Evaluation of Nantucket's Mass Save Program

Nantucket Project Center

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Abstract

The Mass Save Home Energy Assessment program was designed to promote energy conservation by Massachusetts's residents. The goal of the project was to analyze the current implementation of the program on Nantucket and identify how it could better meet the island's distinctive needs. Based on interviews and surveys we found high levels of satisfaction among program participants and relatively high levels of awareness about the program among the general population. Nevertheless, we identified key areas that could be improved and made recommendations accordingly to the Nantucket Energy Office, Conservation Services Group and Mass Save to develop the marketing and implementation of the program in the future.

Acknowledgements

We would like to thank our advisor, Professor Dominic Golding, for your help and guidance throughout this project. We thank you for affording us the opportunity to help the Town of Nantucket and its community work toward a greener future.

We would also like to thank our sponsor, Lauren Sinatra, for contributing her time, energy and knowledge towards our project. Thank you to our sponsor, the Nantucket Energy Office, for entrusting us with the task of helping to refine and improve on a program that holds such great potential and significance for this unique island.

We thank Peter Morrison, for offering beneficial input and guidance along the way. Your diligence, dedication and support allowed our project to thrive.

Additionally, we would like to thank George Aronson, Monica Tawfik, Bill Julio and Bob Eckel for allowing us to interview them and for sharing their time and knowledge of the program; the Maria Mitchell Association for graciously providing us with wonderful housing while we were on the island; Harvey Young for kindly providing bicycles to the WPI students for the duration of our stay, allowing us to see the island in an amazing way.

Finally, we would like to acknowledge and thank all the Nantucket residents who agreed to talk with us about their home energy assessment experiences or took the time to participate in our general population survey.

Executive Summary

The Mass Save program is a statewide initiative sponsored by Massachusetts's gas and electric utilities (including National Grid). The program offers no-cost home energy assessments (HEAs) to residents that provide recommendations and equipment to improve energy efficiency and reduce energy usage at home. The program has been providing assessments to homeowners and renters on the mainland for over twenty years and just recently started providing them to Nantucket residents on a consistent basis. Nantucket poses a unique challenge for energy auditors given the expense and logistical issues of travelling to and from the island. The Town of Nantucket Energy Office (NEO), National Grid, and Conservation Services Group (CSG) came together and developed a system that would allow for HEAs to be performed on the island more efficiently by scheduling them together in quarterly audit weeks. Two to three auditors travel to the island and assess around 50-60 homes during each of these specified weeks. The first audit week was held in January 2012, the second in April 2012, and the most recent in November 2012. Approximately 175 homes have now been assessed and the NEO thought it an opportune time to take stock of the program. Accordingly, the goal of our project was to evaluate the effectiveness of the program, assess its impact on the island and to provide recommendations on how it can be improved.

To achieve this goal, our group established a set of four objectives. The project team has: 1) Analyzed past energy conservation programs and energy conservation techniques; 2) Evaluated the implementation of the Mass Save Program on Nantucket; 3) Determine the current marketing, outreach efforts and public awareness of the program; and, 4) Recommended improvements to the Mass Save Program as it is implemented on Nantucket.

Objective 1 entailed an in-depth analysis of the literature on past energy efficiency programs and energy conservation methods, supplemented by interviews with key individuals involved with the implementation and facilitation of the program on Nantucket. Data was collected for Objective 2 by surveying local residents who had participated in the Mass Save program regarding logistical

arrangements, auditor characteristics, products and recommendations received, implementation of recommendations and overall satisfaction. Objective 3 was accomplished by developing a general population survey that measured public attitudes towards energy conservation and awareness of the program.

Findings

A major problem with scheduling HEAs on Nantucket is the cost and logistical problems associated with sending auditors to Nantucket from the mainland for audit weeks. Originally, the audit weeks were created so that CSG could optimize the time spent on the island and perform as many HEAs in a week as possible. However, the NEO and CSG are working together towards certifying local contractors with Mass Save to conduct HEAs and perform weatherization and insulation contract work for the program.

During our interview with representatives from CSG and National Grid, our team learned that after an assessment, CSG typically contacts homeowners by mail to follow-up and obtain feedback on their experience. Auditors on the mainland will sometimes follow up with homeowners to answer questions or discuss work. However, these follow-ups have faltered on Nantucket.

To assess the current implementation of HEAs, our team interviewed 39 Nantucket residents who had assessments about their experience and satisfaction with the program. Generally, respondents were very satisfied with the program and felt the assessment was worthwhile, although, some participants expressed concerns about the performance of the energy efficient products installed and some even removed the compact fluorescent light bulbs (CFLs) after their assessment. Overall, participants found that their auditor was “extremely” thorough, engaging and knowledgeable and consistently on-time. Regarding program improvements, residents indicated that they would like to see a greater variety of products, more information provided during an assessment and more time allotted for each assessment.

Our team surveyed 97 residents from the general population to determine public awareness of the Mass Save program on Nantucket. We found that approximately half of respondents had heard of a no-cost home energy assessment

program. Most participants had heard of the assessment program through word of mouth, newspaper advertisements and the Internet. Saving money and saving energy were the most popular motivators for making energy efficiency improvements, a statistic that can be used by the NEO in future marketing materials. Overall, our research and analysis have uncovered opportunities for refinement to improve the public awareness, implementation and effectiveness of the Mass Save program.

Conclusions and Recommendations

Through our analysis of the survey data and interviews with key stakeholders we would like to make the following recommendations to the NEO, CSG and National Grid. The recommendations are ordered in terms of importance for implementation. It is up to these three organizations to determine how each recommendation will be interpreted and implemented.

The process of sending auditors out to the island creates a bottleneck that limits when residents can sign up, extends response times, and restricts how many audits can be performed.

Recommendation 1: Develop a collaborative pilot model that would allow one or more local contractors to conduct HEAs year-round on behalf of CSG.

Many homeowners were dissatisfied with some of the products they received during their audit, some said the lights were too dim or took too long to warm up and so they replaced them with their old incandescent ones. Some participants received thermostats and only a small fraction of them were installed. Out of the ones installed, participants were not properly informed on how to program them. When they weren't installed, participants were given the thermostat to install themselves and in most cases, the participant forgot and the thermostat was never installed.

Recommendation 2: Auditors should focus specifically on providing clear information about product performance prior to installation and clear instructions about the operation of products, especially thermostats.

The HEA sign up process was very easy for most participants, however expectations and levels of preparedness varied greatly. When homeowners call to

sign up for an HEA they are informed that the audit will take about two hours, given a brief explanation of the audit procedure and are told they should provide past electricity bills to the auditor. Variations in expectations suggest that participants need more information in advance.

Recommendation 3: Inform program participants in advance about what is needed from them for the assessment and clearly explain the process of the audit, program deliverables, and follow up activities.

Follow-up is a crucial step in encouraging participants to implement energy efficiency changes in their home. Homeowners often had questions they did not think of during their audit and are unsure of whom to ask once the auditor leaves. Follow up procedure that is in use on the mainland has yet to be implemented on the island and currently there is no follow up for participants on Nantucket. Research indicates that follow up is crucial to ensure effective implementation of conservation measures.

Recommendation 4: Create a follow-up system geared to anticipate and answer questions program participants have following the assessment.

Nearly half of all the HEA participants we surveyed had heard of the program through word of mouth. All of the participants indicate they would recommend the program to a friend or family member and 75% already had. Providing participants with information to pass on to friends and neighbors would facilitate awareness and participation.

Recommendation 5: Auditors should leave Mass Save brochures with program participants after an assessment to give to their family and friends.

Although word of mouth may be the most effective form of outreach, many other avenues that are typically used to promote community events may help increase awareness of the Mass Save program.

Recommendation 6: Utilize the Internet and newspaper advertisements more to reach a greater number of residents.

Our general population survey revealed that of the participants who had heard of an HEA, only 28% of them could identify incentives offered by the program (such as CFLs and thermostats). Respondents identified saving money and energy as

the two factors most likely to motivate them to make energy saving changes to their home.

Recommendation 7: Focus on advertising the incentives offered by the program that will easily save money and energy for homeowners.

Only 44% of the HEA participants and 37% of the general population survey participants knew of the surcharge in their bill that helps pay for energy efficiency programs like the Mass Save one. Many were surprised by this news. Making this fact better known may motivate more homeowners to take advantage of the service for which they are already paying.

Recommendation 8: Include more information in bills and advertisements about the surcharge that all customers are currently paying.

Evidently, the Mass Save Home Energy Assessment program has been well received by participants and has relatively high levels of public awareness already. Our recommendations offer ways to increase awareness, broaden participation, and strengthen program implementation for the future.

Authorship

This Interactive Qualifying Project was written in collaboration with its authors: Michael Andres, Courtney Carroll and Ari Hopkinson. The entirety of the report, including all research, interviews, analysis and conclusions was completed over the course of fourteen weeks during the authors' third year in pursuit of Bachelor's degrees at Worcester Polytechnic Institute. While individual authors wrote particular sections of this report, each section was reviewed and edited by all authors to ensure the report represented the group's assessment as a whole. A list on authorship can be seen below. The two partners that are not cited as author still extensively reviewed and attributed to the section.

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1. Introduction

Increasing energy consumption is a growing problem in today's society. As population and house size increases, there is greater concern about the usage of finite, nonrenewable energy sources to generate electricity. The need for energy conservation has resulted in the creation of many energy conservation programs, like the Mass Save program. Mass Save is a statewide initiative that is sponsored by nine Massachusetts' utility companies and is available to all Massachusetts residents with the purpose of reducing household energy consumption. The program provides energy saving products and home improvement recommendations such as insulation and weatherization and provides financial incentives like no-interest loans and rebates that make home improvements more affordable. Since Mass Save is a statewide initiative, the program covers the islands off the coast like Nantucket and is especially valuable to Nantucket residents due to their high cost of electricity. Currently, there are two submarine cables that run from the mainland to Nantucket providing energy to the island. In spite of efforts by the Town of Nantucket to install renewable energy sources and decrease the amount of energy used by its citizens, there is a growing need for electricity, especially in the peak tourist season when population skyrockets from ten thousand to fifty thousand people. However, as tourism increases over time, significant stress will be placed on the existing cables and a third may need to be installed. The Nantucket Energy Office coordinates with National Grid to oversee the marketing and implementation of the Mass Save program for Nantucket residents. In order to gauge the programs' success, this project determined homeowner satisfaction with the assessments, examined the effectiveness of marketing and outreach strategies, assessed public awareness and identified weaknesses in the program. Based on interviews and surveys, we found high levels of satisfaction among program participants and relatively high levels of awareness about the program among the general population. From our data and analyses, we recommend several strategies that National Grid, Conservation Services Group and the Town of Nantucket (including the Energy Office) can adopt to enhance the effectiveness of and participation in the program on Nantucket.

2. Literature Review

The emphasis on energy conversation in the United States has waxed and waned in recent decades, but remains a prominent issue today with ongoing concerns about climate change, energy independence, and the cost of fuel. To get a better understanding and background for our project, our group researched the importance of energy conservation in general and why it has become such a prominent issue. We then looked at various conservation programs, successful energy conservation techniques and the difference between physical and behavioral energy saving strategies. With a broader understanding of the issue, we focused in on understanding the Mass Save Program itself and finally looked at the marketing aspects currently used in the program and by others. Our findings are outlined in the following literature review.

2.1 Importance of Energy Conservation

As the need for energy worldwide increases, so does the need for energy conservation. Previously, there have been conservation efforts following energy crises, when our dependence on energy was made visible. Books published during the beginning of energy conservation in the United States warned of the negative impacts our dependence on fossil fuels may have on the environment in the future. In addition, there have been efforts by national and international agencies that have pushed programs to help conserve energy. Renewable energy resources are on the rise and may be able to provide a more stable and permanent solution to our dependence on fossil fuels.

2.2 Initial Efforts Toward Energy Conservation

Public awareness about the need for energy conservation in the United States began to grow in the 1960s, fueled by increasing concern for population growth and the impact it would have on society, resources, and the environment. Books published in the 1960s and 1970s such as *The Population Bomb* by Paul & Anne Ehlrich (1968), *Silent Spring* by Rachel Carson (1962) and Barry Commoner's *The Closing Circle* (1971) encouraged greater public awareness of environmental issues

and strengthened the environmental movement. Many of the published works from this time warned of the potential harm that current activities would have on the future, specifically about the lack of regulation on pollution, the dramatic increase of the population and the inexorable increase in the consumption of resources and energy. The concerns of environmentalist groups were highlighted in the 1970s with two large energy crises: the 1973 oil crisis caused by the Arab Oil Embargo (U.S. Department of State, 1974) and the 1979 energy crisis caused by the Iranian Revolution.

2.1.1 The Role of Government in Conservation

The energy crises prompted calls for more energy conscious behavior and encouraged greater government intervention. Jimmy Carter, the 39th President of the United States, established the first set of national environmental policies in 1977. Some of the goals he established included insulating 90% of homes and buildings in America by 1985, increased use of solar energy and reducing the annual growth rate of energy demand to less than 2% (Jimmy Carter, 1977). Changes in energy prices and policies throughout the subsequent years have caused efforts in energy conservation to wax and wane. Recently, concerns about climate change have encouraged renewed efforts in energy conservation. For example, in 1988, the United Nations (UN) established the Intergovernmental Panel on Climate Change (IPCC). The purpose of the Panel was to provide a clear scientific assessment as to the causes and impacts of climate change (Intergovernmental Panel on Climate Change, 2012). In 1992, the UN also held its first Conference on Environment & Development (UNCED) in Rio de Janeiro, Brazil (the so-called Rio or Earth Summit). The Rio Summit was the first of its kind with over 170,000 participants discussing a wide range of environmental concerns and economic development (United Nations, 1997). Subsequent international agreements, such as the Kyoto Protocol and other efforts by the UN IPCC, have forced national and local governments to establish a variety of programs and policies to reduce CO2 emissions and many of these focus on improving energy conservation.

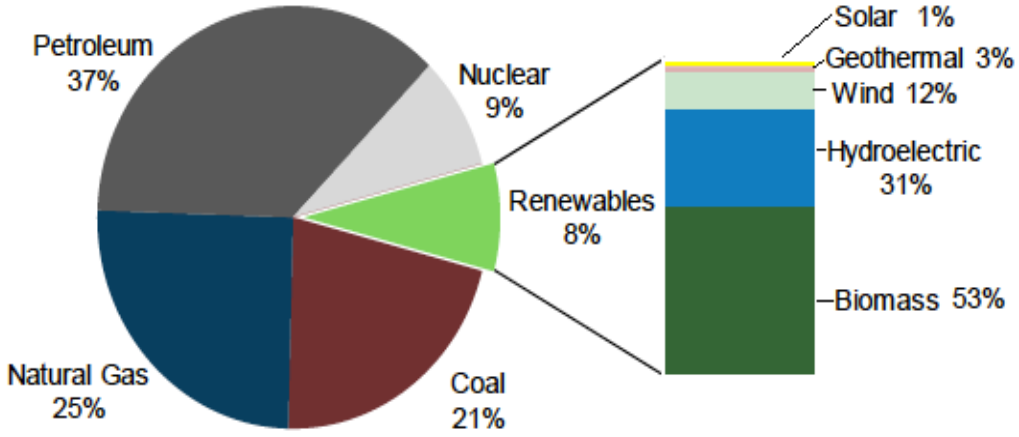
The specifics of different energy programs have changed over time, but broadly they range from efforts to regulate the energy, construction and consumer industries to efforts designed to encourage homeowner actions. For example, in 1980 the Federal Energy Administration (FEA) required that the average efficiency of appliances sold had to be 20% more efficient than appliances sold in 1972. The Energy Conservation and Production Act required the Department of Housing and Urban Development to create thermal standards for new residential and commercial building construction by 1979. The Energy Policy and Conservation Act (EPCA) encouraged the weatherization of existing structures and authorized the FEA to provide financial assistance to low-income homes. This program aimed towards the goal set during President Carter's April 1977 energy message of "insulating 90 percent of all residences" (Hirst & Carny, 1978).

In 1992, the United States Environmental Protection Agency (EPA) introduced the Energy Star program as a voluntary labeling initiative designed to identify and promote energy-efficient products and reduce energy consumption. Shortly after in 1996 the EPA partnered with the U.S. Department of Energy to expand the program's labeling to cover major appliances, office equipment, lighting, home electronics and more. Over the past 20 years, Energy Star has successfully delivered energy and cost savings across the country by saving businesses, organizations, and consumers about $18 billion in 2010 alone (Energy Star, 2012). While the Energy Star program provides recognition for energy efficient technology, the Leadership in Energy and Environmental Design (LEED) program is a certification program that provides third-party verification of green buildings. It provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions (U.S. Green Building Council, 2012).

2.1.2 Types of Energy Resources and Consumption

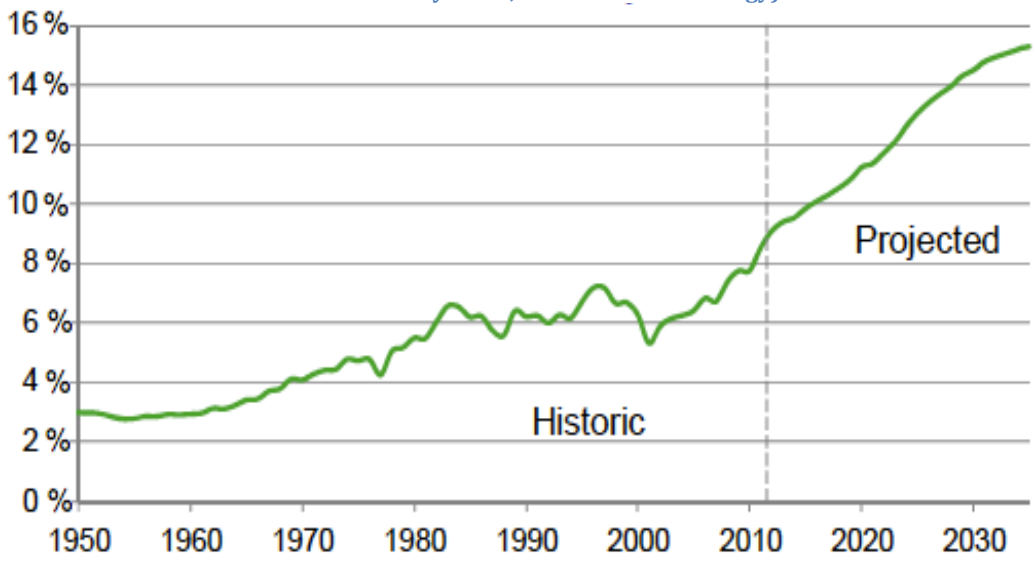
In 2010, about 83% of the energy consumed in the United States came from nonrenewable fossil fuels, 9% from nuclear and 8% from renewable sources (as seen in Figure 1).

Figure 1 - U.S. Total and Renewable Energy Consumption, 2011 (adapted from Center for Sustainable Systems, U.S. Renewable Energy)



This is a testament to the nation's dependence on nonrenewable energy sources. Since renewable energy is considered to be more beneficial environmentally and more stable economically, Figure 2 shows that renewable energy sources are predicted to rise from 8% of the overall energy consumption in the U.S. presently to about 15% in 2030 (U.S. Energy Information Administration, 2011).

Figure 2 - U.S. Renewable Energy Consumption Historic and Projected in 2011 (from Center for Sustainable Systems, U.S. Renewable Energy)



However, the majority of the U.S. energy will continue to come from finite, nonrenewable sources, for the foreseeable future, especially given the recent discovery of vast amounts of shale gas that have been made accessible through new

techniques, such as hydro-fracking and horizontal drilling. Coal, oil and natural gas-fired power plants contribute to a significant amount of carbon dioxide emissions annually. The current carbon dioxide concentration in the atmosphere is the highest it has been in the past 40,000 years and contributes to significant increases in global temperature that may have substantial adverse environmental impacts (Khoo & Tan, 2006). Since non-renewables are likely to provide a substantial portion of our energy needs in the foreseeable future, energy conservation is increasingly important as a way to reduce the adverse outcomes of fossil fuel consumption. Energy conservation may also provide a quick and efficient way to reduce overall energy costs for businesses and individual homeowners and renters.

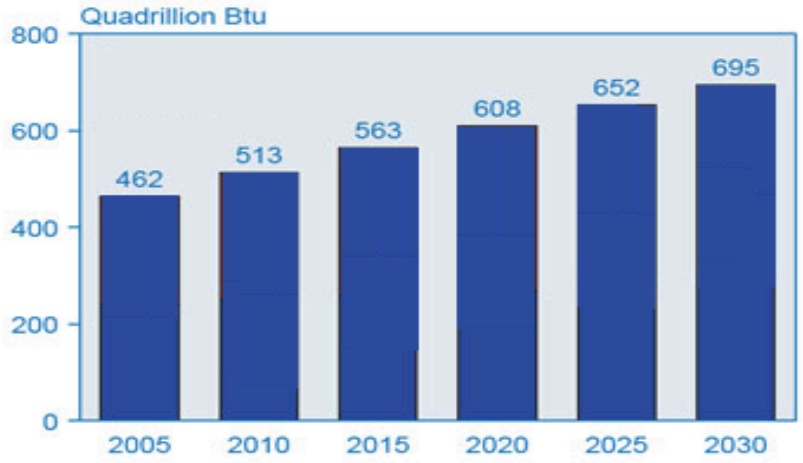
2.2 Energy Conservation Strategies

There are many ways that a homeowner can conserve energy in their residence. By making both physical and behavioral changes, residents can save a considerable amount of energy. These energy saving strategies are addressed in the following sub-sections.

2.2.1 Addressing the Problem

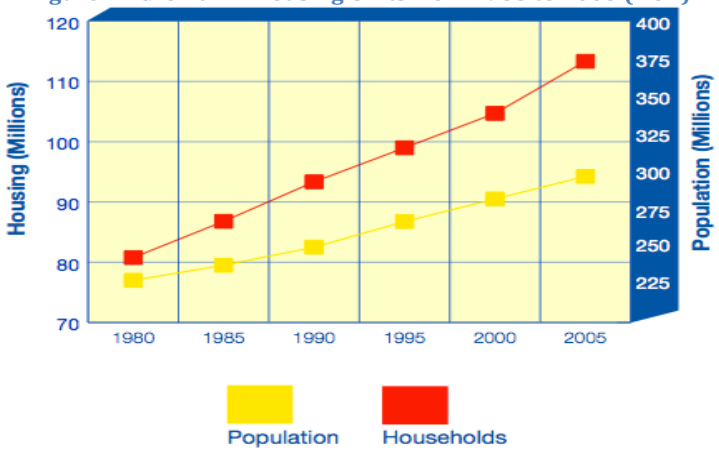
Energy consumption is projected to continue to increase at a steady pace, which can be seen in Figure 3. Some of the main contributing factors to the increase in energy consumption are increase in household size, house size and use of energy dependent products and appliances.

Figure 3 - World Marketed Energy Consumption, 2005-2030 (EIA, International Energy Annual 2005)



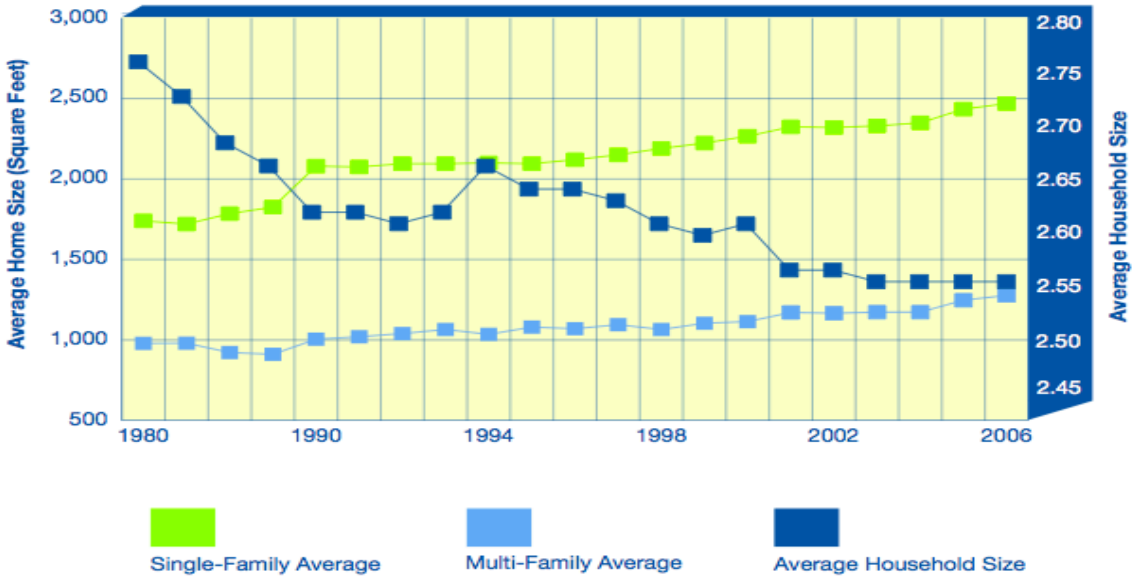
Currently, there is a disproportional increase of the number of households in comparison to the increase in population, which can be seen in Figure 4.

Figure 4 - Growth in Housing Units from 1985 to 2005 (DOE)



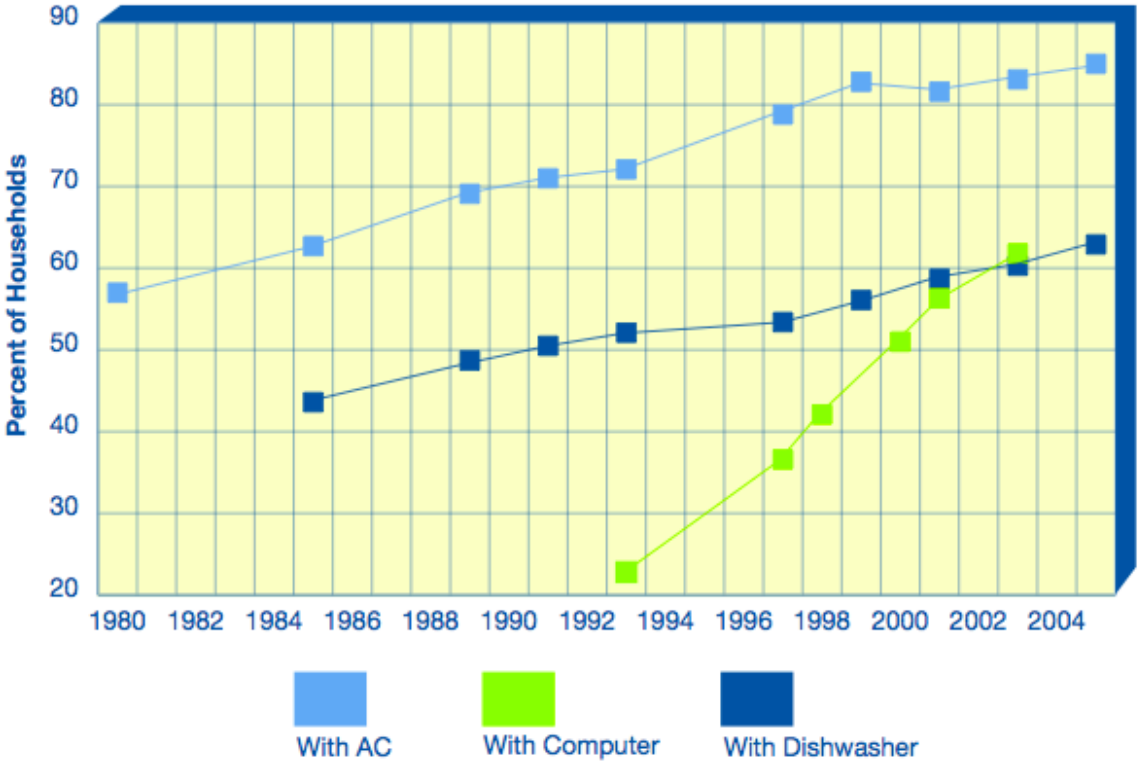
From 1980 to 2005, the number of U.S. households increased by 40%, population increased by 30% and more individual households used more energy, even with fewer occupants per home. Figure 5 shows that the average household size (dark blue line) has significantly decreased but the average house size of both single and multi-family homes (light blue and green) are increasing. Despite three economic recessions during this period, there was still a lot of economic activity. Some attributing factors to fewer people using more space could be more split households, higher incomes and smaller family sizes (Department of Energy, 2008).

Figure 5 - Average Size of New Homes and Average Number of People per Home from 1980 to 2006 (DOE)



Within the United States, increasing energy consumption is related to an increased number of houses that are greater than the population growth, increase in house size that increases HVAC needs and increased use of appliances; all can be seen in Figure 6.

Figure 6 - Market Saturation for Residential Equipment and Appliances from 1980 to 2005 (DOE)



Energy conservation practices can significantly reduce energy consumption and typically involve physical changes (such as the installation of insulation) and the use of technologies (such as electronic thermostats and more energy efficient appliances) or encouraging behavioral changes (such as turning off lights when not in use). Some of these changes are described below.

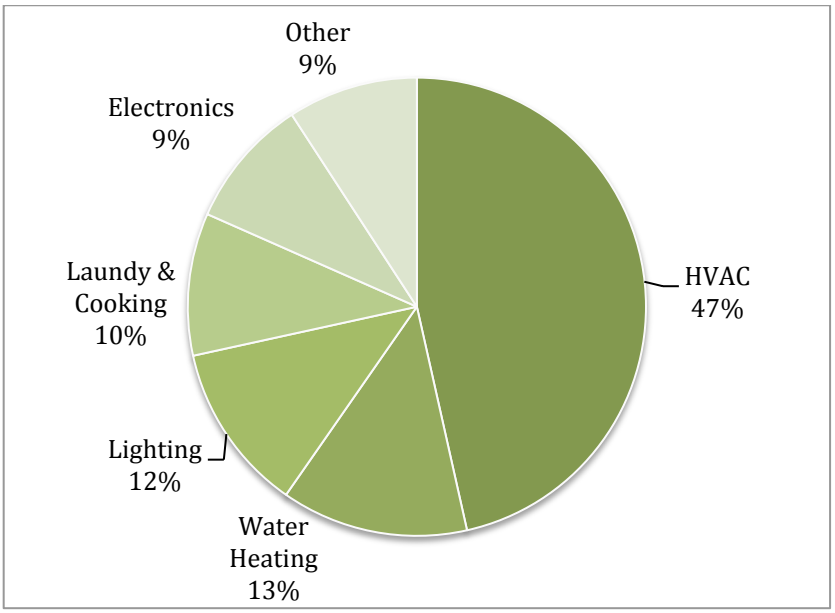
2.2.2 Decreasing Energy Usage with Technology

One approach to reducing energy consumption is to update to newer technologies in homes. By installing newer appliances and technology with increased efficiency, homeowners can enhance their lifestyles while using less energy and saving money. These are easy changes that provide immediate energy

reduction with minimal effort on the part of the homeowner. All of these examples are physical changes that a homeowner can make within their residence.

Based on studies done by the Energy Information Administration (EIA), the largest use of energy in a residential building in Massachusetts is on Heating, Ventilation and Air Conditioning (HVAC). In Figure 7, it can be seen that over 47% of residential energy is being used for HVAC ("Energy efficiency trends," 2008).

Figure 7 - Residential Energy Usage, 2008 (adapted from Department of Energy. "Energy Efficiency Trends")



While the climate in Massachusetts can vary between hot and cold extremes, installing programmable thermostats can help cut back on unnecessary HVAC usage. Programmable thermostats allow a homeowner to conserve energy by adjusting the home temperature higher or lower depending on the season or during periods of the day when absent or sleeping. By making this simple adjustment, the average home can save around $150 a year (Mass Save, 2012a). Once programmed, the thermostat requires very minimal maintenance, which makes it easier for homeowners to manage.

Energy Star estimates that up to seventy five percent of energy used by electronics, like computers, cell phones and televisions, is used when the device is turned off (Energy Star, 2012). A laptop computer that is plugged in and left in sleep mode overnight will consume 15.77 Watts or approximately 138 kWh per year. An average inkjet printer that is plugged in and left off will consume 1.26 Watts or

11.04 kWh per year. At the average cost of energy in Massachusetts, a sleeping laptop will cost $19.32 per year and an inkjet printer will cost $1.55 per year (Meier, 2012). While these individual amounts may seem small, most modern houses have multiple devices and the amount of money and energy wasted can be considerable. The energy used to power these devices is referred to as “standby power”, “vampire power” or “phantom load” and can account for five to ten percent of the average home energy consumption (Meier, 2012). This amount, in the year 2010 would equate to $80 to $160 per year.

To prevent excessive “standby power” losses, advanced power strips can easily be installed. Rather than plugging electronics directly into a home’s outlets, they can be plugged in to a power strip, which can easily be powered off at night or when the electronics are not charging or being used. Regular power strips would still require action by the homeowner to turn off the power strip every night, or whenever the electronics are not in use. Unfortunately, many people do not remember to do this on a regular basis and this is why manufacturers are creating products that will eliminate the necessity for human actions to impact energy conservation. For example, certain power strips can be set on a timer to automatically shut off during a certain time period or when a device remains inactive after a certain amount of time. Products that only require installation without monitoring are more attractive to potential customers because there is less work involved in the process of conserving energy.

Lighting accounts for twelve percent of the average residential home energy usage in the United States according to the Department of Energy ("Energy efficiency trends," 2008). Many households are still using incandescent light bulbs that use seventy five percent more energy to produce the same amount of light as a more energy efficient compact fluorescent light bulb (Mass Save, 2012a). So, by changing the incandescent bulbs in a home to compact fluorescents a homeowner can save up to $50 over the lifetime of the bulb. Compact fluorescent bulbs also last ten times longer than incandescent bulbs and will only need to be changed every five to seven years (Mass Save, 2012a).

2.2.3 Strategies for Promoting Energy Conscious Behavior

In 2005, Abrahamse, Steg, Velk and Rothengatter reviewed 38 different intervention studies and assessed what approaches were most effective at encouraging energy conservation behaviors. Different strategies were assessed including making commitments, goal setting, giving feedback and receiving information. The studies found that programs that offered regular feedback were more likely to be successful than programs that did not. In one study, homeowners were given different energy reduction goals (20% vs. 2% energy reduction) and some participants in each group were given feedback. The group that received the more difficult goal (20% reduction) and feedback on their success were able to reduce their electricity use by 15.1%. This was the only group that showed statistically different outcomes compared with the control group (Becker, 1978). This study highlights the need to set ambitious targets and give feedback. If a goal is set too low, it will not have as much of an impact and may be perceived as being not worth the effort.

In-Home Displays (IHDs) are digital displays that show utility usage in real-time, allowing a homeowner to monitor their energy usage in both units of energy and dollar amounts. In 2007, National Grid, NSTAR and Western Massachusetts Electric Company conducted studies evaluating the cost and benefit of IHDs for residential households in Massachusetts. A total of 3512 PowerCost Monitors (PCMs), a type of IHD, were distributed to customers with price points ranging from free to $49.99. The objective of this study was to examine consumer opinion of the PCMs and perceived savings. Almost 50% of the surveyed customers perceived a bill savings of 5 to 10%, while the actual savings may not equate to 5 to 10% due to varying energy costs over the study period (Faruqui, Sergici, Sharif, 2009). Not only did the study reveal actual energy savings but it also revealed behavioral changes due to the constant feedback that customers were receiving. Of the customers surveyed, 63% indicated they had changed their energy-usage behaviors after using the PCM with 41% turning off lights more often, 23% turning off the television and 18% turning off computers while they were not in use. Among those who reported

behavioral modifications, 60% indicated that they had noticed a decrease in their electricity bill (Faruqui, Sergici, Sharif, 2009).

State and federal agencies in the United States have developed numerous programs to educate and inform communities about energy conservation and several of these programs have been evaluated. For example, Geller looked at a program that held a community workshop on home energy conservation. The purpose of this study was to decide if a single 3-hour workshop would have any behavioral impact on participants (Geller, 1981). Geller concluded that, "workshops, informational pamphlets, and media promotion should not be relied on [to change behavior], unless they are supplemental [to other activities]." Significant reduction of energy consumption occurred when informational programs had additional monetary rebates and some amount of feedback (Geller, 1981). Overall, the ability to monitor and receive feedback is shown to be a useful technique to help promote energy conservation and promote energy conscious behavior.

2.3 The Mass Save Program

Our project focuses on the Mass Save energy conservation program. The Mass Save program is a no-cost Home Energy Assessment program available to customers of participating gas and electricity utility companies in Massachusetts. During the assessment, an auditor will come to the homeowner's residence and assess the energy efficiency of the home. The utility benefits from the energy savings by reducing the likelihood of blackouts or brownouts and the customer benefits by saving on their energy bill. The program has many incentives and offers for homeowners to improve their home energy conservation.

2.3.1 History

The Mass Save program is an energy conservation program that was started by eight electric and gas utility companies in Massachusetts. One of the utility companies involved in the program is National Grid, which currently provides electricity to Nantucket. The program strives to provide a wide range of services, incentives, training and information promoting energy efficiency that helps residents and businesses manage energy usage, enhance the value and comfort of

their homes and businesses and reduce greenhouse gas emissions. (Mass Save, 2012b). All of the services within the program are provided at no cost to residents, although the program is funded by a small surcharge on the monthly bills of all the residential customers of the participating utility companies. National Grid customers pay $0.00822 per kWh for energy efficiency programs offered through the utility and with the average home in Massachusetts using 3266 kWH in 2010, amounting to $26.85 paid by customers for programs like Mass Save (U.S. Department of Energy, 2012).

It would seem counterintuitive to think that gas and electric companies would want their customers to reduce their energy usage considering these companies make money from the amount of energy their customers use. However, utility usage can vary significantly throughout the year and even throughout the day so it can be difficult for the utilities to cope with this demand. If these companies then increase their infrastructure to handle the peak demand they experience, they do not gain any return on their investment when the usage is not at that peak. Given the unique situation of Nantucket, increasing this infrastructure to keep up with the islands' increasing demands could require the addition of a third submarine power cable that could cost upwards of $50 million. In order to pay for this, National Grid would reflect the cost of the cable in the already high price of electricity for residents. This cable would only be necessary during the summer season when the need for electricity peaks beyond the capabilities of the two existing cables. Since electricity usage outside of the summer months is low enough for the two existing cables to handle, the need for a third submarine cable diminishes. In this situation, National Grid can make more money by helping their customers to decrease their electricity usage than if their customers consumed more energy.

2.3.2 Home Energy Assessments

One of the main services offered to homeowners by the Mass Save Program, is a Home Energy Assessment (HEA). An HEA is an assessment during which a Mass Save energy specialist visits homes to assess their current energy usage and provides a custom list of energy saving recommendations to the homeowner. The assessment of the home, usually lasting 1.5 to 2.5 hours, checks the homes thermal

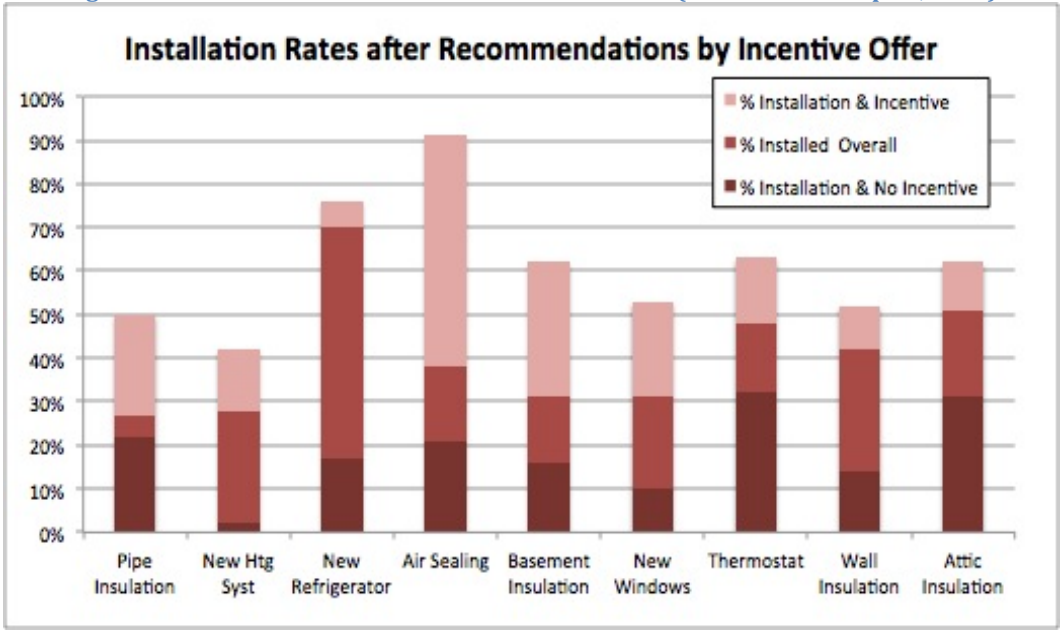
layer, mechanical systems and appliances. (Mass Save, 2012). The thermal layer of the house refers to the walls, insulation and tightness of doors and windows. The energy specialist will check the insulation between conditioned and non-conditioned rooms, seal up some small holes in the attic and assess the condition of that separation, if necessary. The mechanical systems refer to the water heater and plumbing, with general recommendation for these systems including pipe insulation, low flow showerheads, thermostats and high efficiency systems (Mass Save, 2012c). The final part of the assessment reviews appliances and lighting as these areas account for a large amount of energy usage in a home. Typically the contractors will install compact fluorescent light bulbs to replace incandescent bulbs present in the home and a programmable thermostat to regulate heating and cooling. A common recommendation from contractors is to replace outdated appliances with newer, more efficient Energy Star certified appliances that can save 20-30% on energy consumption (Mass Save, 2012c). After doing the walk through assessment and reviewing the current utility usages, the contractor gives the homeowner an energy plan or 'road map' of ways they can conserve energy and make their home more efficient. The energy specialist also explains various rebates and incentives that can help lower the cost of more efficient appliances and weatherization of their home.

2.3.3 Physical and Behavioral Changes

The HEA mostly addresses physical changes that a homeowner could implement, rather than the promotion of behavioral changes per se, which are considered beyond the remit of the auditor. Although newer technologies, like programmable thermostats and advanced power strips, are designed to limit the extent of behavioral changes necessary, behavior changes remain an important element of energy conservation. For example, people may still need to remember to turn off lights even if they are newer CFLs. If the auditor leaves a digital thermostat with the homeowner, he or she still has to install the device and program it for use. As noted previously, changing homeowner behavior typically requires more than a single educational workshop and is substantially altered with appropriate incentives and feedback.

In 2005, Nexus Market Research, Inc. did a survey evaluation on the Mass Save program (Nexus Market Research, 2005a) surveying 900 homeowners who had participated in a HEA. A specific part of the survey asked participants about what recommendations they recalled receiving from the energy assessment contractor and which ones, if any, they implemented. The results are displayed in Figure 8.

Figure 8 - Recommendation Recall and Incentive Offers (Nexus Market Report, 2005)



Not surprisingly, homeowners were least likely to install a new heating system, with or without any additional incentives, which reflects the capital cost of such a measure. The figure also shows the percentage of homeowners who implement a recommendation after receiving an incentive versus those who do not receive the incentive. The significant difference between the installation percentages highlights the attractiveness of incentives in the Mass Save program. This study also shows that when recommendations for new refrigerators were given to homeowners, 70% of these homeowners installed a new refrigerator. Incentives, like rebates, are an effective way to promote energy efficiency (Nexus Market Research, 2005a).

2.4 Marketing the Mass Save Program

In 2005 Nexus Marketing Research conducted two evaluations of the Mass Save Program and its marketing effectiveness, with one geared towards homeowners who had an assessment and one for the general population. The General Population Survey provides findings from a study of 779 randomly selected Massachusetts residents, 668 of which were considered a target population for participation in the Mass Save program. Targeted participants either owned their own homes or paid for their own heat and electricity. The survey was designed to measure factors such as recognition of the program, where residents heard about the program, understanding and valuing the program offerings and likelihood of installing measures suggested in the assessment. Alternatively, the Nexus Mass Save Participant Survey reviewed 900 homeowners who had recently had HEA's in the first six months of 2005 and were surveyed from October to November. The survey was designed to measure why recommended energy saving methods were not installed, the influence of the written report on installation of major measures, the appropriateness of current incentives, program recognition and where the participants had heard of the program.

2.4.1 Awareness and Interest in the Mass Save Program

While two-thirds of the 668-targeted respondents in the general population study had heard of a program that provided in-home energy assessments, only 32% of them had actually received an audit at some point in their current residence (Nexus, 2005b). When prompted, approximately 30% of targeted responders had heard of the Mass Save program, up from 4% that could identify the program when it was known as the Massachusetts Home Energy Services in 2004 (Nexus, 2005b). However, when unprompted, only 5% of the target respondents who were aware of HEA programs named the Mass Save program specifically (Nexus, 2005b).

Similarly, only 11% of the 900 respondents to the participant survey named Mass Save as a program that provided HEA's when unprompted, up from 6% in 2004 (Nexus 2005b). Bill inserts were the most successful mode of advertisement, with 47% of participants learning about the program in this way. Other modes

include word of mouth (19%), homeowner-initiating inquiries to the utility company (8%) and retail or contractor recommendation (3%), (Nexus 2005b).

These data show that while public awareness is growing, getting people to commit to having an HEA is difficult. Of 444 respondents in the general population survey, 56% said they would not want to have a home energy assessment, with the most common reasons for disinterest being "home is already energy efficient" (31%), "not interested in installing measures" (17%) and "have already installed most measures" (12%). As shown by these data, many Massachusetts residents believe that they do not have much to gain from an assessment and believe that the measures that they have already taken are sufficient. As a lack of useful information was the number one deterrent for the Mass Save program, it is important that the program is constantly educating the community on the values of energy conservation, providing up-to-date products and finding ways to successfully implement energy conscious behavior.

2.4.2 Expectations and Satisfaction with the Mass Save Program

The Nexus Participant Survey found that the most common expectations of the Mass Save program are how to save energy (44%), how to lower energy bills (38%) and how to make homes more comfortable (23%). When marketing the Mass Save program, it would be beneficial to highlight the aspects of the program that achieve these expectations, as many in the general population believe that the Mass Save program will not provide them with additional benefits (See Section 3.1 of this literature review).

The Nexus Participant Survey asked homeowners to rate their satisfaction with the Mass Save program on a scale of 1 to 10 (with 1 being not satisfied at all and 10 being extremely satisfied) in six different areas: usefulness of the report, satisfaction with energy savings, satisfaction with learning from the program, quality of information, satisfaction with recommendations and overall satisfaction. Of the 900 participants, 76% responded with very or extremely satisfied scores from an 8 to a 10. Additionally 61% said that the assessment report that they received influenced what measures they ultimately installed, demonstrating that the

Mass Save assessments are leading to actual changes and installation of more energy efficient devices (Nexus, 2005a).

2.4.3 Incentives

One of the most popular selling points for the Mass Save program is the incentives it provides to homeowners who participate in the program. In its survey to the general population, Nexus found that 54% of the 779 respondents would be interested in having a home energy assessment if rebates were available to them. In comparison, only 37% of respondents showed interest in an assessment without mention of a rebate or incentive and only 39% interest in an assessment with prospect of an interest-free loan rather a rebate. It is evident that rebates are an effective tool that the Mass Save program provides to attract homeowners to the program.

2.4.4 Conclusion

Based on the experience of many years of conservation efforts, the Mass Save program offers a variety of incentives to homeowners to conserve energy. Initially the Mass Save program was not easily accessible to homeowners on Nantucket because of travel difficulties and the high costs of staying on the island for the auditors. For example, in 2011, several Nantucket residents claimed when calling Mass Save for an energy assessment, they were told by the call center that Nantucket was not a Mass Save serviced territory. Also, during the calendar year of 2011, Mass Save only visited Nantucket once, servicing just 32 homes. In order to have the program available to the residents of Nantucket on a more regular basis, Lauren Sinatra, the Nantucket Energy Project & Outreach Coordinator, organized an arrangement with National Grid to schedule audits during one week per quarter to make sure that National Grid maximizes the time and money used to conduct audits on the island.

Presently, homeowners on Nantucket can sign up for an audit either through Lauren Sinatra at the Nantucket Energy Office or through Conservations Services Group (CSG), National Grid's lead vendor for providing energy assessment services. While Ms. Sinatra can collect information to sign up residents, the actual audit

scheduling is done by CSG.

Having conducted over 175 audits to date, the Energy Office would now like to evaluate the program and determine ways to increase interest in the program. Our project will focus on evaluating the marketing and logistics of the program and determining factors that are preventing sign up and implementation of energy saving measures using methods described in the following chapter.

3. Methodology

The goal of this project was to evaluate the Mass Save Program on Nantucket and recommend improvements to the current execution and implementation strategy that would increase energy conservation and program awareness on the island. To accomplish our overall goal, the team developed four main objectives: 1) Identify lessons learned from the organization and evaluation of past energy conservation programs; 2) Evaluate the implementation of the Mass Save Program on Nantucket; 3) Evaluate the current marketing and outreach efforts currently in place on Nantucket; and, 4) Recommend improvements that can be made to the Mass Save Program as it is implemented on Nantucket. In addition to basic background research on energy conservation techniques and programs, the project team conducted interviews with key officials, surveyed homeowners who had received Home Energy Assessments (HEAs) through the Mass Save program, surveyed the general population to gauge public awareness of the program and analyzed the marketing materials and strategies of the program.

3.1 Objective 1: Identify Successful Approaches from Past Energy Conservation Programs.

Our team conducted an extensive review of the literature on past energy conservation programs. The Literature Review (see previous chapter) examines the marketing and outreach tools as well as actual energy conservation strategies these programs used. Looking at their methods to determine successful evaluation practices helped our team to develop evaluation techniques for the Mass Save program. Supplemental information was added throughout the data collection and analysis processes while our group surveyed on Nantucket.

3.2 Objective 2: Evaluate the implementation of the Mass Save program on Nantucket.

To evaluate the different aspects of the Mass Save program, our group interviewed key stakeholders involved in the program and surveyed homeowners who had participated in the program.

3.2.1 Interview key Stakeholders in the Mass Save Program

Our team conducted interviews with key stakeholders in the Mass Save program to determine their opinions, experience, and insight about the program. One of the most important individuals we interviewed was Lauren Sinatra. Ms. Sinatra is the Energy Coordinator for the Town of Nantucket Energy Office and has an integral understanding of the Mass Save program and it's functioning, specifically with respect to the island.

Through Ms. Sinatra, our team was able to interview Robert Eckel, New England Regional Vice President of Conservation Service Groups (CSG), Bill Julio, Senior Project Manager for CSG and Monica Tawfik, Program Manager for National Grid's Home Energy Services program. Mr. Eckel, and Mr. Julio explained the sign up process, logistics of assessments, follow-up procedures, restrictions that limit what CSG can change in the program, and the goals and ideas for the future of the program. Ms. Tawfik was able to provide more information about the products provided during an assessment, as well as more details about the follow up procedures Mass Save employs.

During the November Audit Week, our group was able to shadow the auditors on two home energy assessments. Both of the shadows allowed the team to speak in-depth with the auditors about the program, and explore a range of issues from common things that they see in Nantucket households to typical recommendations they make on houses. These interviews have given us insight on the program's establishment, presence and success thus far on Nantucket. Any opinions and observations made by these sources are their own intellectual property. Therefore, for all of the interviews we began each meeting with a statement of consent to perform the interview and ask for permission to be able to quote the individual or use their information in our final report. If our group chooses to quote individuals directly, we will give each individual the opportunity to review their quotations and approve them before we submit a final paper. Any quotations not approved by the individual will not be included in our final paper or any marketing materials.

3.2.2 Survey of homeowners who have received a Home Energy Assessment

In order to assess the effectiveness of the Mass Save program, our team surveyed homeowners who have received a Home Energy Assessment (HEA). We developed an initial survey for homeowners who had had an assessment (see Appendix A) based on discussions with staff in the Nantucket Energy Office, findings from the literature review and examples of other post-audit surveys such as those conducted by Nexus. The survey instrument was designed to elicit information regarding marketing strategies, overall impact, program satisfaction and recommendations given during the audit. The survey was pre-tested with twelve WPI faculty members who had received a home energy assessment. The survey was administered with a group member posing a question to the respondent and leaving it open ended for them to answer. The purpose of the pre-test was to help solidify the order, suitability and clarity of each question to make sure the surveys included desired information in a quantifiable manner. The pre-test showed us that there were a variety of reasons for why homeowners choose to have audits so we adjusted and increased response options for pertinent questions. The increase in the number of response options allowed for greater ease when surveying and greater record of response detail, allowing group members to check something off rather than spending time writing it out.

Initially, our group created three separate surveys, one survey for homeowners who had participated in the program in the past, two for homeowners who participated in the audit week during our stay on Nantucket; the first survey was to be administered prior to having an assessment and the second was to be administered following the assessment. The pre- and post-audit surveys would allow for a more accurate measure of homeowner expectations going into the assessment, how well those expectations were met afterwards and what residents gained from their assessments. Once on island, we reviewed our survey and results with our sponsor and advisor and determined that we needed to combine the pre- and post-audit surveys into one survey to maximize the time we would have with each homeowner. As a result, we drew up one survey with two variations based on

when the homeowner had received an audit: one for homeowners who had an audit prior to November 2012 (Appendix B) and one for homeowners who had an audit during the November 2012 audit week (Appendix C).

The survey for homeowners who had an audit prior to November 2012 contained supplementary questions regarding implementation of recommendations, impacts on electricity bill and behavioral changes. Our team modified the surveys for the November 2012 audit week participants as they had a short amount of time between their audits and our interviews with them. As a result, we removed post-audit questions geared towards recommendation implementation, perceived energy savings and program incentives used as it was too soon for homeowners to accurately answer these questions.

As stated in the literature review, there are two ways for homeowners to sign up for an assessment: contact Mass Save directly or contact Lauren Sinatra at the Nantucket Energy Office. There had been two audit weeks, prior to our arrival in October, the first in January and the later in April. Ms. Sinatra obtained permission from National Grid for our group to have access to the contact information of consenting homeowners receiving an assessment during the November 2012 audit week to assist with our project. However, we were unable to receive that same information for homeowners who received their assessments in January or April and signed up through National Grid due to confidentiality concerns. As a result, our team was only able to access contact information for residents who had signed up through the NEO for those two audit weeks. Ms. Sinatra organizes the audits on the island and maintains a record of participants who had signed up for energy assessments through her office. Ms. Sinatra contacted the HEA participants that had signed up through her office and requested permission for our group to contact them for a survey prior to our arrival on Nantucket. Based on this list, our group was able to contact 16 participants from the January and April audit weeks for interviews.

Homeowners were given the option of either an in-home interview or a phone interview. If the homeowner opted for an in-person interview, two team members would travel to the homeowner's residence, with one team member

conducting the interview and tracking responses while the other took notes for backup information. If the homeowner preferred a phone interview, one member of the group would call the resident and document the their responses on a printed survey.

Initially, our team planned to ask homeowners for permission to see their energy bills and audit reports but due to the numerous variables that can affect energy usage, we decided that we would not be able to draw quantifiable from this information. If a homeowner missed an interview or was unavailable, a team member called back to arrange another visit or phone interview.

Survey responses were kept confidential unless the respondent allowed us to quote them, in which case we provided them with the quoted material prior to publication for approval. Otherwise, summary statistics and graphs will represent data in an aggregate, anonymous form. Our group expected to solicit complete surveys from approximately 50 respondents out of 120 from January and April audit week and about 25 out of 50 from the November Audit week. Through the duration of this project, our group obtained 16 January and April surveys and 33 November surveys. This was due to limited contact information for homeowners who received their assessment in January and April based on the different sign up procedures. We were given a complete list of contact information for participants in the November 2012 audit week.

Once collected, survey responses were entered into Microsoft Excel spreadsheet and coded. A number was assigned to a specific response for questions that could be categorized. For example, the question, 'do you rent or own your place of residence?' residents who own were coded with the ID of 1 and those who rented were coded as 2. Coding the surveys created data that could then be analyzed more easily using the statistical applications in Microsoft Excel. The responses to open-ended questions were entered into the spreadsheet verbatim to consolidate all of the answers in one place and then coded in a similar fashion based on similar answer categories. The data were summarized using statistics, graphs and charts to show overall trends in responses. From this information our group determined areas of improvement in audit implementation and outreach. Participants'

testimonials and summary statistics may be used in marketing materials to help relay the benefits and customer satisfaction with approval from participants after their review of the materials.

3.3 Objective 3: Evaluate the current marketing and outreach efforts of the program.

The evaluation of the marketing program and outreach efforts was made through interviews with key individuals involved in the program and a survey of the general population to assess the public awareness effective outreach methods.

3.3.1 Determine Public Awareness of the Mass Save Program on Nantucket

In addition to interviewing homeowners who have participated in the audit program, our group surveyed a sample of the general public to characterize general awareness of the Mass Save program on the island. To do this we developed a brief survey (Appendix D) to be administered either in-person or through an online survey. A pilot test of the survey was conducted to enhance clarity of the questions and response categories. The survey was designed to collect information from Nantucket residents, so interviews took place at venues that are frequented by residents such as the local grocery store and the ferry docks. The survey included a brief preamble explaining the nature and purpose of the survey and identifying that the survey was anonymous. Initially our team planned to only administer in-person surveys but found that the weather and off-season population made it difficult to achieve the sample size that we desired. Therefore, we created an identical supplemental online version of the survey that was distributed electronically through local organizations' newsletters and posted on the Nantucket Energy Office website and our group's project webpage. In total we collected 97 surveys: 33 online, 27 from Rotary Club Meeting, 22 outside of Stop & Shop, 13 from downtown and 2 at a Board of Selectman Meeting.

Our team was able to discover additional avenues of distribution for our general population survey through an interview with Janet Schulte, Executive Director of the Maria Mitchell Association. Through her recommendation, our group

obtained a list of local organizations to send the online version of the survey through, including Nantucket Homeowners' Associations, the Nantucket Conservation Foundation and the Nantucket Land Council. Additionally, our group was interviewed by Sandy Walsh on the local radio station, 97.7 ACK FM. We found that the addition of an online version of our general population survey was very successful and brought in an additional 33 responses that we may have otherwise missed. This information was analyzed to determine the overall awareness on the island, which helped our group to identify areas of the marketing plan that could be improved upon and to make recommendations on how to reach the more residents.

3.3.2 Media and Advertising

Based on the analysis of the homeowner and general population survey data, we determined common ways that residents learn about programs in the community and how they discovered the Mass Save Program. The team compared the responses to the marketing techniques used by the Nantucket Energy Office at the time to promote the Mass Save Program. Additionally, the Nantucket Energy Office was able to use research in our literature review to identify successful marketing and outreach strategies for use in the future. Given the size of Nantucket, factors like population, demographics and politics will play a role in the success of a marketing strategy and will need to be taken into consideration when choosing which method the Energy Office chooses to use.

In addition to an examination of the program's marketing strategies as a whole, we focused on the advertising for the audit week in the first week of November. We observed the marketing techniques employed to promote audit week to facilitate available time slots for audit week as well as promote an educational demonstration meant to provide a walk through of an actual home energy assessment. This demonstration would have allowed local residents to observe an audit, ask questions to auditors and representatives of the Mass Save Program but also served as a marketing event for the Mass Save audit week to generate awareness. Unfortunately, this demonstration was cancelled due to inclement weather conditions but will be offered during the next audit week in early March. Ms. Sinatra's marketing campaign for the Mass Save program and HEA

demonstration included hanging posters around town on bulletin boards, at the ferry docks and in local shops, newspaper advertisements and a radio interview on a popular Nantucket radio program. Additionally the newsletters sent out to organization mailing lists including our public awareness survey contained additional information about the program and avenues for residents to sign up for the program.

3.4 Objective 4: Recommendations

After analyzing the results from our surveys and the information gathered about similar energy assessment programs, we provided recommendations to the Nantucket Energy Office, Conservation Services Group and National Grid to improve the Mass Save program that can be found in the following section of this report. These recommendations focus on improving the marketing of the Mass Save on Nantucket, logistics of the HEAs and follow up activities that encourage greater homeowner participation. The results of the general population survey provided insight into the best ways to inform residents of the Mass Save program and key attributes of the program that can be highlighted to attract target audiences. Issues discussed during interviews emphasized areas of the assessments that can be improved, including time management and follow up. For continuing improvement of the program beyond this study, the surveys developed in the Appendices B, C and D can be used by the Nantucket Energy Office for further data collection.

4. Findings

By applying our methodology, as outlined in the previous section of this report, we were able to identify how marketing, outreach and other aspects of the Mass Save program on Nantucket could be improved. First, we identified the key areas of development in the implementation of the Mass Save program on Nantucket through interviews with key stakeholders involved in bringing the program to the island. To assess the effectiveness of levels of satisfaction with the program itself, we interviewed homeowners who had received Home Energy Assessments (HEAs). Based on the information we collected, we were able to identify areas of the Mass Save program on Nantucket that could be better tailored to meet Nantucket's unique situation as an island with many seasonal residents and historic homes with strict preservation guidelines. Finally, we surveyed the general population to determine public awareness and perceptions of the program. Thus, we were able to identify marketing strategies that might help the Town of Nantucket Energy Office reach more residents and increase participation in the program.

4.1 Interviews with Key Individuals

Our team interviewed members of both the Town of Nantucket Energy Office (NEO) and Conservation Services Group (CSG) to better understand how the Mass Save program operates. These interviews helped provide further context for how the program is currently managed, specifically on Nantucket. The NEO and CSG have collaborated to assign and promote designated audit weeks for home energy assessments (HEAs) to be conducted on a quarterly basis. National Gird has contracted CSG for the past twenty years to schedule and perform HEAs as part of the Mass Save program. The NEO is responsible for promoting energy efficiency and the Mass Save HEA program within the Nantucket community as well as facilitating the sign-up process for island residents and assisting local contractors to receive work, at fair Nantucket wages, under the Mass Save program.

4.1.1 Town of Nantucket Energy Office

From our interviews with Lauren Sinatra of the NEO, we gained insight into the day-to-day workings of the Mass Save program on Nantucket. According to Ms. Sinatra, the arrangement between the NEO, CSG and Mass Save a temporary one, intended to usher a permanent program for island residents.

The NEO markets audit weeks through multiple avenues including newspaper advertisements, fliers posted around the downtown area, Town website and Facebook announcements and radio interviews. Ms. Sinatra also inaugurated an educational HEA demonstration during the November 2012 audit week open to the public, to provide an opportunity for residents to ask questions to Mass Save employees and generate interest in the program. Unfortunately, this event was canceled due to inclement weather but will be rescheduled during the next audit week in early March. The amount of advertising and marketing that the NEO can do is limited, as it is not a publically funded office, and has no operating budget. Instead the office is funded by a grant that the Town of Nantucket applies for on an annual basis through a local philanthropic organization, ReMain Nantucket.

A major problem with scheduling HEAs on Nantucket, according to Ms. Sinatra, is the cost and logistical problems associated with sending auditors to Nantucket from the mainland for audit weeks. Originally, the audit weeks were created so that CSG could optimize the time spent on the island and perform as many HEAs in a week as possible. However, the NEO and CSG are working together towards certifying local contractors with Mass Save to conduct home HEAs and perform weatherization and insulation work for the program. By certifying local contractors, audits could occur throughout the year, making it easier for both fulltime and seasonal residents to schedule audits. This would also save National Grid the expense of sending auditors to and from the island. Instead, such funds could be passed along to locally based contractors working for the Mass Save program to supplement compensation and allow local contractors to earn a wage more consistent with the Nantucket labor market. Additionally, having local contractors certified to complete weatherization and insulation work would ensure

timelier contract work, and a drastically lessened lead-time between the audit and implementation steps.

4.1.2 CSG and National Grid Interview

Our team interviewed Bob Eckel, New England Regional Vice President of CSG and Monica Tawfik, Program Manager of Residential Energy Efficiency Department of National Grid. These individuals expressed that the Mass Save program on Nantucket was still a work in progress, with room for improvement. Following an assessment, CSG typically contacts homeowners by mail after an assessment to follow up and obtain feedback on their experience. Additionally, auditors on the mainland usually follow up with homeowners following their audit to answer questions or discuss contract work. However, these follow-ups have faltered on Nantucket.

4.1.3 Home Energy Assessments

Approximately 60 audits were performed during each of the three audit weeks during 2012, yielding a total of approximately 180 audits, representing 4.9% of Nantucket's 3,623 occupied households on Nantucket (U.S. Census, 2012). However, despite the fact that CSG and National Grid agreed to quarterly audit weeks, they have expressed reluctance to conduct audits during the busy summer months. This aversion is due to Nantucket's tourist-based economy which makes travel and lodging on the island during the peak summer season difficult and very costly. As a result, there was no audit week held in the summer of 2012, which unfortunately has prevented seasonal residents from taking advantage of the program.

Our team interviewed an auditor while shadowing an HEA who is normally responsible for three audits per day on the mainland, but must complete five per day while on Nantucket. With so many audits scheduled each day, auditors can sometimes have to rush to stay on schedule. During the November 2012 audit week, a strong storm hit the island, suspending ferry service to the island. Consequently, the third auditor, who was scheduled to arrive that day and start performing assessments, could not do so, forcing some audits to be rescheduled. In addition to

these cancelled audits, several residents and caretakers were forced to cancel their appointments due to the storm; this situation demonstrates how reliance on off-island auditors might hinder a smooth execution of assessments.

4.2 Mass Save Program Participants Survey

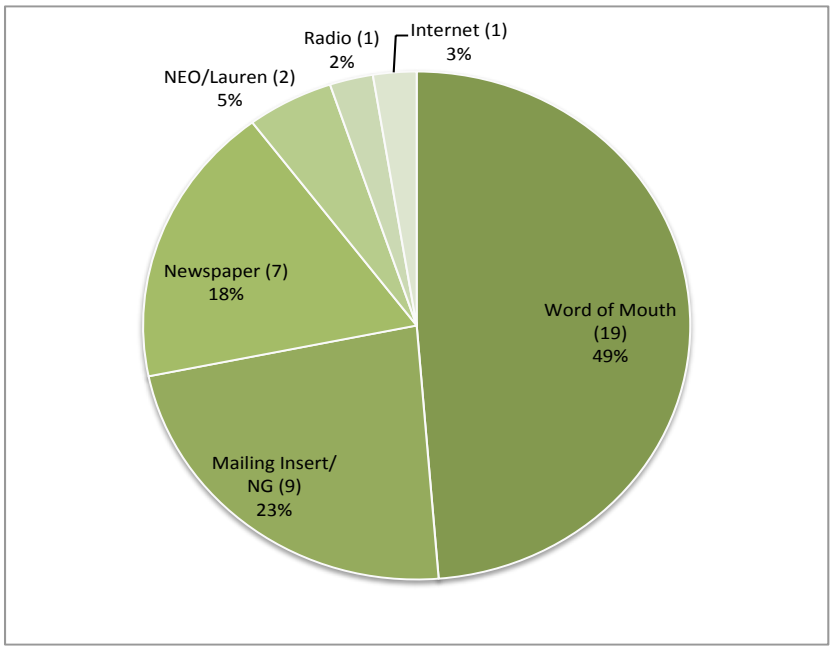
Overall, our team interviewed 39 homeowners who had participated in the Mass Save program between January 2012 and November of 2012 (roughly one-quarter of approximately 175 homeowners who had participated in the program). Although we aspired to survey half of these 175, this proved infeasible, due to the limited availability of contact information. We managed to interview 9 residents who participated in the January 2012 audit week, 7 residents who participated in the April 2012 audit week and 23 residents who participated during the most recent November 2012 audit week, for a total of 39 completed interviews, heavily skewed towards those assessments conducted most recently (See Appendix E for details).

Of the 39 participants, three rent their residence and 36 are homeowners. The houses in the sample ranged from 7 years old to nearly 260 years old, with an average of 37 years. Of the 39 homes, 33 (85%) use propane or oil for heating, four (10%) use electricity, one uses firewood and one uses solar panels. The geographic distribution of assessments based on data for the HEAs were performed in January 2012 and November 2012 is shown in Figure 9. The locations of the audits mirror the island-wide population distribution and highlight areas like Siasconset and Madaket on either ends of the island where few to no homes were assessed during either audit week.

Figure 9 - The location of residences of homeowners who have participated in an assessment, the blues are assessments completed in November 2012, reds are from January 2012.

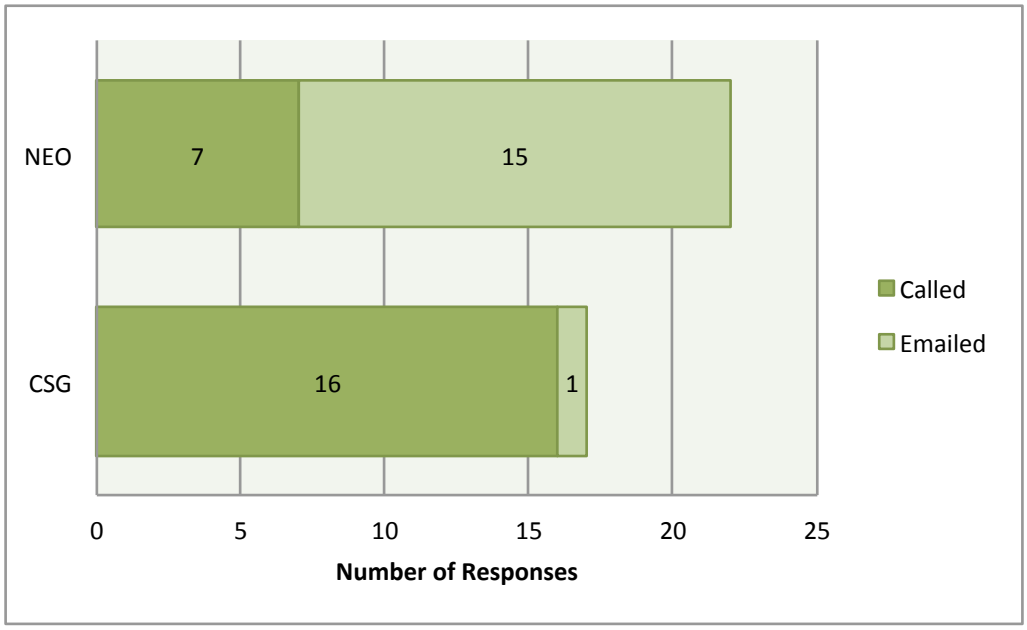
Participants in the Mass Save program were asked how they heard about the Mass Save program. As seen in Figure 10, almost half of the respondents (49%) heard about the program by word of mouth. Twenty-three percent heard about the program from mailing inserts, and 18% from newspaper advertisements. Only small fractions of participants had heard about the program through the NEO directly, radio or Internet.

Figure 10 – How did residents who received a home energy assessment learn about the Mass Save Program (N=39)



Presently, residents can sign up for an assessment by contacting either the Nantucket Energy Office or Mass Save/CSG by phone or email. Of the 39 surveyed, 22 contacted NEO and 17 contacted CSG. Most of those contacting NEO did so by email, while most of those contacting CSG did so by phone (see Figure 11).

Figure 11 - How residents signed up for an Assessment (N=39)



According to Ms. Sinatra, when CSG calls residents to schedule appointments, they should convey to residents basic audit procedures and to have past electricity bills ready at the time of the audits. However, our survey results revealed that participant expectations and preparedness varied widely; some developed questions for the auditor prior to having an audit while others did not furnish their past energy bills to the auditor. The variation in preparedness suggests that providing additional information in advance of the audit would be helpful. By providing an email or written document that outlines the audit procedure, necessary documents for the assessment and a list of products that may be provided during this assessment, homeowners will have a better idea of what to expect at the time of their assessment.

Owing to very high real estate values, many homeowners opt to rent out their property during the peak tourist season from June through August. Other

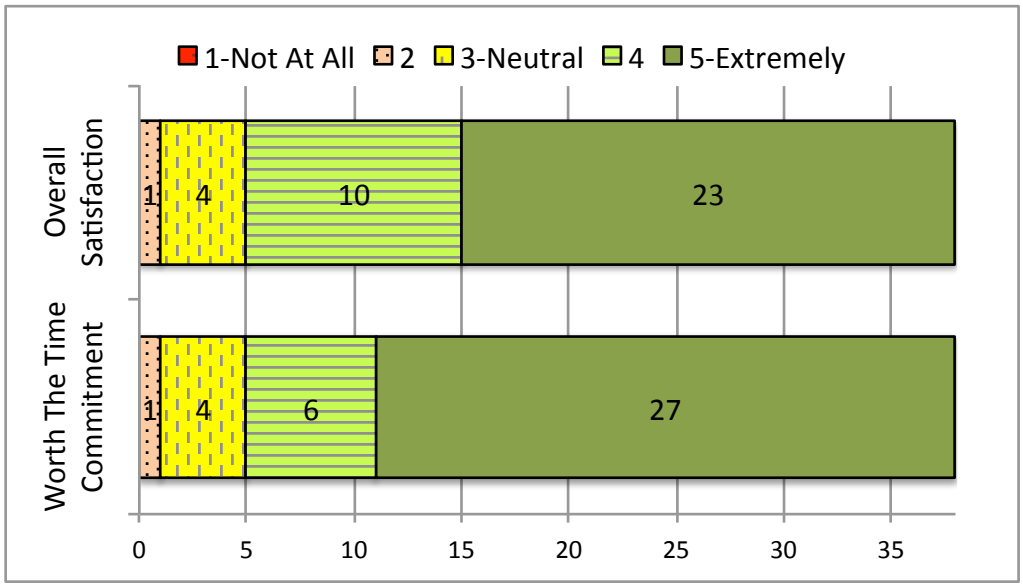
wealthy homeowners occupy their Nantucket homes for just short periods and prefer to leave them unoccupied for the rest of the year. In both cases, homeowners typically retain caretakers who look after the property. While shadowing an assessment, we were able to meet a caretaker who was present for the assessment in the owner's absence. While the caretaker had some knowledge of the home's layout and construction history, he was unsure of the heating system location and its connection to a storefront attached to the residence. The auditor had to call the homeowner multiple times to clarify the heating situation and address questions the caretaker could not answer. This particular residence was recently renovated and did not require any follow-up contract work for insulation or weatherization. Had the home required work, a contract for that work could not have been completed at the time of the audit, given the owner's absence. The prevalence of caretakers and seasonal residents on the island proves to be an impediment to the program implementation on Nantucket and prevents homeowners from gaining as much as possible from the assessment.

Renters who pay their own electricity bills have access to the Mass Save program as well. Because the renters do not own the residence, however, they cannot legally sign for any contract work to the residence, making the weatherization and insulation measures hard to implement unless the landlord is present and supports the audit recommendations. Additionally, since the tenant typically is responsible for paying the electric bill, the landlord is less incentivized to upgrade the energy efficiency of the property. One of the three renters interviewed intends to implement some of the auditor's recommendations (by making improvements in lieu of his rent); the other two renters were not going to implement any substantial recommendations since the payback period exceeds their anticipated stay in their residence. These kinds of problems associated with rental properties are not unique to Nantucket, but they point to the need for the program to reach out more flexibly and effectively to landlords and renters.

Beyond the informational questions, the survey asked several questions to gauge homeowner perceptions of and satisfaction with the program. As shown in Figure 12, 33 of 38 respondents (87%) said that they were satisfied or extremely

satisfied with the program for an average of 4.4 on a scale of 1 (not at all satisfied) to 5 (extremely satisfied). Similarly, Figure 12 shows that 33 of 38 respondents (87%) said that they thought the time spent was worthwhile or extremely worthwhile, an average rating of 4.5 on a scale of 1 to 5.

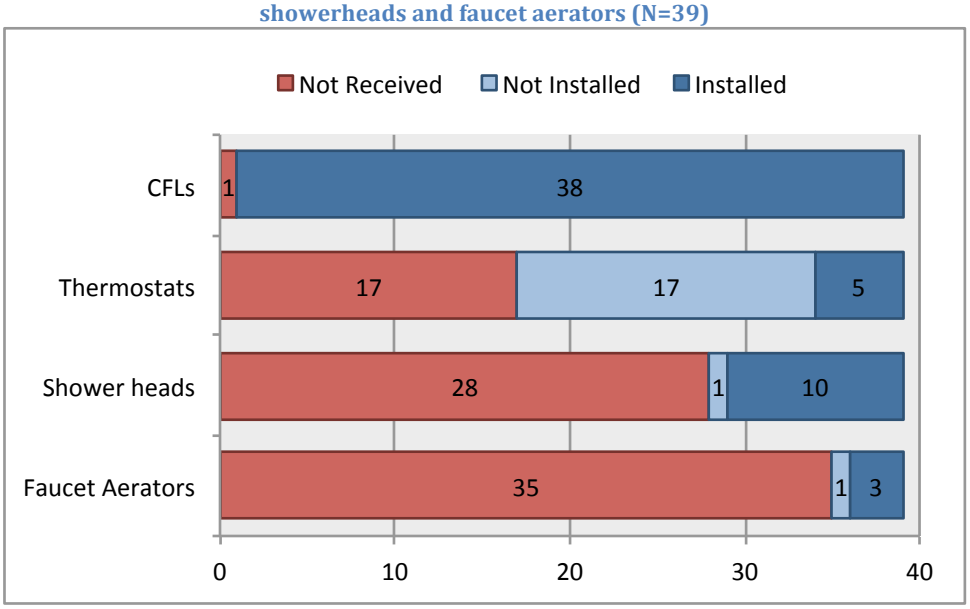
Figure 12 - Homeowners Overall Satisfaction and Perceived Worthwhileness Responses (N=38)



Generally, those who were satisfied thought the time commitment was worth it, although curiously a small number thought the assessment was worthwhile but rated their overall satisfaction as low. The Mass Save program on Nantucket offers four no-cost products to participants during their assessment (compact fluorescent light bulbs (CFLs), programmable thermostats, low-flow showerheads and faucet aerators). Whether or not a resident receives a product – and how many they receive – depends on the specific needs of the home (e.g., high or low voltage thermostat) but may also be influenced by other factors, such as the amount of time available to the auditor. Generally the auditor is supposed to install the products in order to ensure that the energy company immediately benefits from the energy savings rather than risk the possibility that installation will be delayed or forgone due to homeowner procrastination or forgetfulness.

Figure 13 shows the distribution of how many respondents received or did not receive each item and how many of the products were installed at the time of the audit.

Figure 13 - Homeowners receipt and installation of compact fluorescent lights, thermostats, showerheads and faucet aerators (N=39)



Compact fluorescent light bulbs were the most common product received and installed, with an average of 20 bulbs installed per home (an investment amounting to several hundred dollars). One participant did not receive lights because he was already using CFLs so he did not need any. The participants were also asked about their satisfaction with the product quality. Most residents expressed some concerns with the lighting that they were provided with, noting that there was a warm up time for the lights to reach their full output and some said that they were not as bright as their old light bulbs. Both were reasons that some participants replaced the CFLs with their old lights after a short period of time. However, most thought that it was an adjustment that they could easily manage. Twenty –seven percent of homeowners independently stated that they had replaced some of the new bulbs with the old ones, generally within a few days of their assessment. Usually, the lights would only be replaced in places where respondents said they need immediate bright light. One participant noted that he would have been willing to pay extra to receive light-emitting diode (LED) bulbs. Currently, LED bulbs are not provided due to their high cost but both our interviews with CSG and Mass Save revealed that they would be moving towards providing LEDs during assessments in the future. A lighting catalog is available to homeowners who have had an assessment from which they can order LED and custom lights at-cost.

Thermostats were the second most common product distributed and were received by 22 participants. However, 17 of those residents did not have the thermostats installed, which requires the connection of two wires. In the past, auditors have hesitated to install the thermostats, mainly because there is a greater possibility of complications during the installation of the thermostat than with screwing in a light bulb, showerhead or faucet aerator. Auditors have run into the problem of a thermostat being connected to both the heating and cooling system, in which case the installation is much more complicated and requires an electrician. Other auditors may be concerned about installing new thermostats where touch-up painting or other aesthetic modifications maybe necessary. Seventeen respondents indicated that they did not receive thermostats at all. This may be because the kinds of thermostats distributed by Mass Save are not suited to all home situations, such as homes with high voltage thermostats. However, according to Ms. Sinatra, Mass Save is testing new universal thermostats that can be installed in a variety of homes and plans to provide these thermostats in the future.

Both the showerheads and faucet aerator reduce the flow of water, thereby reducing the amount of energy used to heat up water. Only 11 low-flow showerheads and 4 faucet aerators were distributed to homeowners. This may reflect the fact that many houses are fairly up-to-date and already have modern showerheads and faucets so auditors did not feel the need to replace them.

Overall, we found that participants felt neutral about the products that they were provided with, 57% saying that the products were okay, needed time to adjust or were neutral. 38% responded that they were either satisfied or very satisfied adjusting to the products. 5% were extremely dissatisfied with the products.

In addition to receiving products, auditors offered recommendations on home improvements that would decrease energy usage. Table 1 shows the number of participants that received a particular recommendation, how many have implemented it and how many plan to implement it. The remaining responses are those who do not plan to implement the recommendation in the future.

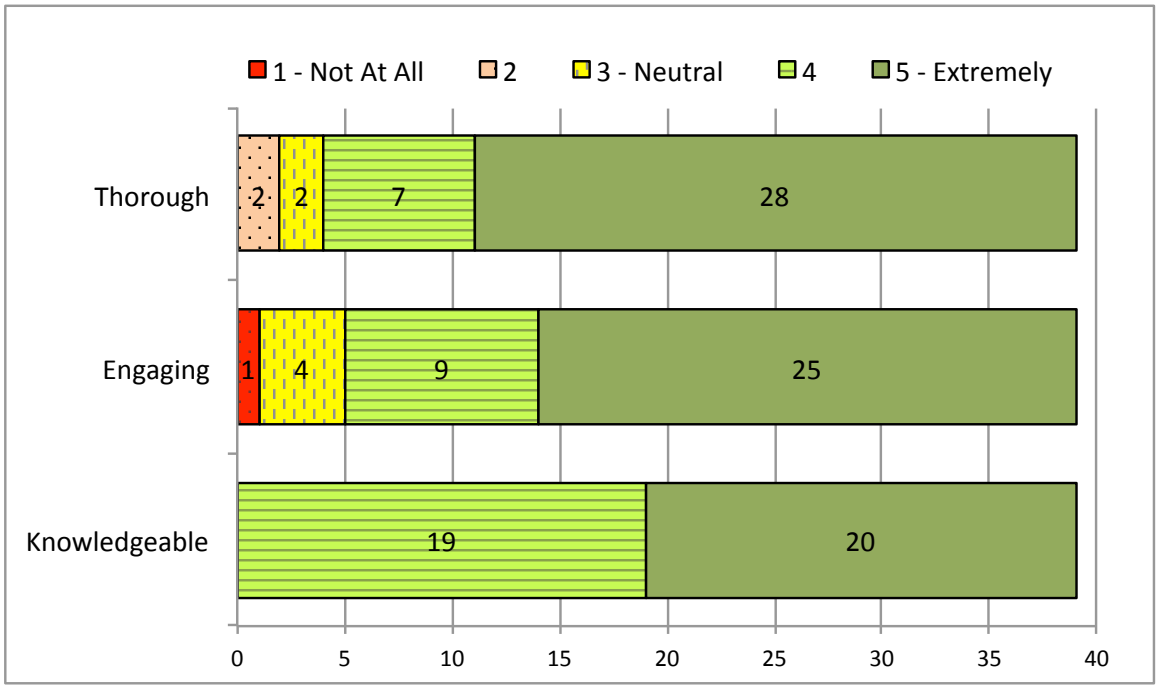
Table 1 - Auditors recommendations and participants responses

	Attic Insulation	Wall Insulation	Basement Insulation	Door Sealing	New Windows	Air Sealing	New Fridge	New Furnace
Rec. Made	11	3	4	4	1	2	8	5
Implemented	1	0	1	1	0	0	2	0
Future Implemented	7	1	3	1	0	1	1	3
No Action	**3**	**2**	**0**	**2**	**1**	**1**	**5**	**2**

Overall, auditors offered 38 general recommendations (includes multiple recommendations to same owner), seven (18%) of participants could not recall any recommendations, and four (11%) received unique recommendation such as installing dehumidifiers or air vents. Interestingly, out of 38 recommendations that were given, only five (13%) recommendations have actually been implemented. 18 of our respondents who received recommendations only had audits in November. So excluding these 18 homeowners, only 45% of surveyed homeowners from the January and April audit weeks have actually implemented one or more of the recommendations that they were given by the auditor. However out of the total 38 recommendations, 45% plan to do so within the next 6 months, leaving 42% who do not intend to implement any of the recommendation offered during their audit.

The survey also asked respondents for their opinions of their auditors. Fully, 100% thought the auditor arrived in a timely manner. Residents were then asked to rate a series of characteristics (thorough, engaging and knowledgeable) about the auditor on a scale of 1 to 5 (1 = Not At All (Characteristic) and 5 = Extremely (Characteristic)). The distribution of the ratings can be seen in Figure 14. It can be seen that none of the respondents rated less than a 2 on the question of thoroughness while 28 (76%) felt their auditor was “extremely thorough” for an average rating at 4.56. Generally, participants found their auditor very engaging and 100% thought the auditor was knowledgeable or extremely knowledgeable.

Figure 14 – Auditor characteristics as ranked on a scale of 1 to 5 (N=37)



Twenty-eight respondents suggested a variety of recommendations for improving the program. Five respondents (18%) indicated that they would like to see a variety of products offered and different incentive programs. Seven respondents (25%) said that they thought the assessment should be more educational and provide more information. Since the participants rated the auditors an average 4.51 (out of 5) on how knowledgeable they were. It can be gathered that the auditors had the ability to provide more information but were not able to in the time given. Four (14%) of the 28 participants suggested that the auditors be given more time for each assessment. Additionally, since auditors and contractors are coming on and off island there is a much longer wait time for assessments and contract work than for those on the mainland. This time could impact when participants implement recommendations and ultimately effect whether or not they follow through and complete it. Three (11%) of the 28 said that they thought the program needed more follow up. From the January and April audit weeks, three out of sixteen participants had received follow-up; one was from a separate insulating team, another received an email and the last received a call from Lauren Sinatra.

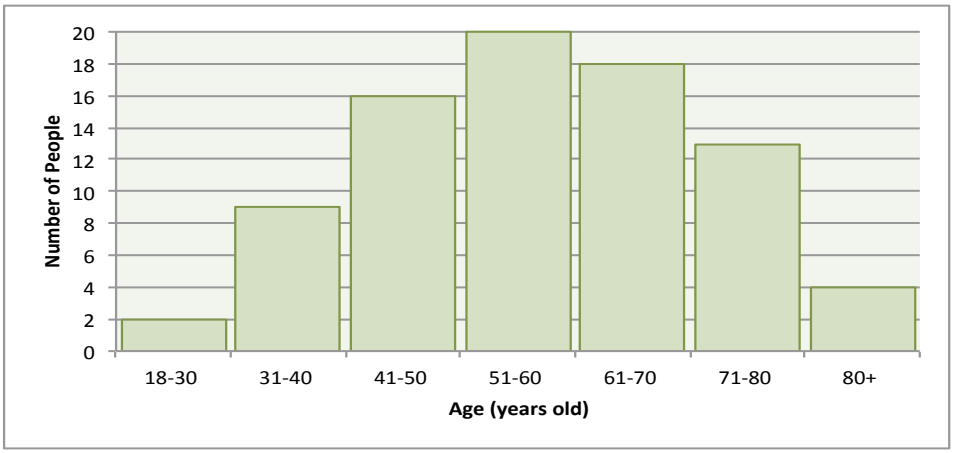
Many participants expressed that they had questions they thought of after the auditor left and they did not know whom they could call and ask.

Finally, participants were asked whether or not they would recommend the program. Fully, 100% of participants stated that they would, and 75% reported having done so already. Even residents who rated their satisfaction as less than 3 on a scale of 1 to 5 (1=not at all satisfied and 5=extremely satisfied) still felt it was a worthwhile program because they received "free" hardware. While not "free", the program is offered at no cost because it is paid through a surcharge on all National Grid electricity bills. Only 44% of participants were aware that they pay a surcharge on their electricity bill for the program.

4.3 General Population Survey Results

Between November 5 and 16, 2012, our team conducted 97 general population surveys (33 were completed online and 64 surveys in person). These surveys gathered information on the general awareness of no-cost home energy assessment programs, motivations for home energy efficiency changes, and interest in participating in the program. A full tabulation of the responses to the general population survey can be found in Appendix F. The sample included 92 year-round residents and 5 seasonal residents, while 73 were homeowners and 24 were renters. The distribution of respondent ages is shown in Figure 15.

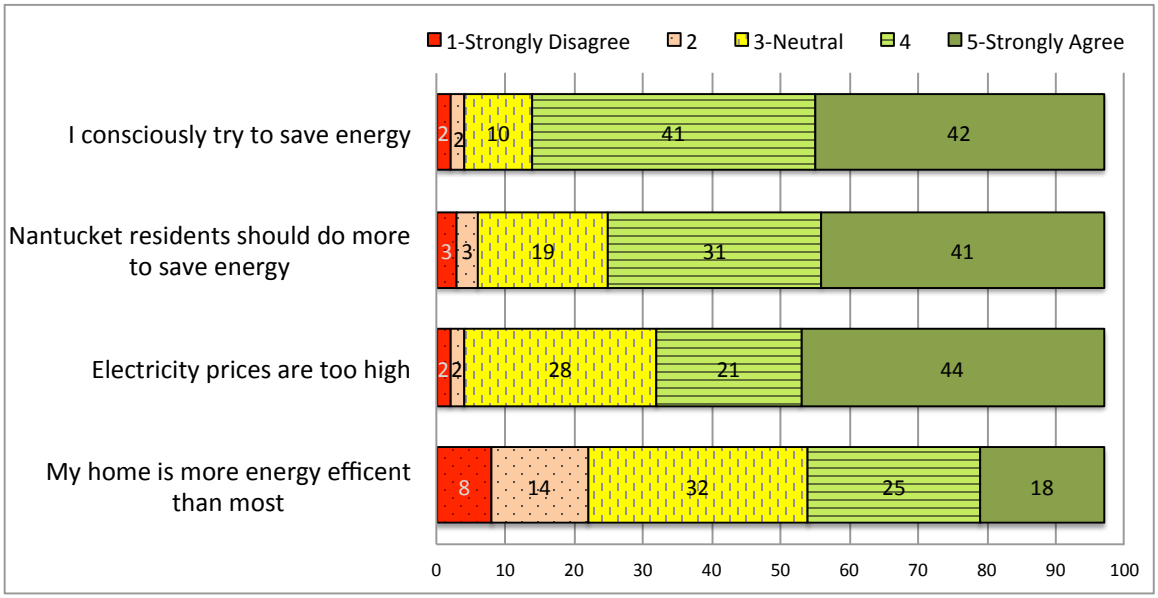
Figure 15 - Age Distribution for General Population Survey



4.3.1 Respondent Perspectives on Energy Conservation

Nantucket is a very environmentally conscious island, recycling 90 percent of household waste (MassDEP, 2009) and is beginning to invest more in alternative energy sources like solar panels. The general population surveys asked several questions to assess the overall levels of energy consciousness and awareness in the population. As shown in Figure 16, 83 out of 97 (86%) respondents agreed or strongly agreed that they consciously try to save energy. With Nantucket's energy prices ranking among the nation's highest, it was not surprising that 41 of 97 respondents (42%) thought electricity prices are too high. Additionally, 43 of the 97 respondents (44%) indicated they thought their house was more energy efficient than most and 72 of 97 (74%) agreed or strongly agreed that Nantucket residents should do more to save energy.

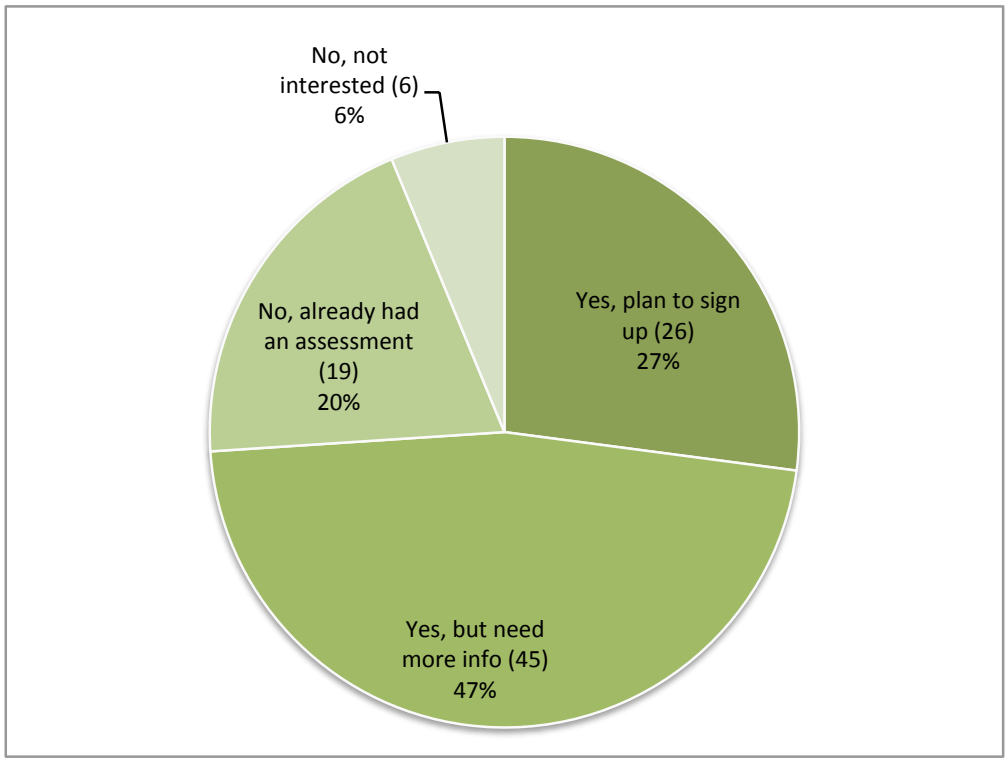
Figure 16 – Respondent Perspectives on Energy Conservation (N=96)



The data indicates that energy conservation is an important issue for Nantucket residents that many residents feel that their own homes are more efficient than most and that other Nantucket resident should do more to conserve energy. So, not only are Nantucket residents concerned about their own energy efficiency but also about the efforts of others on the island. This is further indicated by the fact that 73% of respondents expressed interest in signing up for an assessment in the future, 20% had already had an assessment, and only 6% (or six

respondents) expressed no interest in having an assessment at all (Figure 17). When asked for the reason preventing them from signing up, these six respondents gave unique explanations including one resident who was in the process of selling their home while another felt that they would not learn anything from having the assessment.

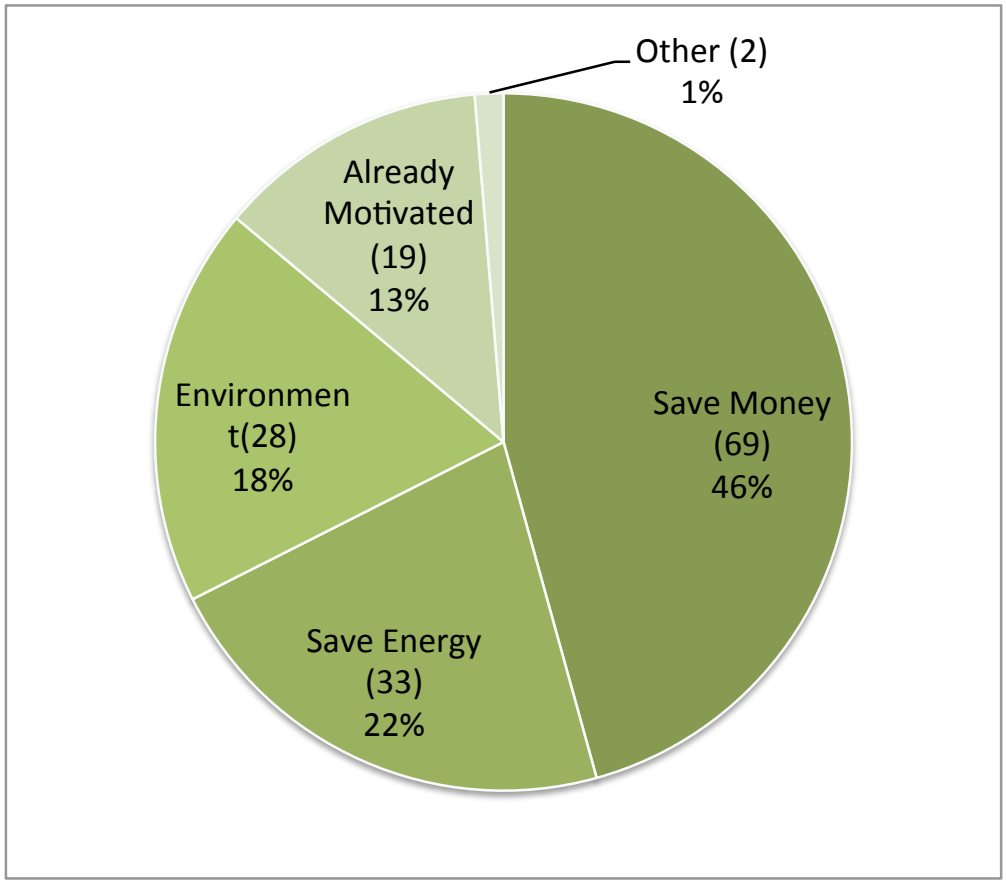
Figure 17 – Resident responses to the question, in the future, would you be interested in having a home energy assessment (N=96)



4.3.2 Motivation to Have a Home Energy Assessment

Forty-six percent of respondents said that saving money was the biggest motivator for making energy efficiency changes in their homes (Figure 18). Additionally, respondents identified saving energy (22%) and helping the environment (18%) as significant factors that would motivate them to make home energy efficiency changes. The results indicate that emphasizing cost savings may be the most effective way to enhance public participation in the program.

Figure 18 - Motivation to energy efficiency changes (N=151, multiple options allowed)

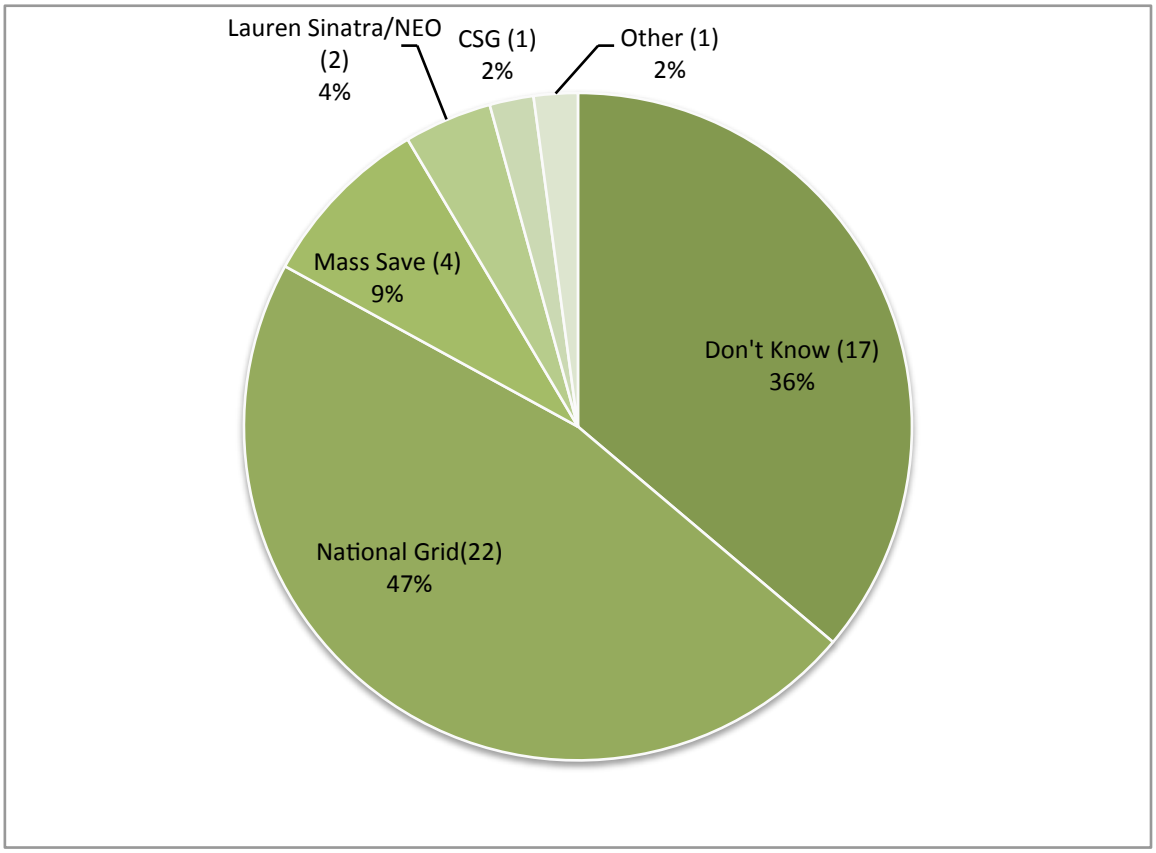


Out of the 47 respondents who had heard of a home energy assessment program, only 13 (28%) were aware of any incentives offered by that program, with free light bulbs accounting for 8 of the 13 responses. Respondents were then asked what percentage of their electricity bill they thought homeowners could save by having a home energy assessment. The average response was 20%. While respondents thought that they could save money by having an assessment, 68% were unaware that they pay a surcharge on their National Grid electricity bill for home energy efficiency programs like the Mass Save program.

4.3.3 Marketing Techniques

Marketing to date has been reasonably effective, since 48% of respondents had heard of no-cost home energy assessments. However, the data in Figure 11 shows that respondents have difficulty identifying the particular organization associated with the program.

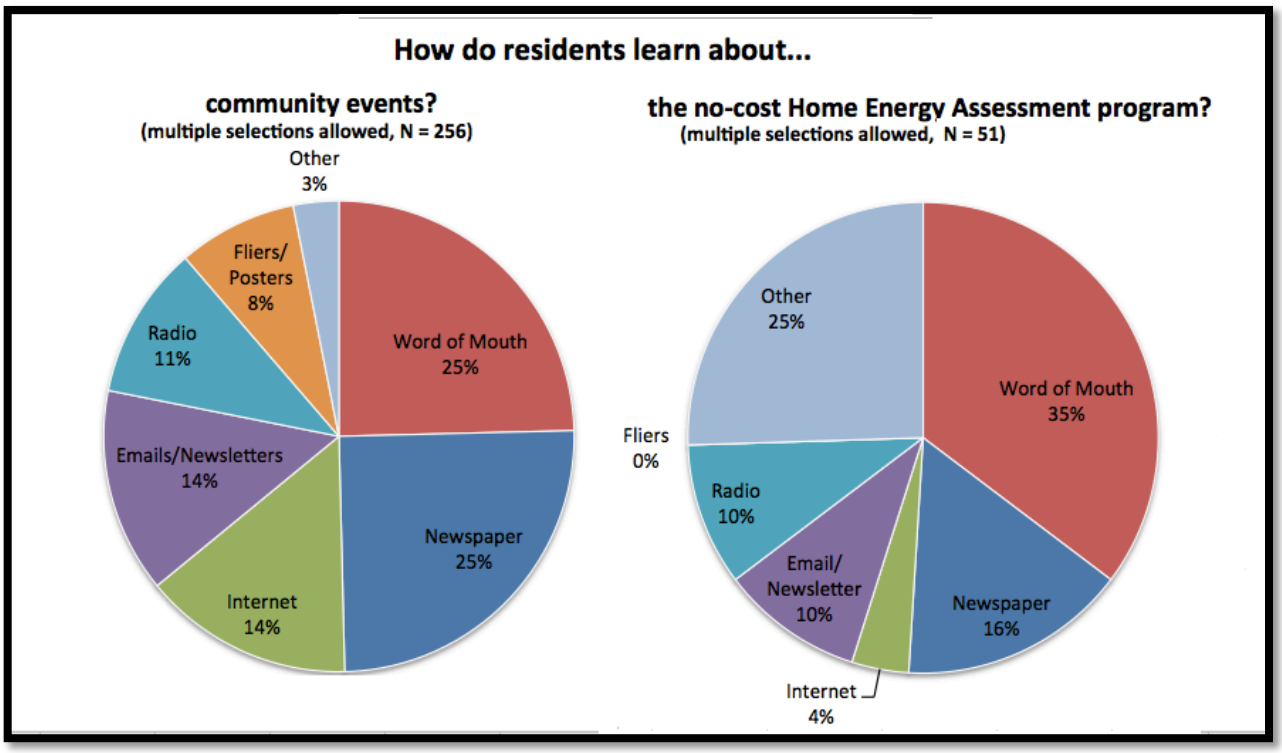
Figure 19 – Residents response to the question, what organizations do you associate with the no-cost home energy assessment program (N=47)



Although 47% of respondents who knew of a no-cost home energy assessment program identified National Grid as the organization associated with the program, another 36% could not identify any names or organization. Only 4% could identify the program by the name Mass Save. In short, the concept of a no-cost home energy assessment is familiar, yet a third of respondents are unable to connect the concept to an organization that provides the service.

Utilizing common marketing techniques that other organizations commonly rely on to publicize community events might well increase sign up for the Mass Save program. Figure 20 compares responses for how respondents had heard of a no-cost home energy assessment program and how they usually learn about community events.

Figure 20 - Comparison of how resident learn about community events and the no-cost home energy assessment program



While word of mouth and newspaper stand out as major information channels, the other response categories suggest possible alternative channels the Nantucket Energy Office might utilize, such as the Internet, and fliers or posters. Unfortunately, Ms. Sinatra is under strict budget constraints that limit her publishing regular advertisements in the local newspaper and creating other marketing materials outside of the materials provided by National Grid. While 47% of respondents knew of a home energy assessment program, only 34% knew that a Town representative could help them sign up for a home energy assessment.

5. Conclusions and Recommendations

Our overall analysis of the effectiveness of the Mass Save program shows that it has been very beneficial and well received by the Nantucket community. Our research has uncovered opportunities for program refinement to improve the public awareness, implementation and effectiveness. Our recommendations below, made to the Town of Nantucket Energy Office (NEO), Conservation Services Group (CSG), and National Grid, are intended to help improve this program for the future. It is up to these organizations to determine the most optimal way to implement these recommendations.

Conclusion 1: The current arrangement for conducting Home Energy Assessments (HEAs) creates a bottleneck that hinders the delivery and effectiveness of the program. By having all of the assessments packed into specific audit weeks, it limits when island residents can sign up for an audit, restricts how many audits can be conducted per year and creates substantial delays between sign-up and follow-up contract work. Approximately one out of every twenty households on Nantucket have been audited which would justify a consistent full-time on-island position to provide initial assessments and reassessments each year. Having on-island auditors and follow-on contractors would bring needed jobs to the Nantucket economy. However, Furthermore there is the issue of equity, given that both seasonal and year-round residents pay a surcharge for audits. On-island auditors would afford year-round and seasonal residents equal opportunity and access to energy assessments.

The program would significantly benefit from a system that allowed for much more flexibility, consistency and follow-through; therefore we make the following recommendation.

Recommendation 1: Develop a collaborative pilot model that would allow one or more local contractors to conduct Home Energy Assessments year-round on behalf of CSG.

This model would allow the Energy Office to continue to proactively market the Mass Save, and avoid the conflict of interest promoting a private company as an employee of the Town of Nantucket. Residents could continue to call Mass Save or Lauren Sinatra to signup for an HEA, but would be serviced by local contractors working closely with CSG. By certifying local auditors, the bottleneck problem would essentially be solved. Travel to Nantucket for designated audit weeks should not be viewed by CSG as a reward for exemplary employees. Rather, exemplary CSG employees could help train local auditors during the next designated audit weeks. The money that is currently being spent on transportation, housing and overtime for the auditors traveling to Nantucket from CSG's Westborough headquarters should be used to supplement the standard base pay for local auditors as there is an increased cost of living on the island. Additionally, CSG should be willing to consider a contract that would allow for the auditors to be licensed under CSG, rather than their own auditing group. This way, the auditors would be more likely to sign a contract knowing that they are focusing on the audits themselves rather than marketing and competition.

Until local auditors are certified, allow at least two hours for each assessment in addition to travel time. Additionally, increase the number of auditors to meet Nantucket's growing demand for audits and stay true to the commitment of quarterly visits.

Conclusion 2: A key part of an HEA is the provision of energy-saving products to participants. The homeowner participant survey revealed that respondents had varied expectations and degrees of previous knowledge about energy saving products prior to their assessment. Currently, customers are not provided specific information about the differences the products, specifically that CFL light bulbs have a warm up period, whereas incandescent bulbs do not. We found that some

homeowners remove their CFL bulbs after their assessment, as they are unhappy with their performance, which wastes product and lowers energy savings. Additionally, thermostats were challenging to install and operate since they require programming. Creating uniform expectations and knowledge of the products provided may increase actual product usage and overall satisfaction. It is critical to leave all participants with the proper knowledge and comfort level so that products are not left unused. The following recommendations are intended to create more uniform expectations and foster more complete installation.

Recommendation 2: Auditors should focus on giving clear information about product performance prior to installation and clear instructions about the operation of these products, especially thermostats.

Product information should clearly explain that the CFLs will not appear as bright initially but will brighten up, and that the showerheads will have a different water pressure. The auditor should show residents how to program the thermostat and have the participant repeat back the instructions to ensure that they understand the procedure. If the auditor is unable to install the thermostat, he or she should clearly explain how the homeowner can install it or provide contact information of a local electrician, certified under the Mass Save program, who can come to install the thermostat at a later date. After product installation, the auditor may inquire about homeowner satisfaction with the installed products and uninstall any that are deemed unsatisfactory.

Conclusion 3: Generally, homeowner expectations and levels of preparedness going into an assessment varied. Currently, when scheduling audits over the phone, CSG will explain that an audit will take about two hours, briefly explain audit procedure and that homeowners should have past electricity bills to present to the auditor. The variation of preparedness suggests that an alternative means of providing pre-audit expectations and requirements would benefit both the homeowner and auditor to ensure a smooth execution. Specifically on Nantucket, clear contact beforehand will

insure that caretakers have the proper information from the homeowner to provide to the auditor.

Recommendation 3: Inform program participants about the process of the audit, program outcomes and necessary preparations prior to the assessment with clear documentation.

Utilize emails given by participants at the time of sign up to send a concrete, electronic document containing an overview of the audit procedure, expected time commitment and program outcomes, including possible products. Additionally, calling to confirm appointment times and reiterating preparation information will help to ensure homeowners are ready for their assessments.

Conclusion 4: Follow-up is a crucial step to actively encouraging residents to implement energy efficiency changes as researched in our literature review. Our research showed an absence of any consistent follow-up after assessments are done on Nantucket. Furthermore, participants appear to be very confused about whom to call with questions following the assessment. Currently, follow-up has been done only after contract work is complete but this excludes any homeowners whose homes did not require any contract work but still have questions. Allowing residents to provide feedback can help to improve the program for the future and identify any unique situations specific to Nantucket.

Recommendation 4: Create a follow-up system geared to answer questions participants have following their assessment and help identify areas of improvement in the program.

Utilize the emails provided at the time of sign up to increase follow-up efficiency by. Specifically, because Nantucket has a much higher percentage of seasonal residents, sending emails including a satisfaction survey and contact information to direct any questions about the assessment or recommendations

would be the best way to contact participants. By following up with residents, areas for improvement can be identified and homeowner questions about products and contract work can be resolved. Additionally, CSG should identify a local electrician or contractor who can provide more information the participants has questions. It would be much easier for a local to potential go and visit a home to look at any additional work the participant would be considering having done.

Conclusion 5: Word of mouth is the most common ways residents learned about the Mass Save program on Nantucket. Furthermore, 100% of participating homeowners that we surveyed would recommend the program but it would be useful for them to be able to give something other than the name of the program to their neighbors, friends and family.

Recommendation 5: Have auditors leave Mass Save brochures with homeowners after they have completed the assessment as marketing material.

Giving out brochures would encourage residents to call for an assessment because they have all the information about the program readily available to them rather than having to search for the information on their own.

Conclusion 6: Although word of mouth is the most common way residents hear about community programs and the Mass Save program, other communication channels are worth using. Applying marketing devices that respondents identified as common ways they learn about community events can help increase awareness of the Mass Save program. For example, 14% of respondents reported using the Internet to learn about events in the community, a medium that only 4% of respondents used to discover the no-cost home energy assessment program. Furthermore, if Ms. Sinatra acquires 16% interest from running two newspaper advertisements in the weeks leading up to an audit week, then adding additional

advertisements holds the potential for more residents to recognize the program and sign up for an assessment.

Recommendation 6: Utilize the Internet and newspaper advertisements to the fullest extent to reach the most amount of residents.

By seeking out additional funds from Mass Save, Ms. Sinatra can more effectively market the program through increased advertisement in the local newspaper and online advertisements on local websites like Mahon About Town, the Town of Nantucket website and community events calendar. Since word of mouth is such a prevalent means of advertising on Nantucket, personal testimonials from local leaders would be powerful vehicles to enhance participation, specifically from the Board of Selectmen and Town administration. Additionally, publicizing Ms. Sinatra's position as liaison between National Grid and the town who can help with assessment sign up may encourage more residents to enroll, as they may be more comfortable working with a local resident.

Conclusion 7: For the program to grow and continue to benefit Nantucket residents, general awareness must proliferate so that more residents can take advantage of the program. Respondents to the general population survey identified "saving money" and "saving energy" most frequently as motivating factors for making energy efficiency changes in their homes. While approximately half of respondents knew of the overall concept of a no-cost home energy assessment, details of the program varied between respondents. It would be beneficial to identify specific money saving opportunities to highlight in future marketing materials as only 28% of the 47 respondents who had heard of a no-cost home energy assessment knew of any incentives offered by the program. By including the incentives offered to customers in the marketing materials, residents may be more motivated to sign up and take advantage of them. Additionally, advertising new energy efficient technologies will help attract more energy conscious residents who feel they are already efficient.

Recommendation 7: Focus on advertising incentives that will easily save money and energy for homeowners.

Specifically accenting products participants could receive during an assessment, like CFLs and programmable thermostats, will help to generate more interest from residents who are looking to save money. Additionally, providing information on the no-interest loans and rebates offered will interest curiosity for residents considering big contract work for their homes, like insulation or installing new appliances.

Conclusion 8: Only 44% of the participating homeowners and a 37% of the general population that we surveyed knew they were paying a surcharge on their electricity bill for energy efficiency programs. A majority of those who were unaware were surprised to learn that they were already paying for this service. Publicizing customer entitlement to this program and highlighting the surcharge may motivate residents to sign up for an assessment and take advantage of the program.

Recommendation 8: Include more information in bills and advertisements about the surcharge that all customers are currently paying.

If more people knew they were paying for this program, they might be more likely to take advantage of it. It is important to homeowners who have an assessment know where the money funding the program is coming from, as they may have believed that the Mass Save program was "free" as opposed to "no-cost" and, as a result, have a negative association of the program.

The Mass Save program has shown its success on Nantucket in the overwhelming support for the program and participant willingness to recommend it to others. Our recommendations above, based on observations made during the

duration of this project, offer the possibility of broadening participation and strengthening program implementation for the future.

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Appendix A - Survey for Program Participants (WPI Pre-tested)

(WPI Faculty Pre-Tested)

Preamble: We are students from WPI conducting a survey on the Mass Save Home Energy Assessment Program. Would you be willing to let us interview you about your experience with the Mass Save Program? Your participation in the interview is completely voluntary and you may withdraw at any time. Your answers will remain anonymous unless you agreed to be quoted in which case you have the right to review any quotes.

Name:

When was your Audit Conducted? (Approx): _____

Type of Housing

1. Are you an owner or a renter, other?

2. Do you pay for your own?
   - ☐ Electricity
   - ☐ Heating

3. What type of Housing do you live in:
   - ☐ Single Family
   - ☐ Multiple Family: (#)_____

4. Number of People living home: _____

5. Approximate age of home: _____

6. Have you attempted any energy conservation methods prior to having an audit?

Pre-HEA:

1. How did you learn about Mass Save? (insert, word of mouth, fliers, don't know, other)

2. How easy was it to sign up for an audit?

Not Difficult Neutral Difficult

1 2 3 4 5 6 7

Process of signing up:

3. Why were you interested in having a Home Energy Assessment?
   (Reduce Energy cost/save money, save energy, see recommendations, House is too cold)

4. What did you expect to learn or gain for the HEA? (how to save money, energy, other)

Auditor:

5. Did the auditor arrive in a timely manner?

6. Was the auditor:

Knowledgeable:

1	2	3	4	5	6	7

Friendly:

1	2	3	4	5	6	7

Comments on Auditor:

About HEA:

1. What is your overall satisfaction with your HEA?

Not Satisfied			Neutral			Satisfied
1	2	3	4	5	6	7

   a. Less than a 5: Why weren't you satisfied?

2. How long was the overall HEA? (time)

3. What physical changes did the auditor make to your home during the audit?
   Installed (y/n)
   - ☐ Light bulbs (y / n)
   - ☐ Thermostat (y / n)
   - ☐ Power strips
   - ☐ Low flow showerhead (y / n)
   - ☐ Weather Stripping (y / n)

4. What recommendations did the auditor make for your home? (multiple allowed)
   - ☐ Attic Insulation
   - ☐ Wall Insulation
   - ☐ Basement Insulation
   - ☐ Door Sealing
   - ☐ New Windows
   - ☐ Air Sealing
   - ☐ New Refrigerator
   - ☐ New Furnace
   - ☐ Pipe Insulation
   - ☐ Power strips / smart strips
   - ☐ Other: _____

5. What recommendations have you implemented? (multiple allowed)
   - ☐ Attic Insulation
   - ☐ Wall Insulation
   - ☐ Basement Insulation
   - ☐ Door Sealing
   - ☐ New Windows
   - ☐ Air Sealing
   - ☐ New Refrigerator
   - ☐ New Furnace
   - ☐ Pipe Insulation
   - ☐ Power strips / smart strips
   - ☐ Other: _____

6. What changes do you plan to implement in the future? (multiple allowed)
   - ☐ Attic Insulation
   - ☐ Wall Insulation
   - ☐ Basement Insulation
   - ☐ Door Sealing
   - ☐ New Windows
   - ☐ Air Sealing
   - ☐ New Refrigerator
   - ☐ New Furnace
   - ☐ Pipe Insulation
   - ☐ Power strips / smart strips
   - ☐ Other: _____

7. How useful were the recommendations given?

Not Useful				Neutral		Useful
1	2	3	4	5	6	7

Less than a 5: Why do you not feel they were useful?

8. Did you know about any of the recommendation made by the auditor beforehand?

9. Have you noticed a change your behavior following the audit? (Have not, Turn off lights, thermostat settings, More clothing, bedding)

10. Have you noticed a change in your energy bill?

Increase				No Change		Decrease
1	2	3	4	5	6	7

11. If Installed Insulation, have you noticed a change in the temperature retention of your house?

Losses More Heat				No Change		Holds More Heat
1	2	3	4	5	6	7

12. Would you recommend this program to?

NO				MAYBE		YES
1	2	3	4	5	6	7

Have you recommended the program: (Y / N)
Less than 4: Particular reason why?

13. Did you learn new energy conservation techniques you had not known about previously? What?

14. What recommendations do you have to improving the program?

Thank you!

Consent for initial testimonial:

Would you be willing to let us quote you in our final report or in marketing material for the Mass Save Program? You will have the right to review and refuse any specific quotation we use beforehand.

Appendix B – Survey for Program Participant (Prior to November 2012)

Date: _____ Interviewer: _____ Secretary: _____

Preamble: We are students from WPI conducting a survey on the Mass Save Home Energy Assessment Program. Would you be willing to let us interview you about your experience with the Mass Save Program? Your participation in the interview is completely voluntary and you may withdraw at any time. Your answers will remain confidential unless you agreed to be quoted in which case you have the right to review any quotes.

Name:

When was your assessment conducted?

□ January 2012
□ April 2012
□ Don't Know

Type of Housing

1. Do you own or rent the residence that was assessed?
   □ Own
   □ Rent

   1.1 If renter, do you pay for your own utilities or are they included in your rent?
   □ Electricity
   □ Oil
   □ Gas
   □ Included in the rent

2. Approximate age of home: _____

3. How do you heat your home?
   □ Electric
   □ Oil
   □ Gas

4. Prior to having the assessment, how would you have rated the efficiency of your home?

Not At All Efficient		Neutral		Extremely Efficient
1	2	3	4	5

Pre-HEA:

5. Prior to your assessment, did you take any active steps to save energy?
   □ Yes
   □ No
   If yes, what did you do? (ex. Light bulbs, energy star appliances weather stripping etc.)?

6. How did you learn about Mass Save?

□ Electric Bill Insert
□ Word of Mouth
□ Posters/Fliers
□ Newspaper Ad
□ Newsletter
□ Radio
□ Facebook
□ Building Inspector
□ Don't Recall
□ Other:

7. How did you sign up for your Mass Save home energy assessment?
   □ Nantucket Energy Office (Lauren Sinatra) – EMAILED
   □ Nantucket Energy Office (Lauren Sinatra) - CALLED
   □ Mass Save / Conservation Services Group – EMAILED
   □ Mass Save / Conservation Services Group – CALLED

8. How easy was it to schedule your assessment? Can you tell me more about the process?

9. What was your primary reason for having a Home Energy Assessment?
   □ Reduce Energy
   □ Save Money/ Financial
   □ Incentives Offered (loans, cost savings)
   □ Freebies Given Out (light bulbs, thermostat etc.)
   □ See Recommendations / Curiosity
   □ Drafty House
   □ Required for Renovations
   □ It's free (have nothing to lose)
   □ Other:

10. What did you expect to learn or gain from the HEA? (how to save money, energy, other)
    □ Reduce Energy
    □ Reduce Cost/Save Money
    □ See Recommendations
    □ Nothing
    □ Other:

Auditor:

11. Did the auditor arrive in a timely manner?
    □ Yes
    □ No

12. Was the auditor:

Knowledgeable:

Not At All Knowledgeable — Extremely Knowledgeable

1 2 3 4 5

Engaging:

Not At All Engaging — Extremely Engaging

1 2 3 4 5

Thorough:

Not At All Thorough — Extremely Thorough

1 2 3 4 5

Comments about auditor:

Was there anything you didn't like about the auditor?

About HEA:

13. How long was the overall HEA? (time)

14. Which products did the auditor provide during the assessment? Did they install them for you?

Product Received	Installed?	How Many?
□ Light bulbs	Y / N	
□ Thermostat	Y / N	
□ Power Strips	Y / N	
□ Low Flow Shower Heads	Y / N	
□ Weather Stripping	Y / N	
□ Faucet Aerator	Y / N	

15. How satisfied were you with the quality of these products?

16. What energy saving measures did the auditor suggest for your home? (multiple allowed)
    □ Attic Insulation
    □ Wall Insulation
    □ Basement Insulation

□ Door Sealing
□ New Windows
□ Air Sealing
□ New Refrigerator
□ New Furnace
□ Pipe Insulation
□ Other:

17. Did anyone follow up with you after you had your home energy assessment?
□ Yes
□ No Comments:

If yes, who? _____

How did they contact you?
□ Phone
□ Email
□ Letter

18. Did the auditor explain to you the incentives and programs provided by National Grid?
□ Yes
□ No

19. What recommendations have you implemented? (multiple allowed)
□ Attic Insulation
□ Wall Insulation
□ Basement Insulation
□ Door Sealing
□ New Windows
□ Air Sealing
□ New Refrigerator
□ New Furnace
□ Pipe Insulation
□ Other:

20. Did you take advantage of any of the incentives and programs that National Grid offers?
□ Yes
□ No

21. What changes do you plan to implement in the next 6 months? (multiple allowed)
□ Attic Insulation
□ Wall Insulation
□ Basement Insulation
□ Door Sealing
□ New Windows
□ Air Sealing

□ New Refrigerator
□ New Furnace
□ Pipe Insulation
□ Other:

22. Were any of the recommendations unexpected or unforeseen to you?
    - ☐ Yes
    - ☐ No

    Which ones?

23. Do you feel the assessment was worth the time commitment?

Waste of Time		Neutral		Worth It
1	2	3	4	5

24. Were you already aware of the energy saving opportunities the auditor presented to you or were any surprising?
    □ Surprising (Comments):

    □ Already Aware (Comments):

25. Have you noticed any changes in your behavior since you have had the assessment?
    □ Turn off lights
    □ Thermostat settings
    □ More clothing
    □ Bedding
    □ Not at all
    □ Other:

26. Have you seen a noticeable reduction in your electric bill since having the assessment?
    □ Yes
    □ No
    □ Don't Know
    □ Too Soon to Tell

27. If installed insulation, have you noticed a change in the temperature retention of your house?

Loses More Heat		No Change		Holds More Heat
1	2	3	4	5

28. After having the assessment, how would you rate the efficiency of your home on a scale of 1 to 5?

Not At All Efficient	Neutral	Extremely Efficient

1 2 3 4 5

29. What is your overall satisfaction with your HEA?

Not At All Satisfied		Neutral		Extremely Satisfied
1	2	3	4	5

Less than a 3: Why weren't you satisfied?

30. Would you recommend this program to a friend/family?
    - ☐ Yes
    - ☐ Maybe
    - ☐ No

    If No or Maybe: Particular reason why?

30a. Have you recommended the program to anyone?
- ☐ Yes
- ☐ No

31. Did you learn about any new energy conservation techniques that you had not known about previously? Which ones?

32. Are you aware that there is a surcharge for energy efficiency programs like your HEA in your electric bills?

33. What recommendations do you have to improve the program?

Thank you!

Would you be willing to let us quote you in our final report or in marketing material for the Mass Save Program? You will have the right to review and refuse any specific quotation we use beforehand.

Appendix C - Survey for Program Participants (November 2012)

Date: _____ Interviewer: _____ Secretary: _____

Preamble: We are students from WPI conducting a survey on the Mass Save Home Energy Assessment Program. Would you be willing to let us interview you about your experience with the Mass Save Program? Your participation in the interview is completely voluntary and you may withdraw at any time. Your answers will remain confidential unless you agreed to be quoted in which case you have the right to review any quotes.

Name:

Type of Housing

1. Do you own or rent the residence that was assessed?
   □ Own
   □ Rent

   1.2 If renter, do you pay for your own utilities or are they included in your rent?
   □ Electricity
   □ Oil
   □ Gas
   □ Included in the rent

2. Approximate age of home: _____

3. How do you heat your home?
   □ Electric
   □ Oil
   □ Gas

4. Before the assessment, how would you have rated the efficiency of your home on a scale of 1 - 5?

Not At All Efficient		Neutral		Extremely Efficient
1	2	3	4	5

Pre-HEA:

5. Prior to your assessment, did you take any active steps to save energy?
   □ Yes
   □ No
   If yes, what did you do (ex. Light bulbs, energy star appliances, weather stripping)

6. How did you learn about Mass Save?
   □ Electric Bill Insert
   □ Word of Mouth
   □ Posters/Fliers
   □ Newspaper Ad
   □ Newsletter
   □ Radio
   □ Facebook
   □ Building Inspector
   □ Don't Recall
   □ Other:

7. How did you sign up for your Mass Save home energy assessment?
   - ☐ Nantucket Energy Office (Lauren Sinatra) – EMAILED
   - ☐ Nantucket Energy Office (Lauren Sinatra) - CALLED
   - ☐ Mass Save / Conservation Services Group – EMAILED
   - ☐ Mass Save / Conservation Services Group – CALLED

8. How easy was it schedule your assessment? Can you tell me more about the process?

9. What was your primary reason for having a Home Energy Assessment?
   □ Reduce Energy
   □ Save Money/ Financial
   □ Incentives Offered (loans, cost savings)
   □ Freebies Given Out (light bulbs, thermostat etc.)
   □ See Recommendations / Curiosity
   □ Drafty House
   □ Required for Renovations
   □ It's free (have nothing to lose)
   □ Other:

10. What did you expect to learn or gain from the HEA? (how to save money, energy, other)
    □ Reduce Energy
    □ Reduce Cost/Save Money
    □ See Recommendations
    □ Nothing
    □ Other:

Auditor:

11. Did the auditor arrive in a timely manner?
    □ Yes
    □ No

12. Was the auditor:

Knowledgeable:

Not At All Knowledgeable				Extremely Knowledgeable
1	2	3	4	5

Engaging:

Not At All Engaging				Extremely Engaging
1	2	3	4	5

Thorough:

Not At All Thorough				Extremely Thorough
1	2	3	4	5

Comments about auditor?:

Was there anything you didn't like about the auditor?

About HEA:

13. How long was the overall HEA? (time)

14. Which products did the auditor provide during the assessment? Did they install them for you?

Product Received	Installed?	How Many?
□ Light bulbs	Y / N	
□ Thermostat	Y / N	
□ Power Strips	Y / N	
□ Low Flow Shower Heads	Y / N	
□ Weather Stripping	Y / N	
□ Faucet Aerator	Y / N	

15. How satisfied were you with the quality of these products?

16. What energy saving measures did the auditor suggest for your home? (multiple allowed)

□ Attic Insulation
□ Wall Insulation
□ Basement Insulation
□ Door Sealing
□ New Windows
□ Air Sealing
□ New Refrigerator
□ New Furnace
□ Pipe Insulation
□ Other:

17. Did the auditor explain to you the incentives and programs provided by National Grid?
□ Yes
□ No Comments:

18. What changes do you plan to implement in the next 6 months? (multiple allowed)
□ Attic Insulation
□ Wall Insulation
□ Basement Insulation
□ Door Sealing
□ New Windows
□ Air Sealing
□ New Refrigerator
□ New Furnace
□ Pipe Insulation
□ Other:

19. Do you feel the assessment was worth the time commitment?

Waste of Time		Neutral		Worth It
1	2	3	4	5

20. Were you already aware of the energy saving opportunities the auditor presented to you or were any surprising?
□ Surprising (Comments):

□ Already Aware (Comments):

21. What is your overall satisfaction with your HEA?

Not At All Satisfied		Neutral		Extremely Satisfied
1	2	3	4	5

Less than a 3: Why weren't you satisfied?

22. Would you recommend this program to a friend/family?
□ Yes

□ No

23. Have you recommended the program to anyone?
    □ Yes
    □ No

24. Did you learn about any new energy conservation techniques that you had not known about previously? Which ones?

25. Are you aware that there is a surcharge for energy efficiency programs like your HEA in your electric bills?

26. What recommendations do you have to improve the program?

Thank you!

Would you be willing to let us quote you in our final report or in marketing material for the Mass Save Program? You will have the right to review and refuse any specific quotation we use beforehand.

Appendix D – Survey for General Population

Preamble: We are students from WPI conducting a survey on the Mass Save Home Energy Assessment Program. Would you be willing to let us interview you about your experience with the Mass Save Program? Your participation in the interview is completely voluntary and you may withdraw at any time. Your answers will remain anonymous unless you agreed to be quoted in which case you have the right to review any quotes.

1. When are you at your Nantucket residence?

□ Year-round Resident
□ Seasonal Resident

2. Where on the island is your residence located?

☐ In Town
☐ Mid-Island
☐ Madaket
☐ Siasconset
☐ Other: _____

3. Do you rent or own your place of residence?

□ Own □ Rent

4. Below are a series of statements. Please indicate how much you agree or disagree with each:

a. I consciously try to save energy.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

b. Nantucket residents need to do more to save energy.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

c. Prices of electricity on Nantucket are too high.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

d. My home is more energy efficient than most.

Strongly Disagree		Neutral		Strongly Agree
1	2	3	4	5

5. Have you heard of any no-cost Home Energy Assessment (HEA)/Audit programs?

□ Yes □ No (Skip to Questions 9)

6. What name or organizations do you associate with the program?

7. How did you hear about that program?

(Check all that apply)

□ Mailing Insert
□ Word of mouth
□ Flier/Poster Around Town
□ Newspaper
□ Email/Newsletter
□ Radio
□ Internet (Facebook, Town Website, Other Websites)
□ I Don't Know
□ Other:

8. Do you know anyone who has had an HEA under the Mass Save Program?

□ Yes □ No

9. What percentage do you think homeowners can save on their electricity bills by having an HEA?

_____%

10. How do you usually learn about programs and events in the community? *(Check all that apply)*

□ Fliers/Posters Around Town
□ Word of Mouth
□ Internet (Facebook, Town Website websites, etc.)
□ Emails/Newsletters
□ Newspapers
□ Radio
□ TV
□ I Don't know
□ Other:

11. Are you aware there is a person in the town Energy Office who can help you set up a Home Energy Assessment?

□ Yes □ No

12. Did you know that you pay a surcharge in your National Grid electricity bill for energy efficiency programs like the Mass Save program?

□ Yes □ No

13. What do you know about any of the incentives offered by this program? *(You can skip this if you don't know of any)*

14. What would most motivate you to make energy efficiency improvements in your home?

□ Save Money/Lower Cost of Bill
□ Save Energy
□ Help the Environment
□ I am already motivated
□ Other:

15. In the future, would you be interested in having a Home Energy Assessment?

□ Yes, I plan to sign up for an assessment

- ☐ Yes, but would need to know more information
- ☐ No, I have already had one
- ☐ No, I am not interested

16. If no, would you care to explain why not interested?

Appendix E – Homeowner survey results

Homeowner Survey Results
Total Surveys collected = 39
From the dates: 11/1/2012 - 11/26/2012

Question 1. When was your assessment conducted? (N=39)	
Response	**Number of Responses**
January 2012	9
April 2012	7
November 2012	23

Question 2. Do you own or rent the residence that was assessed? (N=39)	
Response	**Number of Responses**
Own	36
Rent	3

Question 3. What is the approximate age of your home? (N=39)	
Response	**Number of Responses**
0 – 5 years	0
6 – 15 years	9
16 – 25 years	18
26 – 35 years	3
36 – 50 years	3
51 – 100 years	3
100 – 300 years	3

Question 4. How do you heat your home? (N=39)	
Response	**Number of Responses**
Electricity	4
Oil	16
Gas/Propane	17
Other	2

Question 5. Prior to having an assessment, how you have rated the efficiency of your home on a scale of 1 to 5 (1 is Not At All Efficient and 5 is Extremely Efficient)? (N=39)	
Response	**Number of Responses**
1	2
2	3
3	18
4	15
5	1

Question 6. Prior to having your assessment, did you take any active steps to save energy? (N=39)	
Response	**Number of Responses**
Yes	31
No	8

Question 6b. If yes, what active steps have you taken to save energy? (N=31)	
Response	**Number of Responses**
New Home/Built to be efficient	4
Changed Behavior	4
Weatherization/Insulation	11
Installed Energy Efficient Appliances	3
Changed Light bulbs	9

Question 7. How did you learn about the Mass Save Program? (N=39)	
Response	**Number of Responses**
Mailing Insert / National Grid	9
Word of Mouth	17
Nantucket Energy Office/Lauren Sinatra	2
Newspaper	7
Radio	1
Internet	1
Other	2

Question 8. How did you sign up for your Mass Save home energy assessment? (N=39)	
Response	**Number of Responses**
Emailed Nantucket Energy Office	15
Called Nantucket Energy Office	7
Emailed Conservation Services Group	1
Called Conservation Services Group	16

Question 9. How easy was it to schedule your home energy assessment? (N=39)	
Response	**Number of Responses**
Easy	33
Was Put on Waitlist	3
Had to Call Multiple Times	3

Question 10. What was your primary reason for having a Home Energy Assessment? (N=39)	
Response	**Number of Responses**
Reduce Energy	9
Save Money	14
Incentives Offered	1
Free Products	4
See Recommendations	3
Drafty House	4
Curious/Concerned	4

Question 11. What did you expect to learn or gain from the home energy assessment? (N=39)	
Response	**Number of Responses**
Reduce Energy	8
Reduce Cost/Save Money	9
Incentives	8
Curious/ See Recommendations	13
Freebies	1

Question 12. Did the auditor arrive in a timely manner? (N=39)	
Response	**Number of Responses**
Yes	39
No	0

Question 13. On a scale of 1 to 5 how would you rate the following characteristics of your auditor: (1 is Not at All, 3 is Neutral, 5 is Extremely) (N=39)					
	1	**2**	**3**	**4**	**5**
Knowledgeable	0	0	0	19	20
Engaging	1	0	4	9	25
Thorough	0	2	2	7	28

Question 13b. Do you have any additional comments about the auditor? Anything you didn't like about him/her? (N=39)	
Response	**Number of Responses**
Friendly/Personable	10
Impressed/Thorough	12
Missed Areas/Rushed	7
No Comment	9
Other	1

Question 14. How long was the overall home energy assessment? (N=39)	
Response	**Number of Responses**
0 – 30 minutes	1
31 – 60 minutes	8
61 – 90 minutes	14
91 – 120 minutes	11
121+ minutes	5

Question 15. Which products did the auditor provide during the assessment? How many did you receive? Did the auditor install them for you?(N=39)			
Product	**Received**	**Installed**	**Avg. Amount**
Light Bulbs	38	37	20
Thermostat	22	17	2.5
Low Flow Shower Heads	11	10	2
Faucet Aerator	4	3	2

Question 15b. What was your overall satisfaction with the products provided to you by the auditor? (N=39)	
Response	**Number of Responses**
Changed out some light bulbs after audit	10
Great	15
Neutral	10
Dissatisfied	2

Question 16. What energy saving measures did the auditor suggest for your home? (N=39, multiple choices allowed)	
Response	**Number of Responses**
Attic Insulation	11
Wall Insulation	3
Basement Insulation	4
Door Sealing	4
New Windows	1
Air Sealing	5
New Refrigerator	9
New Furnace	5
Pipe Insulation	0
Other*	11

*Breakdown of other responses can be seen below

Question 16b. Breakdown of "Other" energy saving measures suggested by auditors (N=11, multiple choices allowed)	
Response	**Number of Responses**
Attic Door Cover	2
Vapor Barrier/Dehumidifier	4
New Hot Water Heater/Boiler	4
Solar Panels	1

Question 17. Did anyone follow up with you after you had your home energy assessment? (N=16)	
Response	**Number of Responses**
Yes *	3
No	13

* Of the 3 residents who reported follow up, 1 was contacted by Lauren Sinatra at the Nantucket Energy Office, 1 was contacted by CSG/Mass Save and 1 was contacted by the contractor scheduled to do insulation work.

Question 18. Did the auditor explain to you the programs and incentives offered by National Grid? (N=39)	
Response	**Number of Responses**
Yes	29
No	10

Question 19. What recommendations have you implemented? (N=16)	
Response	**Number of Responses**
Attic Insulation	1
Wall Insulation	0
Basement Insulation	1
Door Sealing	1
New Windows	0
Air Sealing	0
New Refrigerator	2
New Furnace	0
Pipe Insulation	0
Other *	3

* Other category includes installing thermostats, installing light bulbs and turning down dehumidifier to a lower setting

Question 20. Did you take advantage of any incentives and programs that National Grid offers? (N=16)	
Response	**Number of Responses**
Yes	4
No	12

Question 21. What changes do you plan to implement in the next 6 months? (N=39)	
Response	**Number of Responses**
Attic Insulation	7
Wall Insulation	1
Basement Insulation	3
Door Sealing	1
New Windows	0
Air Sealing	1
New Refrigerator	1
New Furnace	3
Pipe Insulation	0
Other*	9

*Breakdown of other responses can be seen below

Question 21b. Breakdown of "Other" energy saving measures homeowners plan to implement in the next 6 months (N=9, multiple choices allowed)	
Response	**Number of Responses**
Install Thermostats	1
Ventilation/Install Fans	2
Attic Covers	2
New Hot Water Heater/Boiler	4
Behavioral Changes	1

Question 22. Were any of the recommendations unexpected or unforeseen to you? (N=39)	
Response	**Number of Responses**
Yes	9
No	21
Not Applicable*	9

* Homeowner did not receive any recommendations

Question 23. On a scale of 1 to 5 (1 is Waste of Time and 5 is Worth It) do you feel your assessment was worth the time commitment? (N=38)	
Response	**Number of Responses**
1	0
2	1
3	4
4	6
5	27

Question 24. Have you noticed any changes in your behavior since you have had an assessment? (N=16)	
Response	**Number of Responses**
Turn off lights	1
Thermostat settings	1
More clothing	0
Bedding	0
Not at all	14
Other	0

Question 25. Have you seen a noticeable reduction in your energy bill since having the assessment? (N=16)	
Response	**Number of Responses**
Yes	4
No	5
Don't Know	3
Too Soon To Tell	4

Question 26. After having an assessment, how you rate the efficiency of your home on a scale of 1 to 5 (1 is Not At All Efficient, 3 is Neutral and 5 is Extremely Efficient)? (N=16)	
Response	**Number of Responses**
1	0
2	1
3	6
4	5
5	4

Question 27. What is your overall satisfaction with your home energy assessment on a scale of 1 to 5 (1 is Not at All Satisfied, 3 is Neutral, 5 is extremely satisfied? (N=39)	
Response	**Number of Responses**
1	0
2	2
3	4
4	10
5	23

Question 28. Would you recommend this program to a friend/family? (N=38)	
Response	**Number of Responses**
Yes	38
No	0

Question 28b. Have you recommended this program to anyone? (N=38)	
Response	**Number of Responses**
Yes	29
No	9

Question 29. Did you learn about any new energy conservation techniques that you had not learned about previously? (N=38)	
Response	**Number of Responses**
Yes	6
No	32

Question 30. Are you aware that there is a surcharge for energy efficiency programs like your home energy assessment on your National Grid electricity bill? (N=39)	
Response	**Number of Responses**
Yes	17
No	22

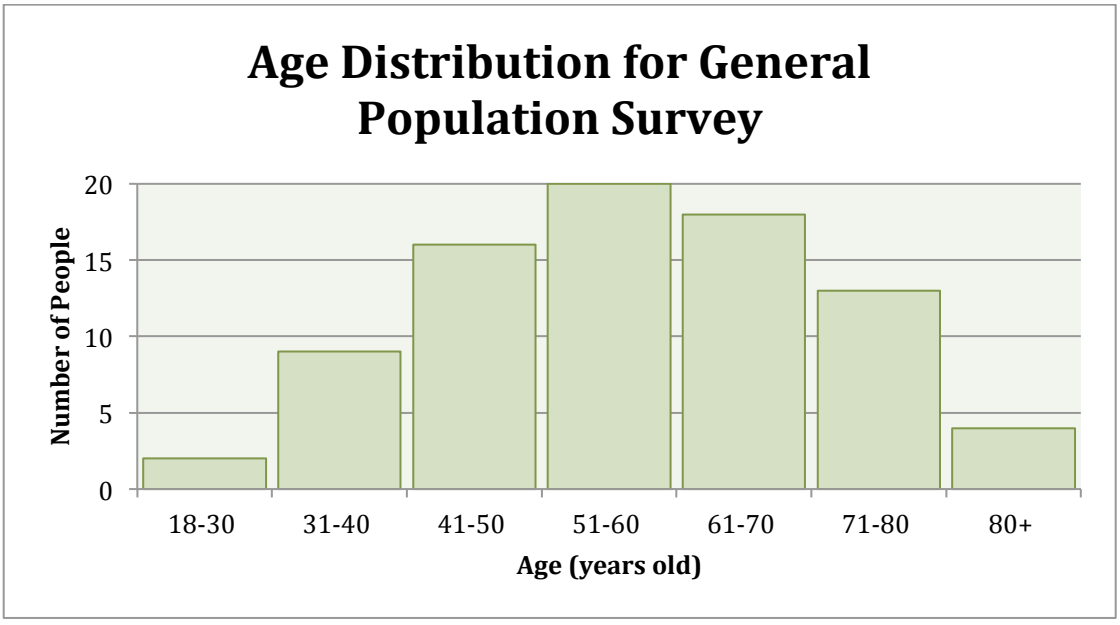
Question 31. What recommendations do you have to improve the program? (N=39)	
Response	**Number of Responses**
More Follow Up	3
More Information/education	7
More Time/Longer Audit	4
Increase Awareness/More Marketing	9
More Variety in Products (light bulb sizes and incentives)	5
No Recommendations	11

Appendix F – General Population Survey Results

Total Surveys collected = 97
From the dates: 11/5/2012 - 11/16/2012
All questions are multiple choice unless stated otherwise

Question 1. When are you at your Nantucket residence? (N=97)	
Response	**Number of Responses**
Year Round	92
Seasonal	5

Question 2. How old are you? (open-ended, N=97)	
Response	**Number of Responses**
18-30 years old	2
31-40 years old	9
41-50 years old	16
51-60 years old	20
61-70 years old	18
71-80 years old	13
80+ years old	4



Question 3. Where on the island is your residence located? (N=95)	
Response	**Number of Responses**
In-Town	22
Mid Island	44
Madaket	9
Siasconset	5
South Shore	6
Northern Shore	5
Tom Nevers	4

Question 4. Do you rent or own your place of residence? (N=97)	
Response	**Number of Responses**
Own	73
Rent	24

Question 5. Below are a series of statements. Please indicate how much you agree or disagree with each: (1 is Strongly Disagree, 3 is Neutral, 5 is Strongly Agree) (N=97)					
	1	**2**	**3**	**4**	**5**
I consciously try to save energy.	2	2	10	41	42
Nantucket residents need to do more to save energy.	3	3	19	31	41
The price of electricity on Nantucket is too high	2	2	28	21	44
My home is more energy efficient than most.	8	14	32	25	18

Question 6. Have you heard of any no-cost Home Energy Assessment (HEA)/Audit programs? (N=97)	
Response	**Number of Responses**
Yes	47
No	50

Question 7. What names or organizations do you associate with the program? (open-ended, N=47)	
Response	**Number of Responses**
National Grid/Utility Company	22
Mass Save Program	4
Lauren Sinatra/Nantucket Energy Office	2
Conservation Services Group	1
I Don't Know	17
Other	1

Question 8. How did you hear about the program? (Check all that apply) (N = 60)	
Response	**Number of Responses**
Word of Mouth	18
Mailing Insert	9
Newspaper	8
Email/Newsletter	5
Radio	5
Internet	2
I Don't Know	4
Other	9

Question 9. Do you know anyone who has had a Home Energy Assessment under the Mass Save Program? (N=47)	
Response	**Number of Responses**
Yes	26
No	21

Question 10. What percentage do you think homeowners can save on their electricity bill by having a Home Energy Assessment? (open-ended, N=97)	
Response	**Number of Responses**
<10%	25
11-20%	25
21-30%	24
31-50%	4
51-100%	4
I Don't Know/Blank	15

Question 11. How do you usually learn about programs and events in the community? (Check all that apply) (N=256)	
Response	**Number of Responses**
Newspaper	64
Word of Mouth	63
Internet	37
Emails/Newsletters	36
Radio	27
Fliers/Posters	21
Other	8

Question 12. Are you aware there is a person in the Town of Nantucket Energy Office who can help you set up a Home Energy Assessment? (N=97)	
Response	**Number of Responses**
Yes	33
No	64

Question 13. Did you know that you pay a surcharge in you National Grid electricity bill for energy efficiency programs like the Mass Save program? (N=97)	
Response	**Number of Responses**
Yes	36
No	61

Question 14. What do you know about any incentives offered by this program? (Open Ended, N=97)	
Response	**Number of Responses**
Yes	13
No	84

Question 15. What would most motivate you to make energy efficiency improvements in your home? (Check all that apply, N=151)	
Response	**Number of Responses**
Save Money	69
Save Energy	33
Help the Environment	28
I Am Already Motivated	19
Other	2

Question 16. In the future, would you be interested in having a Home Energy Assessment? (N=96)	
Response	**Number of Responses**
Yes, I plan to sign up	26
Yes, but I would need more information	45
No, I have already had one	19
No, I am not interested	6