision will submit a written Change Order to Habitat. The Change Order will be reviewed, and either approved or denied by Habitat.

(b) <u>No Future Work</u>. Homeowner understands that Habitat is not undertaking performance of ongoing maintenance of the Property. Future maintenance and upkeep of the Property is solely the responsibility of Homeowner.

(c) <u>Warranty Following Completion</u>**.** Upon completion of the Work, Contractor shall warrant the project against defects in workmanship within the scope of work performed by Contractor and which arise and become known within one (1) year from the date of completion. All said defects arising after one (1) year and defects in material are not warranted by Contractor. Contractor hereby assigns to Owner all warranties on materials

as provided by the manufacturer thereof. This warranty does not cover loss or damage to personal property; loss or damage resulting from Homeowner's failure to promptly notify Habitat of a problem; normal wear and tear; or neglect of proper maintenance.

2. Right of Entry.

If Weatherization is to be performed under this Agreement, Homeowner understands that a substantial portion of the Work will be performed within Homeowner's residence. Accordingly, Homeowner agrees that Habitat and its agents, contractors, employees and volunteers may have access to the interior of the Property for the purpose of (i) inspecting, measuring and gathering information related to the Work; (ii) installing, implementing, constructing, or otherwise performing activities related to the Work; and (iii) performing any other such actions as are reasonably contemplated by the Program and this Agreement.

3. Insurance. Homeowner agrees that Homeowner holds a valid homeowner's insurance policy on the Property and that Homeowner is current in premium payments on such policy.

4. Schedule. Habitat or Habitat-appointed Contractor will cooperate with Homeowner to prepare an estimated time schedule relating to the Work, and Homeowner will make the Property available for performance of the Work on the days required by the schedule.

5. Termination of Agreement. Habitat's acceptance of Homeowner as a Habitat partner family was based on the information contained in Homeowner's application. If Habitat determines that the information contained in Homeowner's application was materially inaccurate, if there is a materially change in Homeowner's financial situation, or if the home is found to be listed for sale or rent, Habitat reserves the right to terminate this Agreement and all work will cease immediately.

6. Limitation of Liability. Neither Habitat nor its agents, contractors, directors, employees, officers, volunteers or other representatives shall have any liability or responsibility for any damage, loss or injury of any kind, direct or indirect, to any person or to any property in any way caused by or resulting from the performance of the Work in connection with this Agreement, except as caused by the negligence or willful misconduct of Habitat or any of the above-designated persons. Without limiting the generality of the foregoing, Habitat will not be liable for any alterations to the Property that normally result from the installation of any weatherization equipment or the removal of old appliances and equipment. To the extent that Habitat is found liable for property damage in accordance with this Section, Habitat shall compensate Homeowner only for the reasonable documented cost of necessary repairs directly related to the incident.

7. <u>Photograph/Video Release.</u> Homeowner grants and conveys in perpetuity to Habitat all right, title and interest in any and all photographic images, printed interviews or statements, and video or audio recordings made by Habitat and/or its agents, contractors, directors, employees, officers, volunteers, and other representatives in the course of performing the Work, including, but not limited to, any royalties, proceeds or other benefits derived from such photographs, printed materials or recordings.

8. <u>Miscellaneous</u>.

A. This is a legally binding contract. You may seek legal counsel before executing this Agreement.

B. This Agreement contains the entire agreement between Habitat and Homeowner and supersedes any and all prior oral or written statements or agreements regarding the subject matter of this Agreement. There are no promises, agreements, conditions, undertakings, warranties or representations, oral or written, express or implied, between the parties, other than as set forth in this Agreement.

C. This Agreement may only be changed by a written agreement signed by Habitat and Homeowner.

D. Homeowner may not assign its rights under this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year first written above.

Homeowner:	**Habitat for Humanity Bay-Waveland Area:**
_____	_____
Print name: _____	Print name: _____
Date: _____	Title: _____
	Date: _____

13.3. Moisture Assessment form

Weatherization Moisture Assessment and Release Form

Mold can be a problem in any home, but especially in those where there is an excessive amount of moisture or humidity present. In addition, if there are several people, pets, plants, or fish aquariums present, conditions may exist for mold to grow. An assessment of your home included a visual check for mold. This is not a mold inspection and the person making this assessment is not a mold inspector. Testing and identification of specific molds is beyond the scope of this program and we are not liable for mold that was not found during this inspection.

During the energy audit on _____ date, our personnel identified Mold growth in the following room(s) of your home located at _____:

☐ Living/Bedroom Areas ☐ Bathroom Areas
☐ Laundry Areas ☐ Combustion Areas
☐ Crawlspace Areas ☐ Attic Areas
☐ Basement Areas ☐ Other Location: _____

Moldy or musty odors are an indicator that there may be hidden mold growth.
Moldy or Musty Odors ☐ Are present ☐ Are not present

The Weatherization & Energy Efficiency Pilot Program was not funded to remedy mold problems, but some actions associated with a cost effective energy saving measure may be taken to reduce moisture problems. We will take the following measures that may help to resolve existing moisture problems:
☐ _____
☐ _____
☐ _____

Check and Sign One of the Following Disclaimers

☐ **Moisture/Mold Disclaimer**: By signing below, I acknowledge that I have received information concerning moisture and mold conditions in my home prior to any weatherization work being done and I will take steps to reduce excessive moisture. I agree to hold the agency performing weatherization harmless for any future moisture or mold problems that are not associated with the weatherization work.

_____ _____
Weatherization Homeowner Date

_____ _____

Rev. 9-14-15

Affiliate Auditor / Estimator Date

□ **Deferral Disclaimer**: By signing below, I acknowledge that I have been notified there is existing mold in the home prior to any weatherization work being done. I have been advised that the affiliate performing weatherization cannot cost effectively resolve the identified mold or moisture and that weatherization work must be deferred until the mold or moisture is remedied.

_____ _____
Weatherization Homeowner Date

_____ _____
Affiliate Auditor / Estimator Date

13.4. Utility Release Form

WEATHERIZATION PROGRAM

UTILITY INFORMATION RELEASE FORM

I, _____ hereby authorize the release of all information

pertaining to my fuel bills, both past and future, to **Habitat for Humanity** and the **Gulf Coast Community Foundation** or their designee.

Fuel Supplier(s): Name and Address: Account Number:

Electric supplier _____ _____

_____

Natural Gas supplier _____ _____

_____

Propane supplier _____ _____

_____

Other supplier _____ _____

_____

I understand that this information will be used only to provide data for the Weatherization & Energy Efficiency

Pilot Program and that the information obtained through this release shall not be made public in such a

manner that the dwelling or occupants may be identified.

Applicant
Signature:_____ Date:_____

Applicant
Address: _____

_____