EVALUATION OF NATIONAL GRID'S COMMUNITY PILOT PROGRAM

ENERGY ACTION: AQUIDNECK AND JAMESTOWN

Final Report

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NATIONAL GRID

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1. EXECUTIVE SUMMARY

The Aquidneck Island pilot (Aquidneck pilot) was a community-based energy efficiency pilot program implemented in the towns of Jamestown, Middletown, Newport, and Portsmouth, Rhode Island from July 2009 through December 2010. The purpose of the pilot was to increase energy efficiency savings from National Grid programs in a specific geography, by marketing existing residential and commercial programs through a unique community-based approach. The pilot was also an opportunity to examine whether customer-side solutions such as energy efficiency could address transmission and distribution system planning and reliability issues.

National Grid designed *Energy Action: Aquidneck & Jamestown* to package and market existing National Grid residential, municipal, and commercial efficiency programs to customers through community outreach channels.[1] The Program Administrator (PA) designed a community-based marketing campaign that focused on creating and maintaining community partnerships to help market efficiency programs. Two primary community groups received direct funding from National Grid to organize, promote, and implement community events and outreach: the Aquidneck Island Planning Commission (AIPC) and Neighborhood Energy Challenge (NEC). The PA also worked with the local Chamber of Commerce to design events that might attract local business leaders.

By creating partnerships with community organizations, the PA aimed to market the program through new and creative tactics such as sponsorships or contests, as well as traditional advertising. For example, AIPC conducted direct outreach and hosted energy-related events throughout the pilot period, including an Energy Breakfast for town officials and local business leaders. The NEC created a community-based energy-saving contest to encourage residents to track their energy use and find ways to reduce electricity, home heating fuel, and transportation fuel consumption. Community partners also coordinated press releases and editorials in local papers that highlighted upcoming *Energy Action* events and energy efficiency opportunities (e.g., an energy audit of the Mayor of Newport's home).

Additionally, the PA worked with the energy efficiency marketing team to brand the pilot program through a community-focused marketing campaign and website. The PA developed a unique brand for the Aquidneck pilot – *Energy Action: Aquidneck & Jamestown* – and used it on the website and in program marketing materials, such as newspaper advertisements, bill inserts, door hangers, and community event displays.[2] The PA sponsored the website and local advertising that promoted community events (e.g., a *Power to Save* night at local schools, and a contest for Newport Gulls baseball tickets). PA program staff also launched a "Main Streets" approach to small business outreach, going door-to-door with program materials to talk to small business owners about energy efficiency opportunities.

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[1] Electric and gas energy efficiency programs offered during the pilot were based on standard National Grid programs and incentives in Rhode Island, and relied on the same implementation staff that was responsible for implementing these programs elsewhere in Rhode Island.

[2] Community partners could use their own branding as well as *Energy Action* to promote energy efficiency opportunities.

Evaluation Objectives

This evaluation addresses two key questions: First, whether the community-based energy efficiency approach used in the Aquidneck pilot is a cost-effective method for increasing energy savings, and second, whether the Aquidneck pilot program approach is replicable as a geographically focused energy efficiency program strategy for increasing participation.

To address the first question, we use a quasi-experimental design approach to calculate net incremental impacts attributable to the pilot. These net incremental impacts become inputs to a Total Resource Cost test (TRC) that is based on the 2010 Rhode Island Benefit-Cost analysis tool.

To assess the second question, we consider two dimensions of replicability – first, whether the pilot program design is worth replicating as an energy efficiency strategy (for increasing participation and savings), and second, what pilot implementation tactics proved effective in driving pilot results. We then draw conclusions regarding what implementation tactics PAs could or should consider for other community-based programs.

Please note that this evaluation does not cover the pilot's effectiveness as a transmission and distribution (T&D) deferral strategy, though it does explore peak load changes at a high level, and discusses measurement and evaluation considerations for future assessment of T&D deferral benefits. Although the program was initially planned as a T&D deferral project in 2008, T&D planning efforts were not fully developed in 2008 when the Aquidneck pilot was planned. Therefore, the program continued as an energy efficiency project without setting T&D goals or establishing a measurement framework for tracking T&D deferral benefits during the program. Consequently, we were unable to definitively answer whether this type of program approach works as a deferral of T&D costs.

Pilot Cost-Effectiveness

The targeted, community-based marketing and outreach efforts were effective in driving incremental participation in both residential and commercial energy efficiency programs.[3] As Figure 1 shows, the pilot delivered incremental electric savings from energy efficiency programs, surpassing both the baseline savings level in Aquidneck and the increase that was expected based on a matched comparison groups' savings in the pilot period.[4,5] The pilot was cost-effective in delivering electric energy savings, with an overall Benefit-Cost ratio of 2.26.[6] The pilot did not have an impact on gas energy savings.[7]

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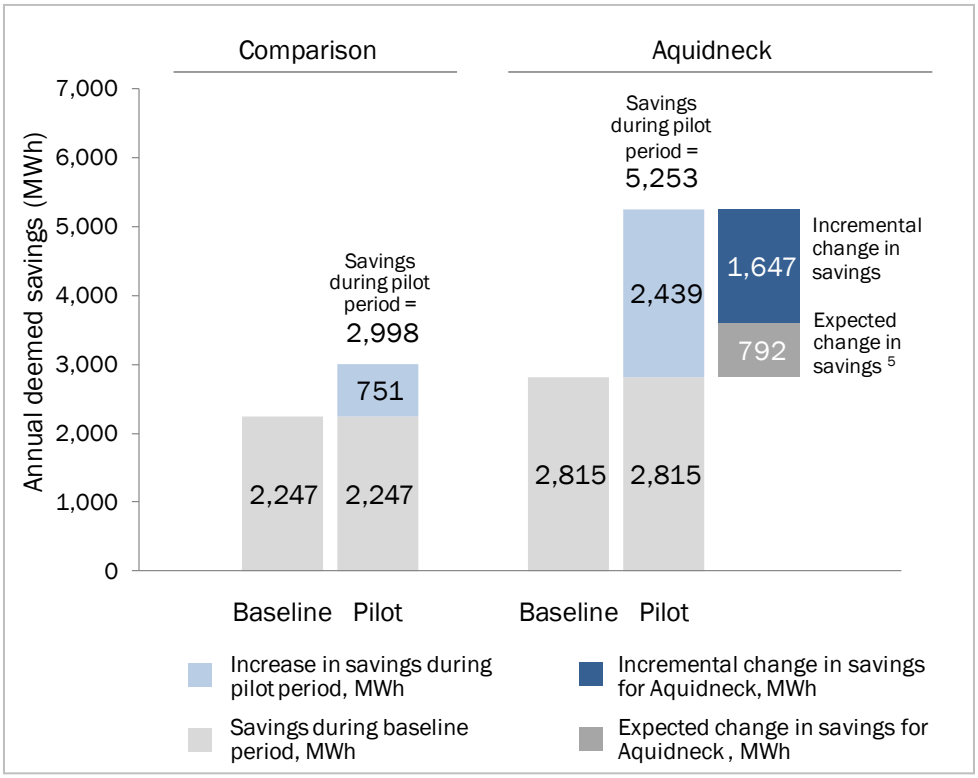
[3] The pilot targeted Small, Medium, and Municipal Commercial & Industrial customers. The pilot did not include marketing and outreach to C&I managed accounts, or Large C&I.

[4] Energy efficiency savings achieved from the same National Grid efficiency programs in comparison towns of Barrington, Warren, Bristol, Tiverton, and Little Compton served as a reference for estimating energy efficiency program savings we would expect in the Aquidneck region in the absence of the pilot.

[5] Expected change in savings for Aquidneck is equal to the increase in average savings per account in comparison towns in the pilot period versus the baseline period, multiplied by the number of customer accounts in Aquidneck. Section 2 of the final report describes methodology in more detail.

[6] The numerator of the Benefit-Cost ratio is total resource benefits from incremental program savings, i.e., avoided costs of capacity, energy, and non-electric benefits. The denominator is incremental program costs, which include standard program costs as well as pilot-specific implementation costs. For this calculation, pilot implementation costs exclude evaluation costs; with evaluation costs included, the Benefit-Cost ratio is 2.12.

Figure 1. Electric Impact from Pilot Program



The pilot's ability to deliver incremental electric energy savings from existing programs, with a relatively low implementation cost, drove its cost-effectiveness. Key achievements of the pilot that contributed to cost-effectiveness include:

- Commercial electric programs achieved 53.0% incremental savings during the pilot – in other words, 53.0% of the Aquidneck savings achieved from PA energy efficiency programs are above the savings level we would expect in the absence of the pilot.[8]
- Residential electric programs achieved incremental savings of 12.8% in Aquidneck during the pilot period, and residential gas programs achieved 15.2% incremental savings.
- *Energy Action* messages and information likely influenced between 20-25% of residential households that participated in a PA energy efficiency program during the Aquidneck pilot, to participate in a program.

Based on the Aquidneck pilot's success in delivering cost-effective incremental electric savings among both residential and commercial customers and feedback from program participants, we conclude that the variety of marketing and outreach activities implemented by National Grid and community-based partners a) succeeded in reaching potential

[7] While overall gas savings in Aquidneck during the pilot increased slightly above baseline savings, gas savings in the comparison group increased by a larger amount.

[8] Incremental savings are based on a difference-in-difference analysis of energy efficiency savings achieved during a baseline period and in a matched group of comparison towns.

participants, and b) influenced customers' decision to participate in energy efficiency programs. For these reasons, National Grid should consider similar program design elements for future energy efficiency programs.

Pilot Implementation Effectiveness

Key findings regarding the effectiveness of pilot implementation can help answer the question of how the pilot could be replicated. Here we summarize key findings from the process component of the Aquidneck pilot evaluation:

- Varying and repeating energy efficiency messages through different sources, channels, and brands was an effective method for reaching customers throughout the community.
- Mass media – including newspaper (stories, press releases, ads) and radio – provided the most effective outreach for generating awareness of *Energy Action* activities.
- The door-to-door "Main Streets" approach seemed to be effective for generating participation among small businesses, as Small C&I electric program activity increased substantially when door-to-door promotion ramped up.
- Early engagement of partner organizations and business leaders was useful in garnering support for the pilot and building program processes.
- Sharing feedback with stakeholders – including partner organizations – helped increase pilot effectiveness by enabling stakeholders to adapt approaches in response to success metrics.
- Building community partnerships and facilitating outreach through community organizations required more PA resources than anticipated – particularly staff time and in-person visits.
- Leveraging existing programs proved to be an effective strategy for delivering incremental savings and program participation, with incremental savings results described above.

In combination, the cost-effectiveness of the pilot, its success in generating incremental program savings, and our qualitative findings on the effectiveness of implementation methods indicate that the Aquidneck pilot model could be replicated in other communities.

Implications for Replicability

The Aquidneck pilot demonstrated that the community-based program strategy is worth replicating (due to its cost-effectiveness) and replicable (as a process), though the specific tactics may be difficult to replicate per se. Here we discuss a few considerations for PAs planning to replicate the Aquidneck pilot as a geographically focused energy efficiency program strategy for increasing participation.

Building community partnerships and facilitating outreach through community organizations requires staff resources as well as monetary investment. To optimize the use of PA resources for community-based efforts, PA staff should define the type of relationship they wish to have with community partners, and refine community partner selection and partnership agreements accordingly.

When designing a program with multiple stakeholders who share marketing responsibilities, we recommend maintaining a program strategy that allows for change based on input from community partners and ongoing feedback on successes and failures. This pilot demonstrated that it is important to hold program strategy and kickoff meetings early in the process with key community partners (and stakeholders) to begin building program processes, and empower stakeholders as early as possible.

In future community-based efforts, we recommend creating metrics to capture marketing effectiveness that can be shared with stakeholders and implementers, and developing processes to share these metrics in real time with partners and implementers. During the Aquidneck pilot, National Grid and community partners were able to modify tactics quickly in response to program participation feedback as well as marketing and outreach opportunities.

Finally, repeating similar messages that vary by source, channel, and brand is an effective method of reaching customers (based on customer recall and stakeholder feedback). For example, newspaper articles and press releases – such as a story about a community leader's home audit – proved effective in generating interest in energy efficiency programs. This pilot showed that it is not necessary to maintain tight control over brand and marketing tactics to generate incremental participation in energy efficiency programs.

2. OVERVIEW OF EVALUATION

National Grid engaged Opinion Dynamics Corporation to assess the cost-effectiveness and replicability of an innovative community-based pilot program. We calculated the cost-effectiveness of the pilot using a standard total resource cost test approved for use in Rhode Island. We examined the effectiveness of the pilot implementation in terms of driving incremental participation in existing energy efficiency programs. We also assessed program processes such as the engagement of community groups and marketing tactics. Given that future replication was an overarching goal of National Grid in implementing the pilot, we designed the evaluation approaches to share information about the effectiveness of the pilot that can help with future community-based program design.

We first discuss the program itself followed by our evaluation objectives and the methods used to answer research questions. Section 3 presents integrated findings.

2.1 Program Under Assessment

Energy Action: Aquidneck & Jamestown is a community-based pilot program designed to package and market existing residential, municipal, and commercial efficiency programs to customers through community outreach channels. The pilot began in July 2009. The purpose of the pilot was to increase participation in energy efficiency programs in a concentrated geographical area to investigate whether community-based initiatives increase energy efficiency program uptake (participation) and whether there are any transmission and distribution deferral benefits. The program fully integrated gas and electric, and commercial and residential programs under a community umbrella.

The pilot targeted residents, businesses, and municipalities in the towns of Jamestown, Middletown, Newport, or Portsmouth, Rhode Island. We chose the communities in 2008 based on their geographically constrained transmission and distribution networks and community interest. The customer base (in 2010) was 35,356 electric customers (30,162 residential and 5,194 non-residential) and 11,423 gas customers (10,033 residential and 1,390 non-residential).

Energy efficiency program offerings during the pilot are based on standard National Grid programs and incentives in Rhode Island, and rely on the same implementation staff that is responsible for implementing these programs elsewhere in Rhode Island.[9]

2.1.1 Pilot Program Design

The program focused on creating and maintaining community partnerships to help market the regular efficiency programs and on designing a community-based marketing campaign. The goal of program design was to increase uptake in the energy efficiency programs currently active in Rhode Island. Additionally, National Grid wanted to determine whether

[9] One exception to standard incentives: For municipal Whole Building Assessment customers, National Grid offered to waive fee of the business analysis study from what is usually a cost-sharing arrangement.

transmission and distribution deferral savings were possible from additional customer-side energy efficiency actions.

The Energy Action PA worked with other National Grid energy efficiency program administrators to achieve savings in the four pilot towns through additional marketing of existing efficiency programs to the communities. By creating partnerships with community organizations, the PA was hoping to identify new and creative ways to market the program through sponsorships and contests, as well as traditional advertising. Additionally, the PA worked with the energy efficiency marketing team to brand the pilot program through a community-focused marketing campaign and website.

Energy Action set savings goals relative to savings achieved through electric and gas programs in Aquidneck and Jamestown in 2008. The pilot's goals were to (1) triple 2008 electric savings among residential and commercial customers by the end of 2010, (2) triple residential gas savings by the end of 2010, and (3) maintain C&I gas savings at 2008 levels.[10] To track the program's savings goals, the PA monitored participation in most National Grid programs[11] in the four Aquidneck pilot towns and used Rhode Island approved savings assumptions for each measure within a program to estimate the total savings.

Table 1. 2008 Baseline Consumption and Pilot Goals

Fuel and Sector	2008 Baseline		Pilot Goals	
Electric	MWh Savings	% Savings	MWh Savings	% Savings
Residential	709.1	0.35%	2,088.5	1.03%
C&I	821.5	0.25%	3,681.7	1.10%
All Electric	1,530.6	0.29%	5,770.2	1.08%
Gas	MMBtu Savings	% Savings	Therm Savings	% Savings
Residential	152.3	0.01%	432.6	0.03%
C&I	6,104.6	0.29%	8,000.0	0.38%
All Gas	6,256.9	0.30%	8,432.6	0.41%

In 2009, the program leveraged the marketing budgets from Rhode Island energy efficiency programs. In 2010, the program received its own budget. Including marketing expenses, and community partner costs, the incremental cost of implementing the pilot was $165,798 over the duration of the pilot.[12]

[10] Because many larger gas C&I accounts participated in gas energy efficiency programs in 2008, the pilot set goals to levelize C&I savings rather than increase savings.

[11] Participation and savings were tracked in all RI programs except ENERGY STAR Homes, and large managed C&I accounts.

[12] Note that these incremental costs exclude evaluation costs, to illustrate what costs might be if the pilot were replicated.

2.2 Evaluation Objectives

The primary objective of this evaluation is to determine whether the community pilot program was a cost-effective strategy for increasing energy savings through participation in existing National Grid energy efficiency programs. National Grid is interested in whether energy efficiency programs marketed through the community continue to be cost effective under the Rhode Island TRC for both gas and electric programs after considering the additional marketing costs of the community outreach activities.

The secondary objective of this evaluation is to determine whether the Aquidneck pilot program approach is replicable as a geographically focused energy efficiency program strategy for increasing participation.

This evaluation also discusses evaluation considerations for future assessment of community-based programs that may have T&D deferral or substitution goals. Although the program was initially planned as a T&D deferral project in 2008, T&D planning efforts were not fully developed in 2008 when the Aquidneck pilot was planned. Therefore, the program continued as an energy efficiency project without setting T&D goals or establishing a measurement framework for tracking T&D deferral benefits during the program. Consequently, we were unable to draw conclusions on whether this type of program approach works as a deferral of T&D costs. Instead, we explore peak load changes at a high level, and discuss measurement and evaluation considerations for future assessment of T&D deferral or substitution benefits.

2.3 Study Method

2.3.1 Energy Impact and Cost-Effectiveness

Impact Analysis Approach

To determine the energy impact of the pilot, we used a quasi-experimental design approach. This approach compares two groups – the Aquidneck towns and a set of matched comparison towns – across two periods – the Pilot period and a Baseline period occurring before pilot implementation. This quasi-experimental design enables the calculation of net incremental impacts attributable to the pilot. These net incremental impacts are the basis of the Benefit-Cost analysis that we use to determine the cost-effectiveness of the pilot.

To assure equal footing with other energy efficiency program cost-effectiveness analyses, National Grid provided the evaluation team with a TRC analysis tool for 2010 Rhode Island Benefit-Cost calculations. We input incremental impacts into the model based on our comparative analysis, and National Grid provided pilot costs to enable the total resource cost test.

We define “incremental impact” as an increase in energy savings attributable to the pilot efforts, beyond the energy savings we would have expected in Aquidneck without the pilot. We applied a difference in differences approach to determine incremental impacts. First we compared gross energy savings from energy efficiency program participation in the

Aquidneck pilot region during the 18 months of the pilot efforts (pilot period)[13] with energy savings in the Aquidneck region during the 18 months before the pilot began (baseline period).[14] Second, we compared this difference in savings in Aquidneck between the pilot and baseline periods with the difference in savings in a matched comparison region between the same pilot and baseline periods. The incremental savings analysis compares combined program activity (savings across multiple programs) for the towns targeted by the pilot effort to savings from the same programs in the comparison region. This analysis essentially controls for natural trends, i.e., changes in program participation and savings that would have occurred even without the pilot. This is important because overall statewide goals for energy efficiency programs in Rhode Island increased in 2009 and again in 2010.

A key part of this analysis is the matched comparison group. The comparison group consists of Rhode Island towns that are similar to the Aquidneck region in demographic, housing, and customer characteristics, and had been exposed to the same energy efficiency programs but were not exposed to the additional National Grid energy efficiency marketing and outreach offered through the pilot.

We included the towns of Barrington, Warren, Bristol, Tiverton, and Little Compton in the comparison group. We selected these based on similarities with the pilot towns with respect to:

- Total population
- Geography (they are all island or peninsular towns, like the four pilot towns)
- Demographics (the comparison group has similar household income levels, but slightly lower education levels)
- Housing (the comparison group has a higher owner-occupancy rate and share of single-family homes).[15]

We also considered the availability of National Grid gas service in these towns, and included Little Compton to balance Jamestown, neither of which have National Grid gas service. The table below provides key characteristics for the pilot towns and the comparison group. While income, education, and single-family home occupancy are fairly similar between the groups, owner occupancy is lower in the Aquidneck region due to the inclusion of Newport, which has a lower owner occupancy rate than most Rhode Island towns. We note that this difference in owner occupancy may affect the ability of residents to take advantage of rebate and installation-based energy efficiency programs.

[13] 7/1/2009 to 12/31/2010

[14] 1/1/2008 to 6/30/2009

[15] Demographic and housing comparability of Aquidneck and comparison group towns was based on US Census data from the 2000 Decennial Census, as updated data at a town level was not available when we made our initial selections. Here, we show the more recent data – from the 2005-2009 American Community survey – to demonstrate the current comparability of the two groups. Data from the 2000 Census is shown in the Appendix.

Table 2. Demographic and Customer Characteristics of Aquidneck and Comparison Groups, 2005-2009

Characteristics	Aquidneck Pilot Towns	Comparison Group
Community Characteristics[a]		
Total population	63,061	68,654
Total households	26,470	26,510
Median household income (wgtd. average)	$ 65,711	$ 68,878
% Adults 25+ with Bachelor's Degree or higher	46%	38%
% Owner-Occupied Housing Units	60%	75%
% Single-Family Housing Units	63%	75%
Customer Characteristics[b]		
Residential Electric Customer Accounts	30,162	30,146
Residential Gas Customer Accounts[c]	10,033	12,318
Commercial Electric Customer Accounts	5,194	3,386
Commercial Gas Customer Accounts[c]	1,390	1,077

[a]Source: US Census American Community Survey 2005-2009 5-year estimates, [b]Source: National Grid Customer Account System (2010 Customer Accounts), [c] Number of gas customer accounts in 2010.

Programs Under Evaluation

To estimate electric and gas savings from each region – Aquidneck and comparison – in each period – Pilot and Baseline, we compiled all energy efficiency program participant data from residential and commercial programs that were promoted in the Aquidneck region during the pilot.[16] We classified each participation record in each energy efficiency program as occurring in the baseline vs. pilot period based on the same date fields that National Grid uses to classify participation in a certain year (e.g., invoice date).

Table 3. summarizes the program participation data we included in the cost-effectiveness analysis. All programs were available in the comparison communities and Aquidneck communities during the evaluation period. All but one measure (the refrigerator recycling measure in the ENERGY STAR® program) were available for the duration of the evaluation period.[17]

[16] Upstream lighting measures are excluded from analysis as program tracking does not enable attribution of rebates to the pilot vs. comparison region. Very Large C&I (over 750 kW) and managed accounts are also excluded from analysis, as they were not part of the pilot effort.

[17] Refrigerator recycling became available during the pilot period. We keep the refrigerator recycling measure in analysis because it was a focus of incremental marketing and outreach activities, and it was available in the comparison communities during the same time period.

Table 3. National Grid Energy Efficiency Program Included in Cost-Effectiveness Analysis

Program	Sector[a]	Aquidneck		Comparison	
		Baseline Period	Pilot Period	Baseline Period	Pilot Period
National Grid Electric Programs					
Design 2000plus	C	X	X	X	X
Energy Initiative	C	X	X	X	X
Small and Medium Business Applications	C	X	X	X	X
EnergyWise (Single-Family and Multi-Family)	R	X	X	X	X
ENERGY STAR® Lighting (Coupon and Ordered)	R	X	X	X	X
ENERGY STAR® Appliances	R	X	X	X	X
Appliance Recycling	R		X		X
ENERGY STAR® Air Conditioning	R	X	X	X	X
National Grid Gas Programs					
Commercial Energy Efficiency Program (Custom)	C	X	X	X	X
Commercial High Efficiency Heating (Prescriptive)	C	X	X	X	X
High-Efficiency Heating Equipment (HEHE)	R	X	X	X	X
EnergyWise (Single-Family and Multi-Family)	R	X	X	X	X

[a] C=Commercial, R=Residential

Incremental Savings Calculation

We performed a comparison of the kWh and therm savings between the pilot and comparison groups to determine the incremental savings associated with the pilot. Because the pilot and comparison groups are different in terms of numbers of accounts, the comparisons must be normalized by the number of accounts; therefore, we used average savings per account as the unit of comparison. For example:

Assume the Aquidneck group (A) includes 35,000 accounts.
Assume the comparison group (C) includes 33,000 accounts.

Assume Aquidneck kWh savings (A) to be:

$$\text{Baseline}_A = 2{,}250{,}000/35{,}000 = 64.3 \text{ kWh/acct}$$
$$\text{Pilot}_A = 3{,}000{,}000/35{,}000 = 85.7 \text{ kWh/acct}$$

Assume comparison group kWh savings (C) to be:

$$\text{Baseline}_C = 2{,}150{,}000/33{,}000 = 65.2 \text{ kWh/acct}$$
$$\text{Pilot}_C = 2{,}600{,}000/33{,}000 = 78.8 \text{ kWh/acct}$$

The change in savings for each is:

$$\Delta \text{ Savings}_A = 85.7 - 64.3 = 21.4 \text{ kWh/acct}$$
$$\Delta \text{ Savings}_C = 78.8 - 65.2 = 13.6 \text{ kWh/acct}$$

In this example, the incremental savings attributable to the pilot are 21.4 – 13.6 or 7.8 kWh/acct. Without the pilot, we would have expected to see an increase in energy savings of 13.6 kWh/account in the pilot group (or 477,273 kWh of savings [13.6*35,000]). Instead, we saw a 750,000 kWh increase in savings, of which 272,727 kWh is due to the program. In this example, we take 272,727 kWh as incremental savings and 9.1% as the percentage of savings that are incremental [272,727 kWh due to program / 3,000,000 kWh gross savings].

We then apply the incremental percentage savings (e.g., 9.1%) for the pilot as a whole to gross savings from each energy efficiency program measure in Aquidneck in the pilot period to estimate incremental savings from each program measure, so that we can use these incremental savings values to calculate the total resource benefit attributable to pilot efforts.[18,19] We must apply incremental percentage savings to each program measure because the Total Resource Benefit-Cost Test model (described below) requires inputs at a measure level.

While the comparison group is not the entire population of Rhode Island, we are working with population data within the two groups. As such, there is no precision or sampling error involved in our calculations. Our analysis produces a point estimate with no error bound.

Cost-Effectiveness Test

Cost-effectiveness analysis replicates the Rhode Island Total Resource Benefit-Cost Test (B/C Test) used to evaluate the program year cost-effectiveness of National Grid's portfolio of electric and gas programs in Rhode Island. Total Benefits are the avoided costs of capacity, energy, and non-electric benefits. The standard B/C test is calculated as:

$$B/C\ Ratio\ = \frac{Total\ Benefits}{Implementation\ Expenses\ +\ Customer\ Contribution\ +\ Evaluation\ Cost\ +\ Shareholder\ Incentive}$$

To calculate an incremental B/C ratio, we modified this calculation to reflect the total benefits of incremental savings and the total cost of generating those incremental energy savings. The incremental B/C test is:

$$Incremental\ B/C\ =\ \frac{Benefits\ from\ Incremental\ Program\ Savings}{(Standard\ Program\ Cost\ per\ kWh\ *\ Incremental\ kWh)\ +\ (Aquidneck\ Pilot\ Implementation\ Cost)}$$

The table below describes the components of this formula, with more information available in Appendix A. All benefits and costs are normalized to 2010 dollars.

[18] Determination of the incremental change in savings by specific measures or programs is not practical given the false precision it implies (especially for smaller programs), since we expect some natural variation in measure mix between regions and time periods (that may not be related to pilot influence). As such, we distribute the incremental savings rate estimate across all measures and programs evenly to reflect overall pilot influence.

[19] For example, if our analysis estimates a 5% incremental increase in total savings, 5% of the total lighting savings for the pilot towns will be used within the cost-effectiveness screening model, as will 5% of the total HVAC savings, etc.

Table 4. Inputs to Cost-Effectiveness Calculation

Components	Description
Incremental Benefit (2010 Dollars)	
Total Resource Benefit from incremental savings	Calculated 2010 Rhode Island Electric and Gas Screening Models, with incremental kWh and therms as inputs.
Electric Benefits	
Gas Benefits	
Incremental Cost (2010 Dollars)	
Standard cost to generate incremental savings	Based on average per kWh or MMBtu costs of implementation, customer contribution, shareholder incentive, and evaluation for each program, weighted by the proportion of energy savings from each program in the Aquidneck pilot. Applied to incremental kWh and MMBtu only.
2009 Electric Costs	
2010 Electric Costs	
2009 Gas Costs	
2010 Gas Costs	
+ Incremental cost of implementing pilot	Marketing, community and partnership and expenses specific to pilot
Pilot-specific implementation Costs	

Incremental benefits are the total resource benefit of incremental energy savings achieved by the Aquidneck pilot, based on savings approved in the 2010 Rhode Island Energy Efficiency Program Plan. The electric and gas screening models use assumptions about each measure to determine avoided capacity, along with monetary value associated with avoided capacity and resource costs. Incremental costs include the costs of generating each incremental unit of energy savings under standard programs, as well as pilot-specific implementation costs such as marketing expenses and community partnerships.[20]

The analysis combines 2009 and 2010 into a single pilot period to obtain a single cost-effectiveness value for the pilot. Performing the analysis on a year-by-year basis could lead to misleading results as some installations associated with first-year marketing efforts might not happen until the second year; therefore, incremental savings must pool savings from the 18 months of each period (baseline and pilot). We the calculate savings per customer account using a weighted average number of customers in each region and period.[21] To generate pooled incremental costs, we weight standard program costs (average costs per kWh or MMBtu) from 2009 and 2010 by the proportion of pilot savings in Aquidneck occurring in each year. This allows us to account for slight differences in program implementation costs from year to year.

[20] For the purpose of the B/C ratio calculation, we exclude evaluation costs from Incremental Costs to enable comparison of the B/C ratio to other programs that may not have separate evaluation budgets.

[21] Given slight differences in the number of gas customer accounts per year, we calculate a weighted average number of customers for the baseline period and the pilot period – for example, the 2009 customer count was weighted by 1/3 and the 2010 customer count by 2/3 to estimate the weighted average number of customer accounts in the pilot period (6 months in 2009 and 12 months in 2010).

2.3.2 Process Evaluation

We conducted a limited process evaluation to assess whether the pilot is replicable and scalable, two of National Grid's goals when implementing this pilot. We explored which activities worked well from the perspective of program stakeholders and participants, which activities did not work as well, and potential barriers to replicability and scalability. In addition to examining customers' perspectives on and satisfaction with the pilot effort, we explored which pilot-specific outreach activities participants recalled and if these outreach activities motivated participants to take energy-saving actions.

To inform qualitative analysis and prepare for discussion with stakeholders and participants, we reviewed pilot program materials, such as program planning documents, program goals, marketing and outreach collateral (e.g., press releases, ads, website screenshots, event materials, and photos), and preliminary lead tracking reports.

Program Stakeholder In-Depth Interviews

We conducted in-depth interviews with five program and implementation staff and two key community group leaders in December 2010. These interviews addressed what stakeholders saw as the objectives of the pilot: stakeholder perceptions of pilot replicability, barriers to replicability, most and least successful marketing and outreach activities, key challenges in implementation, and recommendations for future efforts. Interviews also explored how effective the engagement of community groups was during the pilot, and what lessons could be applied to future initiatives that might engage community partners.

Residential Participant Survey

To understand the reach and influence of the pilot on energy efficiency actions in the pilot area, we conducted a telephone survey of residential customers who lived in the pilot towns and participated in National Grid energy efficiency programs during the pilot period. We administered this telephone survey in January 2011. We completed 71 surveys of residential participants in National Grid energy efficiency programs who lived in the pilot communities and participated in a program between January and October 2010. The survey asked customers how they heard about the energy efficiency program they participated in; their general opinion of and satisfaction with National Grid; what they recalled about Energy Action messages; and how Energy Action messages influenced their knowledge of energy efficiency opportunities, motivations to take action, and opinions of National Grid. We recruited the telephone survey sample in proportion to participation records from Aquidneck in the same period. Nearly 40% of survey respondents received a home energy audit during this period. Table 5. shows the distribution of program participation in the survey sample.

Table 5. Energy Efficiency Residential Program Participation of Survey Respondents

Program	Percentage of Participant Records	Percentage of Survey Respondents	Survey Respondent n
EnergyWise (Single-Family and Multi-Family)	33%	38%	27
ENERGY STAR® Appliances	25%	25%	18
Appliance Recycling	17%	17%	12
ENERGY STAR® Lighting (Coupon and Ordered)	20%	14%	10
ENERGY STAR® Air Conditioning	3%	3%	2
High-Efficiency Heating Equipment (HEHE)	2%	3%	2
Total	**100%**	**100%**	**71**

2.3.3 Energy Efficiency as T&D Deferral Strategy

In the absence of baseline and pilot period demand data, we used qualitative analysis to evaluate the potential effectiveness of energy efficiency community-based programs as a T&D deferral strategy. We conducted interviews with National Grid staff familiar with the capital planning process. We also collected usage data for the relevant substations and circuits to develop a high-level assessment of peak load reductions after the implementation of the pilot.

3. KEY FINDINGS

The key questions for this pilot evaluation are whether the pilot is a cost-effective way to increase participation and the degree to, and circumstances under which the pilot is replicable. Three dimensions of a pilot determine whether it is replicable:

1) Is the pilot worthwhile to replicate as an energy efficiency strategy? In other words, do the incremental costs and benefits justify the effort?

2) What elements of the pilot could or should be replicated? In other words, what worked and what didn't work?

3) Is the pilot worthwhile to replicate as a T&D deferral strategy?

We divide our findings into three sections in line with these three questions. The first section – Impact and Cost-Effectiveness – summarizes the incremental impact of the pilot in terms of energy savings, and the cost-effectiveness of the pilot. The second section – Process Findings – summarizes program stakeholders' feedback on program design, marketing and outreach, and the influence of pilot activities on program participants' decision to participate in a National Grid energy efficiency program. The third section – Energy Efficiency as T&D Deferral Strategy – discusses measurement and evaluation considerations for other community-based program PAs that may wish to prove the effectiveness of community-based programs as either T&D deferral or substitution strategies (e.g., Non-Wires Alternatives).[22] Because the Aquidneck pilot developed as an energy efficiency project without establishing a framework for measuring T&D benefits during the program, this evaluation cannot draw conclusions about its effectiveness as a T&D deferral strategy.

3.1 *Impact and Cost-Effectiveness*

3.1.1 Incremental Energy Savings

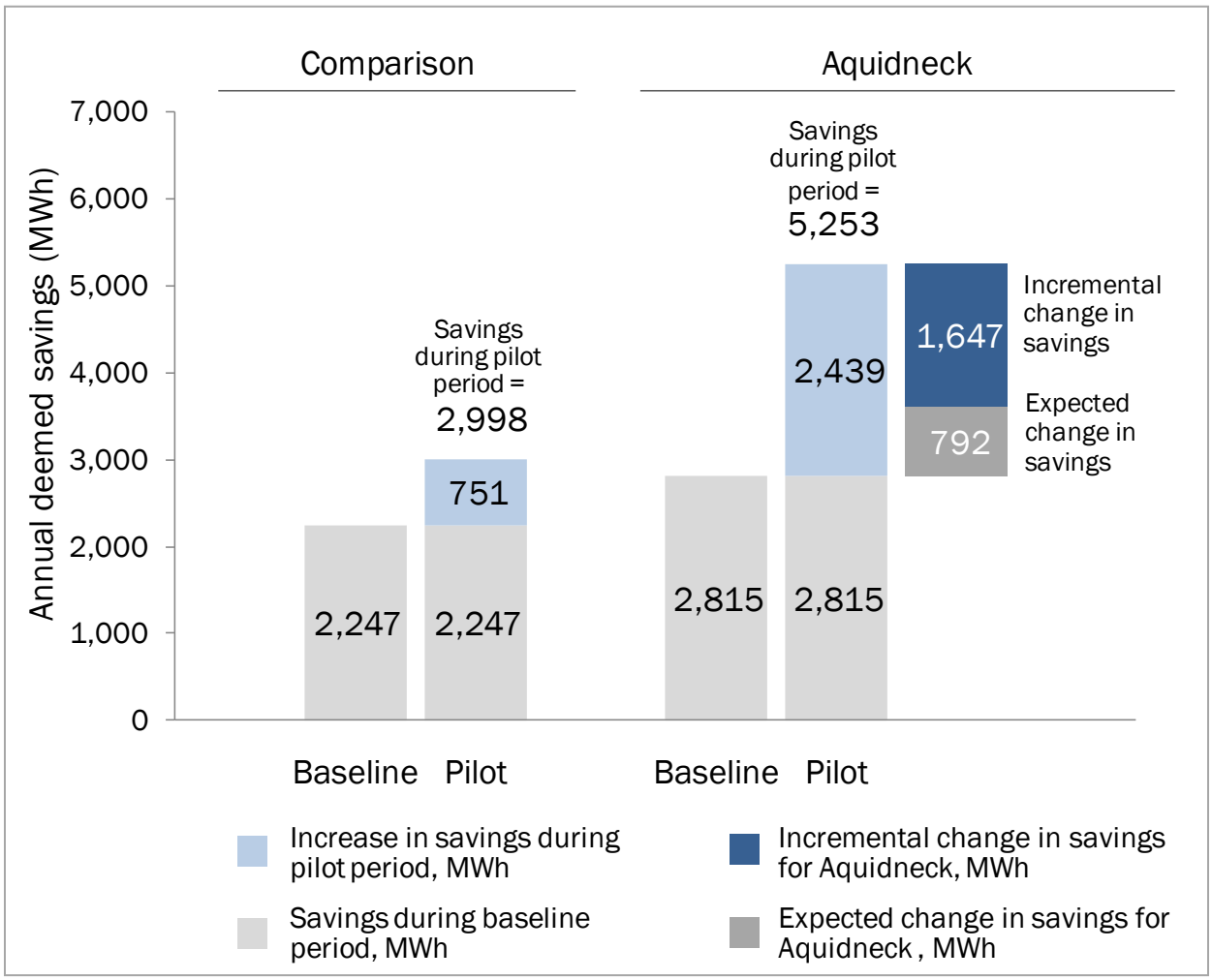
To calculate incremental savings, we first normalized total deemed savings in each time period (baseline and pilot) for each group of communities (comparison and Aquidneck) to the number of customer accounts in each group of communities. We calculated normalized deemed savings values separately for electric and gas programs. For gas programs, the number of customer accounts increased between 2008 and 2010 in both the comparison group and Aquidneck, so normalized deemed savings values in each period account for the number of customer accounts present in each time period. We then calculated the change in deemed savings (again, normalized by number of customer accounts) between the pilot period and baseline period. The change in savings achieved in the comparison communities is the change we would have expected Aquidneck communities to achieve in the absence of the pilot effort. Any additional increases in deemed savings in Aquidneck beyond what the comparison communities achieve can be considered incremental savings, and attributed to

[22] Non-Wires Alternatives (NWAs) can be thought of as any combination of energy efficiency, demand response, distributed generation, demand management, or other peak demand-targeting strategies that defer or substitute for the need for capital improvements to the transmission and distribution infrastructure.

the pilot. Finally, we calculated total incremental savings attributable to the pilot as the incremental savings per customer account multiplied by the number of customer accounts in Aquidneck during the pilot period.

The Aquidneck pilot achieved 1,647 MWh of incremental savings from electric energy efficiency programs. Figure 2 shows that energy savings increased by 2,439 MWh in Aquidneck during the pilot, compared with the baseline period. Of this increase in savings, 1,647 MWh is attributable to pilot efforts, as an increase of 792 MWh was expected given the increase seen in the comparison communities. Incremental savings for the Aquidneck pilot represent 31.4% of total savings (5,253 MWh) generated by electric energy efficiency programs in Aquidneck during the pilot period.

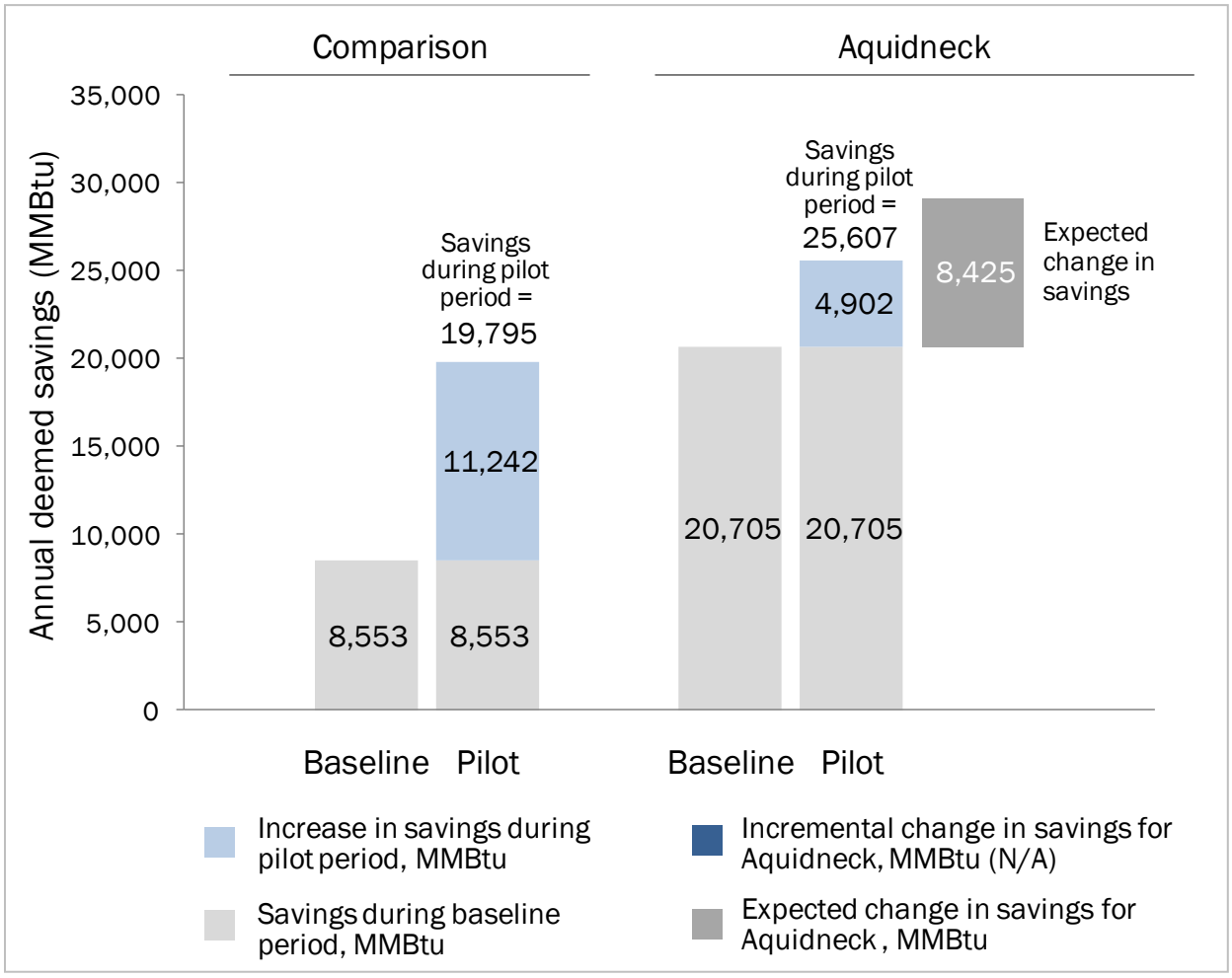
Figure 2. Change in Electric Deemed Savings between Baseline and Pilot Periods, Aquidneck and Comparison Communities



The Aquidneck pilot did not achieve incremental savings from gas energy efficiency programs. Figure 3 shows that energy savings increased by 4,902 MMBtu in Aquidneck during the pilot, compared with baseline period savings of 20,705 MMBtu. However, we would have expected an increase in savings of 8,425 MMBtu during the pilot period, based

on the average savings per account achieved in the comparison communities and the number of gas accounts in Aquidneck.

Figure 3. Change in Gas Deemed Savings between Baseline and Pilot Periods, Aquidneck and Comparison Communities



The smaller increase in Aquidneck C&I gas savings between periods – relative to the comparison group - is likely related to an uptick in broad C&I gas program activity in Aquidneck prior to the pilot period. Trended analysis of gas savings by sector – provided in Section 4 – shows a substantially higher baseline level of C&I savings for Aquidneck relative to the comparison group. According to program stakeholders, some larger C&I accounts participated in gas energy efficiency programs in 2008 and early 2009, leaving more limited potential for savings among remaining gas customers. For this reason, the PA established lower pilot savings goals for gas C&I compared with other sectors (Table 1.). The pilot succeeded in reaching its gas C&I savings goal of 8,000 MMBtu, with 12,253 MMBtu of annual savings from gas C&I programs during the pilot. Because overall gas savings in the Aquidneck region during the pilot did not exceed the level of savings we expected, we cannot calculate incremental gas benefits from the Aquidneck pilot.

3.1.2 Cost-Effectiveness of Pilot

The Aquidneck pilot was cost effective, with an overall Benefit/Cost ratio of 2.26. The cost of generating incremental energy savings in Aquidneck through the pilot was $1,216,894, while the total resource benefit from the incremental impact of the pilot is $2,748,999.

Table 6. Cost-Effectiveness Calculation and Benefit/Cost Ratio

Component	Value (2010 Dollars)
Incremental Benefit	
Total Resource Benefit from incremental savings	
Electric Benefits	$ 2,748,999
Gas Benefits	$ -
Total Incremental	*$ 2,748,999*
Incremental Cost	
Standard cost to generate incremental savings	
2009 Electric Costs	$ 305,894
2010 Electric Costs	$ 745,201
2009 Gas Costs	$ -
2010 Gas Costs	$ -
+ Incremental cost of implementing pilot[23]	
Implementation Costs	$ 165,798
Total Incremental Cost	*$ 1,216,894*
Benefit-Cost Ratio	**2.26**

In the absence of incremental gas savings, the overall Benefit-Cost test for the pilot as a whole is based only on the benefits associated with incremental savings from electric programs, compared with the costs associated with delivering those incremental savings (a standard program cost per kWh), and the cost of implementing the pilot as a whole.

3.1.3 Cost-Effectiveness Implications

Based on this analysis, the pilot was cost effective, and therefore worthy of replication in other areas. One area that National Grid could continue to monitor is the sustainability of savings following the program intervention, to determine whether program participation after the pilot remains at pilot levels. This may help determine the depth and duration of enhanced community-based efforts that are required to deliver measurable incremental savings.

[23] Incremental costs exclude evaluation costs. With evaluation costs included, the B/C ratio would be 2.12.

3.2 *Process Findings*

3.2.1 Effectiveness of Program Design

Community Group Engagement

National Grid energy efficiency and marketing staff worked with multiple community groups to encourage participation in National Grid energy efficiency programs in the pilot region. National Grid provided direct funding to two primary community groups to organize, promote, and implement energy-related community events and outreach throughout the pilot period. National Grid also worked with the local Chamber of Commerce to design events that might attract local business leaders. The two primary groups were effective in connecting with other local groups to promote National Grid energy efficiency programs in local media at multiple community events.

The main community partner, the Aquidneck Island Planning Commission (AIPC), was an established organization – a municipal planning commission – before the Aquidneck pilot. The AIPC was contracted to create and coordinate energy efficiency events for municipal leaders and residential customers. For example, they reached out to town officials to have their homes audited, met with school leaders to discuss National Grid's "Power to Save" educational campaign, and set up tables at numerous community evens to promote Energy Action. They were also responsible for media and press coverage of events they set up.

A second community partner organization was the Neighborhood Energy Challenge (NEC), a grassroots citizens group that formed around the time that the pilot launched to encourage and help residents to save energy. The NEC created a community-based energy-saving contest – also called the Neighborhood Energy Challenge – to encourage residents to track their energy use and find ways to reduce electricity, home heating fuel, and transportation fuel consumption. The NEC conducted in-person outreach and coordinated public relations (PR) to raise awareness of energy issues on Aquidneck Island and promote the contest.

There were benefits and challenges to working with both organizations, suggesting that future community-based programs should consider multiple types of organizations for potential partnerships. Based on this pilot, we do not believe that community partner organizations must necessarily be well established before forming an alliance. Other criteria to consider when choosing partner organizations include the organizations' motivation and ability to leverage community connections, existing member or customer lists, ability to leverage outside funding sources, staff time and commitment to the partnership, and their ability to balance National Grid program objectives with the organization's existing mission or agenda.

Community Group Communication

The utility and community group partnership represents a new kind of partnership that requires some capacity building, as partners work to identify community leaders, form working groups, establish responsibilities, etc. National Grid program staff felt that all community partners required more interaction and contact with National Grid than anticipated during program planning. The program ended up being more top-down than the

program manager expected. Community partners appreciated this frequent contact, planning sessions with National Grid, and joint decision-making, and seemed to want even more communication with National Grid.

Program design – both in National Grid's interaction with community partners, and in marketing activities – changed and evolved throughout the 18-month duration of the pilot. Activities changed in response to successes and failures, new opportunities (such as community events), and community partner suggestions. Future community-based programs should anticipate that program design changes will arise while working with community groups, and program design should allow enough flexibility to respond to opportunities and results.

During the Aquidneck pilot, program implementers received useful, real-time feedback on audit requests for residential and Small C&I energy audits. This real-time feedback allowed implementation staff to link marketing activities – such as radio ads, press releases, or contests – to upticks in audit requests, and modify marketing tactics based on the relative success of different tactics. Program implementers and stakeholders also received periodic feedback on progress against National Grid energy savings goals.

However, staff received more limited feedback on participation in other programs – particularly lighting and appliance rebates as well as refrigerator recycling – which were highlighted at local events and in local media. Additionally, not all program stakeholders received feedback on other rebate-type program participation at the same time. Improved feedback on participation in multiple types of programs may have led to different or earlier course changes in marketing tactics.

Future community-based efforts may want to consider other mechanisms for providing regular feedback on energy efficiency rebate participation to community-based stakeholders so they can modify tactics based on real-time results. Regular updates on program participation and progress against savings goals can help re-focus community partners on the right sectors and customer groups for outreach.

In the Aquidneck pilot, partner organizations were expected to coordinate and implement a certain number of community events, but given that the Aquidneck effort was a pilot in working with community-based organizations, partner organizations were not responsible for meeting specific, quantifiable participation goals. Future community-based programs may want to consider what type of accountability partner organizations should have for reaching specified goals and how to track those metrics.

3.2.2 Effectiveness of Program Marketing

Our findings on program marketing effectiveness are based on the results of a residential participant survey, stakeholder interviews, and review of program data. Please see section 4.3 for more detailed findings from the residential participant survey.

Branding and Messaging

National Grid developed a unique brand for the Aquidneck pilot – Energy Action – that associated National Grid energy efficiency programs with the community. National Grid used

the Energy Action brand on program marketing materials, specifically direct outreach, newspaper advertisements, bill inserts, and at community events.

While the PA encouraged community partners to use the Energy Action brand and logo, not all of the marketing efforts conducted by community partners focused on the National Grid or Energy Action brand. Community partners used their own branding and logos of their partner organizations to promote energy efficiency opportunities.

From the program stakeholders' perspective, the use of multiple brands and voices for energy efficiency messages was an effective strategy for increasing awareness of energy efficiency and knowledge of energy-saving opportunities. Having the same message coming from multiple brands – including trusted local organizations – may have helped the Energy Action message to reach more households and businesses than if program messages had originated solely from National Grid materials.

The multiple organizations and brands involved in promoting the pilot resulted in more varied messages. For example, while program messages focused on saving energy and money on utility bills, some messages from community groups took a broad approach to energy and environmental issues highlighting CO_2 emissions, rising sea levels, and transportation energy costs as reasons to save energy. Other messages gave people specific actions to take (like refrigerator recycling or purchasing a power strip). Program stakeholders felt that this varied repetition of messages worked well, given residents' many motivations to save energy. Still, some stakeholders felt that messaging more focused on saving money could have generated even greater interest.

Based on our evaluation of the Aquidneck pilot through the end of the pilot period (December 2010), it is unclear whether there will be a long-term effect of intensive, varied energy efficiency messages in the pilot communities. However, community partners plan to continue their energy efficiency efforts beyond the pilot, by seeking other funding sources.

Awareness and Influence of Energy Action Messages

Program participants surveyed for this evaluation had moderate awareness and recall of Aquidneck pilot marketing and outreach efforts. Energy Action messages likely influenced up to one-quarter of residential program participants to participate in National Grid energy efficiency programs. This influence rate is in line with residential incremental savings – about 13% of all residential electric savings and 15% of all residential gas savings in Aquidneck during the pilot period can be considered incremental (**Error! Reference source not found.**). Participant survey findings suggest that incremental energy savings may have been due to Energy Action marketing efforts.[24]

Key findings from participants were:

- Over one-third of residential energy efficiency program participants were aware of the Energy Action initiative.

[24] Though participant survey findings (regarding the influence of the pilot on participation decisions) and the presence of incremental savings from residential findings align (i.e., incremental program savings are coincident with incremental marketing), we cannot infer causality.

- Energy Action messages and information likely influenced up to one-quarter of participants to participate in a National Grid energy efficiency program.
    - Energy Action information influenced the participation decision of nearly one-quarter (23%) of the respondents.
    - About 20% of participants recalled hearing about their program through a marketing channel specific to Energy Action. Considering that some marketing channels were used to promote Energy Action as well as standard programs (e.g., bill inserts, direct mail), more than 20% of participants may have heard about their program through Energy Action marketing tactics.
- People who recalled Energy Action messages may have been more attuned to energy efficiency messages and opportunities prior to the pilot.
    - Nearly all (92%) of the EnergyWise home audit participants who had Energy Action awareness said they knew about National Grid energy efficiency programs prior to 2010.
    - One community partner stakeholder felt that the NEC contest seemed to attract people who had taken energy-saving actions in the past.
- Satisfaction with National Grid (at the time of the participant survey) was the same for participants with and without awareness of Energy Action.
    - Still, almost one-quarter of program participants with awareness of Energy Action reported an increase in opinion of National Grid since learning about Energy Action (23%).[25]

Effective Marketing and Outreach Tactics

- Early engagement of local officials and business leaders was thought to be useful in garnering support for the pilot.
    - Early in the pilot, program staff and the Aquidneck Island Planning Commission organized an Energy Breakfast for town officials, local business leaders, National Grid program staff, and National Grid account executives. Program stakeholders feel that this particular event was effective in sharing information about the pilot – specifically what National Grid was doing to help save energy in the community, and how local groups could help. Future community-based programs may want to consider organizing similar events with community leaders from the public and private sectors early in program implementation.
- Mass media provided the most effective outreach for residential customers
    - Newspaper stories, articles, and press releases had the broadest reach among participants in the pilot area - more than two-thirds (69%) of program participants

[25] Changes in opinion of National Grid since learning about Energy Action cannot be solely attributed to Energy Action, because more than one-quarter of all program participants reported an increase in opinion of National Grid as a result of participating in an efficiency program (29%), and changes in opinion could be due to the joint effect of efficiency program participation and Energy Action messages. Changes in opinion due to program participation were the same for participants with and without awareness of Energy Action.

with Energy Action awareness recalled seeing or hearing about Energy Action in a newspaper or magazine.

- Program staff and community partners also felt that media for the pilot – particularly press releases and ads in local media outlets – was effective in driving awareness of the pilot. Program staff saw a notable increase in home audit leads after a press release highlighting a home energy audit at the Mayor of Newport's home.
- Program staff saw an increase in leads during the Newport Gulls contest, which was promoted via radio, newspaper, direct mail, and bill stuffers. The contest required customers to schedule a home energy audit to be eligible for free baseball tickets.

➢ While commonly used, community and business oriented events were not as frequently recalled among participants and may not have been as effective in terms of driving participation.

- While the Energy Action message was promoted at numerous community events (such as Power to Save Night, an Energy Breakfast, or farmer's market), few program participants recalled or attended events.
- However, these events may still have had an indirect influence on participation, by raising general awareness of energy efficiency in the community through marketing activities used to promote events – i.e., newspaper ads or press releases.
- Similarly, the NEC contest was marketed through community events, PR, and partner organizations. Though over one-third (35%) of participants with Energy Action awareness had heard of the Neighborhood Energy Challenge, few participated in the contest.[26]

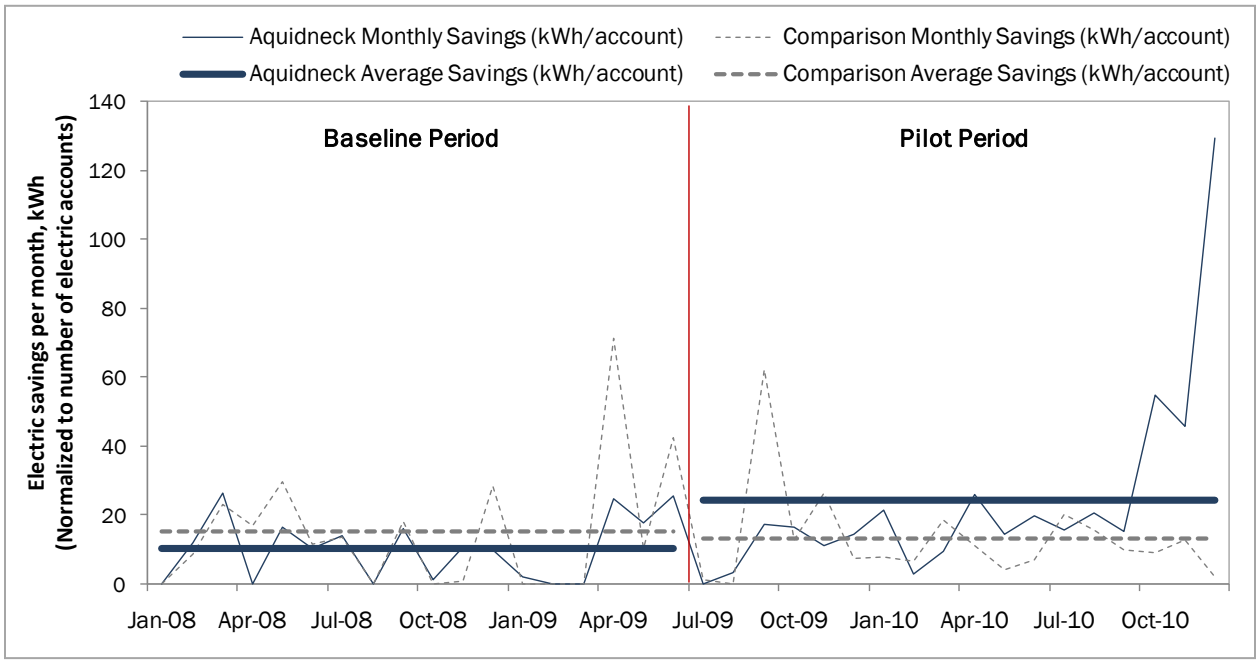
➢ The door-to-door approach seems to be effective for small business.

- Small C&I program staff conducted direct outreach early in the pilot, by phone and in person, as well as hosting business-oriented events. Program stakeholders felt that business-oriented events such as an event at the Chamber of Commerce and school events – did not generate as much interest from Small C&I customers as expected.
- Pilot stakeholders changed the strategy midway through the pilot when it appeared that C&I energy savings goals were not within reach. Eventually, program staff launched a "Main Streets" approach to small business outreach, going door-to-door with program materials to talk to small business owners.
- Looking at electric energy savings from Small Business applications (Figure 4), we see a substantial increase in Small C&I electric program activity toward the end of the pilot period, suggesting that pilot efforts were effective in driving participation

[26] Over the course of the pilot, the Neighborhood Energy Challenge enrolled fewer customers in the contest than expected – about 125 – despite significant grassroots marketing and PR.

in Small C&I electric programs overall, and that the change in strategies to a door-to-door approach was likely effective.

Figure 4. Small Business Electric Savings Trend, Aquidneck and Comparison Regions



3.2.3 Implications for Replicability

The Aquidneck pilot demonstrated that the community-based program strategy is worth replicating (due to its cost-effectiveness) and replicable (as a process), though the specific tactics may be difficult to replicate per se. Here we summarize our findings on the two dimensions of replicability outlined in the Evaluation Objectives:

- **Replicability as an energy efficiency strategy:** The Aquidneck pilot demonstrated that the pilot strategy – of investing in community-based partnerships, incremental marketing, and staff time – could deliver cost-effective incremental energy savings.
- **Replicability of pilot implementation tactics:** The Aquidneck pilot demonstrated that it takes time and commitment to work with stakeholders from the outset to develop a community-based outreach approach that fits the strengths and needs of a particular region, and build support for the approach. Many successful marketing tactics were the result of stakeholder collaboration, and may have been difficult to plan at the outset of the program. Specific tactics used in the Aquidneck pilot would likely need to be tailored for different communities.

The following discussion describes a few considerations for PAs planning to replicate the process of Aquidneck pilot as a geographically focused energy efficiency program strategy for increasing participation.

Building community partnerships and facilitating outreach through community organizations requires staff resources as well as monetary investment. To optimize the use of PA resources for community-based efforts, PA staff should define the type of relationship they

wish to have with community partners, and refine community partner selection and partnership agreements accordingly.

Based on this pilot, multiple types of community-based organizations could be considered as partners for future programs. However, program designers should realize that community-based partners may not have the internal capacity to meet all the needs of the program, and either the PA or the partner organization may require additional staff resources, during both program planning and implementation. To minimize implementation challenges, partnership arrangements should consider the unique motivations and capacities of potential partners, and attempt to engage with partners early in the process to set expectations and responsibilities, and address unique needs.

To maximize program design effectiveness, programs should empower community partners to leverage the resources, connections, and brand reputation they have to promote National Grid energy efficiency programs. As this pilot demonstrated, community-based efforts can increase effectiveness by using multiple channels and brands – particularly among residential customers. Co-branding through multiple organizations (retaining the National Grid brand on partner materials) can also be effective.

Program administrators should continue to examine drivers and barriers of program participation among small C&I customers to confirm that door-to-door efforts are more effective in driving program participation, and more cost-effective, than alternative small C&I strategies.[27]

Program administrators should also examine how in-person community events influence program participation. For the Aquidneck pilot, it appears that marketing and promotion of activities (e.g., PR and direct mail about contests and events) may have informed more customers about National Grid programs than the events themselves. Our analysis suggests that there may be an indirect effect of events and activities on program participation, especially if events or contests are well promoted. However, it is unclear how community events influenced participation beyond the impact of incremental program marketing.

Sharing performance data like program participation – to the extent possible – can also maximize program effectiveness by enabling community partners to modify their marketing and implementation approach based on results. During the Aquidneck pilot, National Grid and community partners were able to modify tactics quickly in response to program participation feedback as well as marketing and outreach opportunities. In future community-based efforts, we recommend creating metrics to capture marketing effectiveness that can be shared with stakeholders and implementers, and developing processes to share these metrics in real time with partners and implementers.

[27] In some cases (according to the PA), direct outreach has the same close rate as other types of outreach, but a higher volume of initial participants. In the case of the pilot, program stakeholders felt that direct outreach was needed to increase participation. Future community-based efforts could examine cost-effectiveness in more detail.

3.3 *Energy Efficiency as T&D Deferral Strategy*

3.3.1 T&D deferral planning for the Aquidneck pilot

In initial filings, National Grid planned that the Aquidneck pilot would be a T&D deferral strategy, to address interest in avoiding construction of a substation in the Aquidneck area by implementing direct load control. However, T&D planning efforts were not fully developed in 2008 when the Aquidneck pilot was planned. The lack of planning for T&D deferral strategies at the time made it difficult to establish performance measurement and tracking to gauge the effectiveness of the Aquidneck pilot as a deferral project. Therefore, the Aquidneck pilot continued as an energy efficiency project without setting goals or tracking T&D benefits.

National Grid is now planning T&D deferral demonstration pilots similar to the Energy Action pilot to explore how to package energy efficiency and T&D alternatives under System Reliability Procurement provisions of Rhode Island law. The company is now looking at Non-Wires Alternatives (NWAs) in the T&D planning process and evaluating trade-offs; there are many challenges involved.

Additionally, according to National Grid staff, from 2009 through 2010, the regulatory framework in Rhode Island's System Reliability Planning (SRP) did not support consideration of T&D deferral strategies such as NWA projects like the Aquidneck pilot and distributed resources. At this point, National Grid is engaged with external stakeholders in evolving SRP. The company is also in the early stages of including energy efficiency programs as non-wires alternatives. The internal processes and communication are well underway. For example, Distributed Resources and Energy Efficiency staff is working with T&D planning staff to develop a screening process that will consider a suite of non-wires alternatives, including targeted energy efficiency, during the T&D process.

3.3.2 Measuring T&D Deferral Potential of Pilot

Though establishing a measurement framework to assess the pilot's effectiveness as a T&D deferral strategy was not a focus of program planning, it is still possible to look at changes in demand at a high level.[28] In this section, we discuss changes in peak demand, as well as three confounding factors that make it difficult to parse out the effect of the pilot on peak demand. These are factors that PAs and evaluators should consider when planning measurement and evaluation of future community-based programs that need to determine their cost-effectiveness as T&D deferral or substitution projects.

[28] For example, measuring changes in demand on overloaded circuits was not part of the program plan. The age of the distribution system on Aquidneck – and associated "low-tech" metering – compounds the challenge of measuring peak demand reduction on the most overloaded circuits.

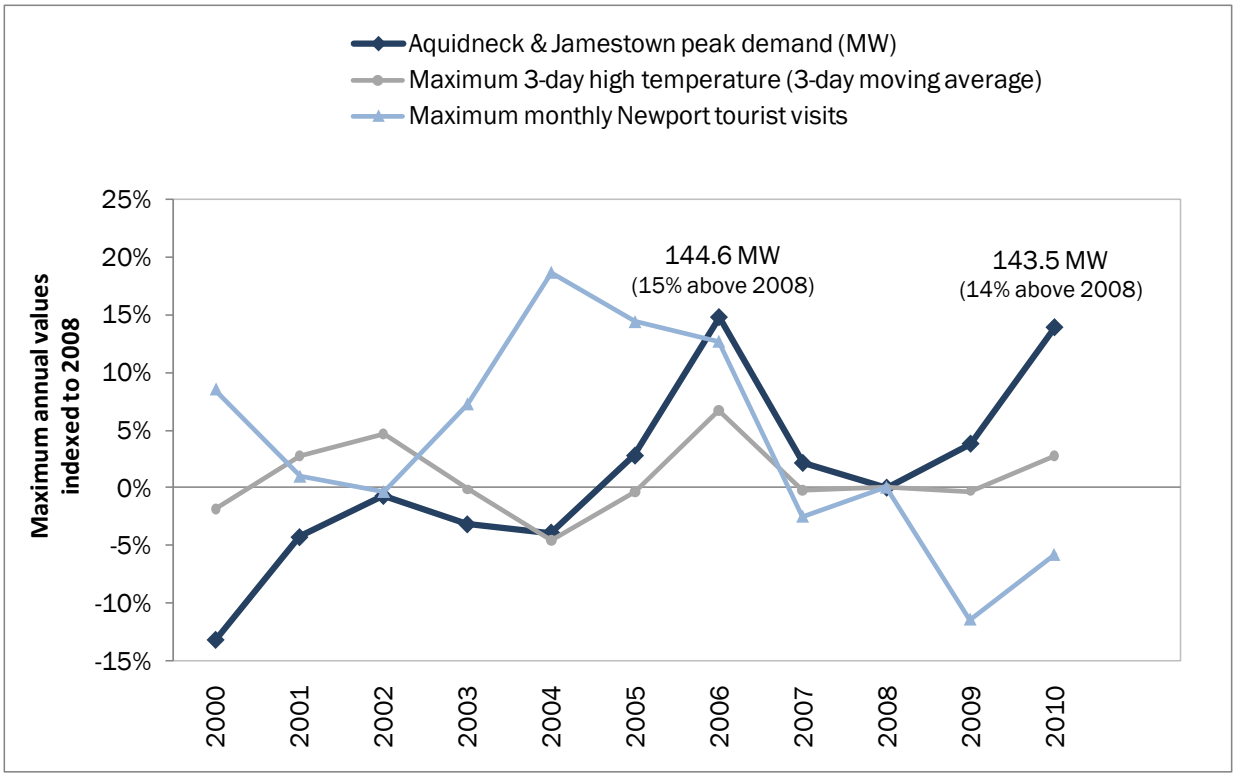
Peak Load Trends in Aquidneck

Based on transmission data from National Grid, peak demand in the pilot area increased by 6% from 2008 to 2009 and 10% from 2009 to 2010. However, demand was slightly lower than 2006 levels (Figure 5). It is difficult to determine how demand may have changed in the absence of the pilot, as numerous factors may have influenced demand in each program year as well as the baseline. Here we discuss a few confounding factors.

- Confounding Factor 1 - Transmission activity
  - **Load shifting**: It is possible that load shifts occurred during the baseline or pilot periods. It is unclear how moving customers to different lines might skew load numbers.
  - **Large customer participation in voluntary price response programs**: It is unclear whether the Navy is or was participating in this forward capacity market or a voluntary price response program.
- Confounding Factor 2 - Weather
  - **Weather patterns**: The summers of 2007-2009 did not have the heat waves of 2010 (or 2006). The duration of high-temperature, high-humidity days matters more to peak demand than the temperature itself, as there is more diversity in the load in the first few days of persistent high temperature. Humidity and wind also affect peak demand.
  - **Duration of a heat wave**: The peak often occurs when there are consecutive high-temperature days – for example, after a couple of days of persistent high temperature and high-humidity days, if air conditioners have been turned on and left on. The peak might not fall on the day of the highest temperature.
- Confounding Factor 3 - Energy use and load profiles
  - **C&I energy use profiles**: Energy use profiles of largest C&I customers, such as the Navy, could impact peak demand if the high-use period shifts from off-peak to on-peak periods. For example, aircraft carriers might come to the Navy dock and plug in, drawing about 1.5 MW at such a time. The number of employees living and working at the Naval Station may have changed in the past few years as a result of 2005 Base Realignment and Closure (BRAC) changes.
  - **Tourism**: Tourism in Newport and Aquidneck Island is heaviest on weekends in July and August. Peak demand also occurs on summer weekends, with circuits in the Aquidneck area showing the highest load on summer afternoons, likely Saturdays between 4 pm and 6 pm. This pattern coincides with tourism activity such as restaurants, hotels, and vacation homes operating air conditioners. Tourism in this area has fluctuated in recent years in concert with economic cycles. Coincidence of a heat wave with increased tourist activity could influence demand on the circuits.
  - **Aquidneck commercial development**: The real estate market on Aquidneck could also influence demand. From the perspective of one National Grid staff member, major commercial development (e.g., new big box retail) could eradicate all apparent savings from energy efficiency.

As Figure 5 shows, some of these factors have moved in parallel with peak demand in the last ten years, making it difficult to distinguish changes in demand due to energy efficiency programs from other confounding factors. Future evaluations need to be aware of, and account for, these factors while establishing measurement protocols at the outset of community-based program efforts.

Figure 5. Changes in Peak Demand, Temperature, and Tourist Visits Compared with Baseline Year (2008)



Note: 2008 serves as the baseline year, with all other data points indexed to 2008 values.
Peak demand source: National Grid transmission data
Temperature source: NOAA National Climatic Data Center, Global Summary of the Day for Newport Weather Station. Maximum 3-day moving average in July and August.
Tourist visit source: Newport & Bristol County Convention & Visitors Bureau, Newport Gateway Visitor Center counts. Maximum monthly visits per year (either July or August in each year).

3.3.3 Considerations for Future T&D Deferral or Substitution Evaluation

This is one of the first community-based pilots to attempt to fit into the dual modes of energy efficiency and T&D deferral. Assessment of this and future pilots (or programs) will help to build a set of values that can be used for forecasting and in benefit-cost analyses that may encompass several wires and non-wires alternatives. National Grid is developing a model that may be able to incorporate T&D deferral or substitution impacts of energy efficiency programs in non-wires alternatives planning. Based on our interviews, the model may need more performance data from targeted, community-based energy efficiency initiatives – both within and outside of National Grid's territory. Here, we provide process recommendations to

help collect this performance data from future community-based programs. Our general process recommendations to help assure appropriate evaluation include:

- Engagement of the National Grid community-based PA at all stages of the non-wires alternative assessment for the target area– including goal setting.
- Collaboration between PAs of community-based programs and National Grid staff with intimate knowledge of the circuits in the area targeted by a program (e.g., how the electricity on those circuits is managed).
- Incorporation of market knowledge of economic factors such as tourism and large business changes in the targeted area into the evaluation plan – e.g., to ensure that the baseline reflects true counterfactual conditions, and that measurement approach can "parse out" effects of targeted energy efficiency with expected fluctuations due to other factors.
- Continuation of work with T&D planners to understand the screening process, including what information and metrics might be needed for energy efficiency projects to be considered during the process, and under what conditions (e.g., geographic constraint) energy efficiency programs might be considered.
- Building measurement and evaluation procedures into each community-based pilot to deliver the data required to meet capital planning screening criteria, and build a knowledge database around T&D impacts of energy efficiency programs in general.

Next are a few measurement approaches that could help the Energy Products group evaluate the impact of an energy efficiency program on demand.

- Market Characterization Assessment. This type of evaluation could build on information from the supply side planners to more fully understand whether energy efficiency programs could potentially be an effective alternative to a wires option. For example, this type of assessment could trace historical trends and patterns in the customer base that feeds a particular constrained circuit to provide insight into how users are changing (e.g., what types of businesses or residential shifts are driving changes – more small businesses, or large commercial users). Such analysis could help identify characteristics that determine whether an area is a good candidate for targeted energy efficiency efforts (i.e., if demand increases are driven by customers who could decrease demand by taking program-based energy efficiency actions). This type of research could help inform decision making when considering NWAs.
- Demand Impact Assessment. Determine demand (kW) reduction associated with targeted energy efficiency program investments and installations. This is already done across several programs and includes:
    - Approaches such as engineering estimates of installations, verification and metering, or a more rigorous evaluation approach (such as the level of evaluation required to bid capacity into the forward market), but still assessing from the customer side of the meter.
    - Moving to a comparison approach from the supply side through monitoring of utility-level data at different areas along the distribution system.

- **Knowledge Base and Benchmarks.** Create benchmarks to forecast energy efficiency effectiveness. Multiple studies that quantify reduction in peak demand attributable to energy efficiency initiatives are needed to facilitate consideration of energy efficiency programs in non-wires alternatives. Specifically, knowledge is required of the cost-effectiveness of energy efficiency initiatives in delivering a quantifiable reduction in peak load for a given investment in community-based energy efficiency. Levelized costs – calculated as dollars of energy efficiency program costs per kW reduction – are one way to look at the cost-benefit relationship of energy efficiency investment and demand reduction. There are data already available on the levelized cost of energy efficiency programs generating demand reduction – e.g., the levelized cost of energy efficiency investment per kW. This is not specific to what could be obtained from this type of pilot program, but is available to give an idea of the range of costs required to obtain capacity reductions.

4. SUPPLEMENTAL FINDINGS

4.1 Cost-Effectiveness Analysis Results

4.1.1 Energy Savings Trends

The figures below show monthly trends in energy savings (normalized to the number of electric or gas customer accounts) in Aquidneck and the comparison towns, for the baseline and pilot periods. Each chart shows monthly savings from energy efficiency programs in Aquidneck and the comparison towns – the thin lines – as well as average savings per account in each period – the thick lines. In each chart, Aquidneck savings are designated with solid lines while comparison group savings are designated with dotted lines.

For all customer sectors, Figure 6 shows that electric savings (from participation in electric energy efficiency programs) in Aquidneck and the comparison towns were trending in a similar direction in the baseline period. However, in the pilot period, Aquidneck savings increased toward the end of the pilot period, while savings in the comparison communities remained steady. Overall, average savings per account increased more in Aquidneck than the comparison group, resulting in positive incremental savings.

Figure 6. Electric Savings Trend, Aquidneck and Comparison Regions

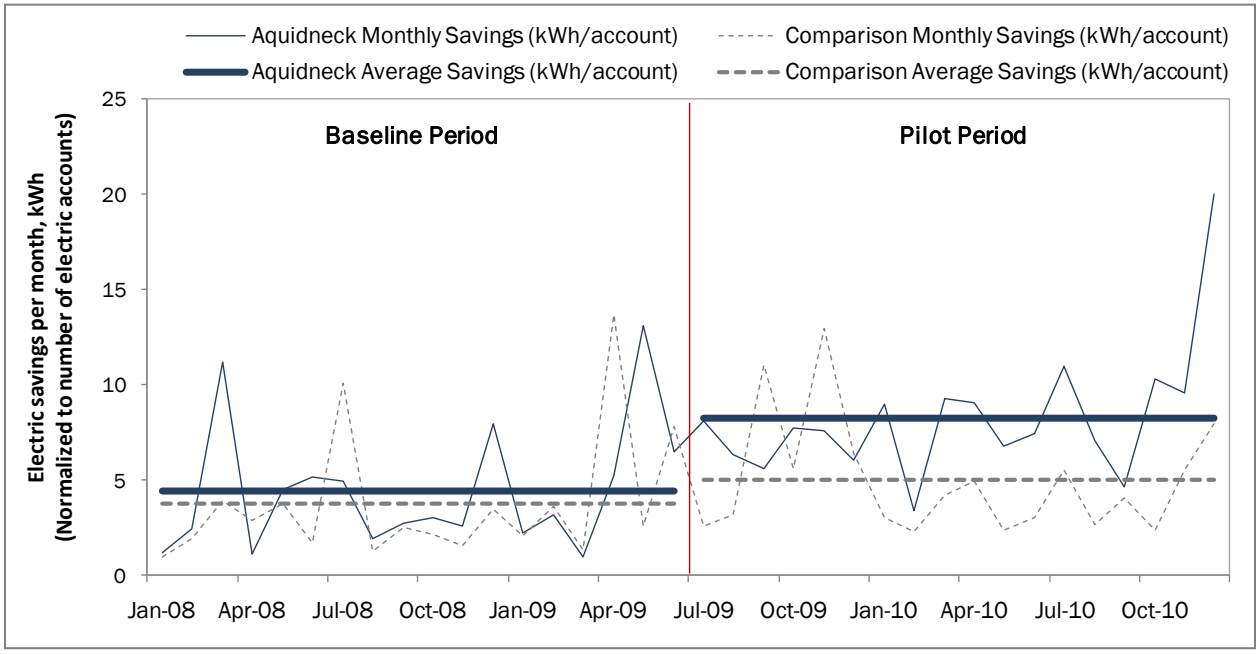
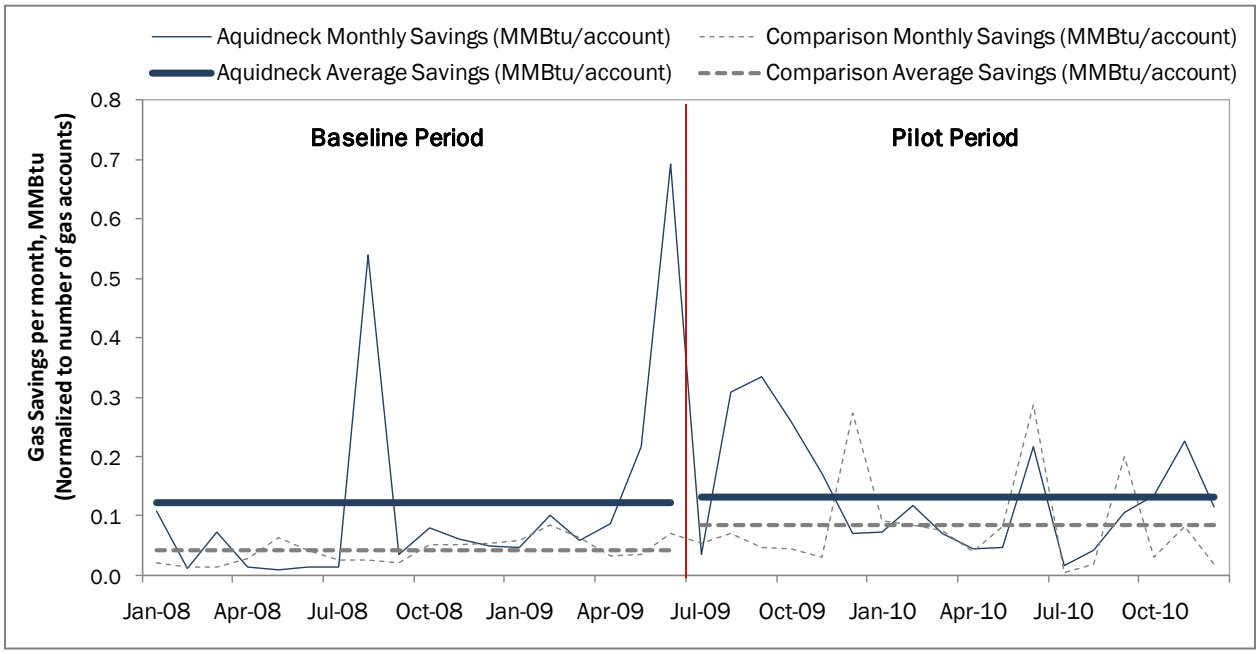


Figure 7 shows gas savings for all customer sectors (from participation in electric energy efficiency programs) in Aquidneck and the comparison towns. Average gas savings per account increased by a wider margin in the comparison group than in the Aquidneck area between the baseline and pilot periods. There were a few upticks in gas program activity in Aquidneck before the pilot started, particularly in the summers of 2008 and 2009. According to the PA, some of the larger gas C&I accounts were targeted in the baseline

period, which brought up the baseline average. Overall, Aquidneck gas savings increased from 2.29 MMBtu per gas customer during the baseline period to 2.34 MMBtu per gas customer during the pilot period, while gas savings in the comparison communities increased from 0.77 MMBtu per gas customer during the baseline period to 1.54 MMBtu per gas customer during the pilot period.

Figure 7. Gas Savings Trend, Aquidneck and Comparison Regions



4.2 Incremental Savings by Sector

While it is not possible to estimate cost-effectiveness analysis by sector (residential and C&I), incremental savings analysis by sector provides additional insight into program performance during the pilot. Residential electric and gas efforts and C&I electric efforts generated incremental savings in Aquidneck during the pilot (Table 7). Gas C&I efforts in Aquidneck did not generate incremental gas savings, though there was still an increase in C&I gas savings relative to the baseline period.

Table 7. Aquidneck Pilot Savings by Sector

Total Electric Savings (MWh)		Total Gas Savings (MMBtu)	
Residential		Residential	
Baseline Period Savings	909	Baseline Period Savings	10,017
Pilot Period Savings	2,288	Pilot Period Savings	13,354
Change in Savings	1,379	Change in Savings	3,338
Expected Change in Savings	1,085	Expected Change in Savings	1,304
Incremental Savings [29]	**294**	**Incremental Savings**	**2,034**
Incremental Savings Percent [30]	**12.8%**	**Incremental Savings Percent**	**15.2%**
Commercial		Commercial	
Baseline Savings	1,906	Baseline Savings	10,689
Pilot Savings	2,965	Pilot Savings	12,253
Change in Savings	1,059	Change in Savings	1,564
Expected Change in Savings	(512)	Expected Change in Savings	10,797
Incremental Savings	**1,571**	**Incremental Savings**	**0**
Incremental Savings Percent	**53.0%**	**Incremental Savings Percent**	**N/A**
Overall		Overall	
Baseline Savings	2,815	Baseline Savings	20,705
Pilot Savings	5,253	Pilot Savings	25,607
Change in Savings	2,439	Change in Savings	4,902
Expected Change in Savings	792	Expected Change in Savings	8,425
Incremental Savings	**1,647**	**Incremental Savings**	**0**
Incremental Savings Percent	**31.4%**	**Incremental Savings Percent**	**N/A**

The charts below show savings trends by sector. Electric savings from residential programs increased substantially in both the Aquidneck region and the comparison region between periods, though savings in Aquidneck increased by a larger margin (Figure 8). Electric savings from C&I programs increased in Aquidneck between periods, particularly toward the end of the pilot period, while savings decreased in the comparison region between the baseline and pilot periods (Figure 9).

[29] Incremental savings are the difference between the actual change in energy savings in Aquidneck (between the pilot and baseline periods) and the expected change in savings (calculated as the actual change in energy savings per account in the comparison group, multiplied by the number of Aquidneck accounts).

[30] The incremental savings percent represents the proportion of Aquidneck pilot savings that were incremental.

Figure 8. Residential Electric Savings Trend, Aquidneck and Comparison Regions

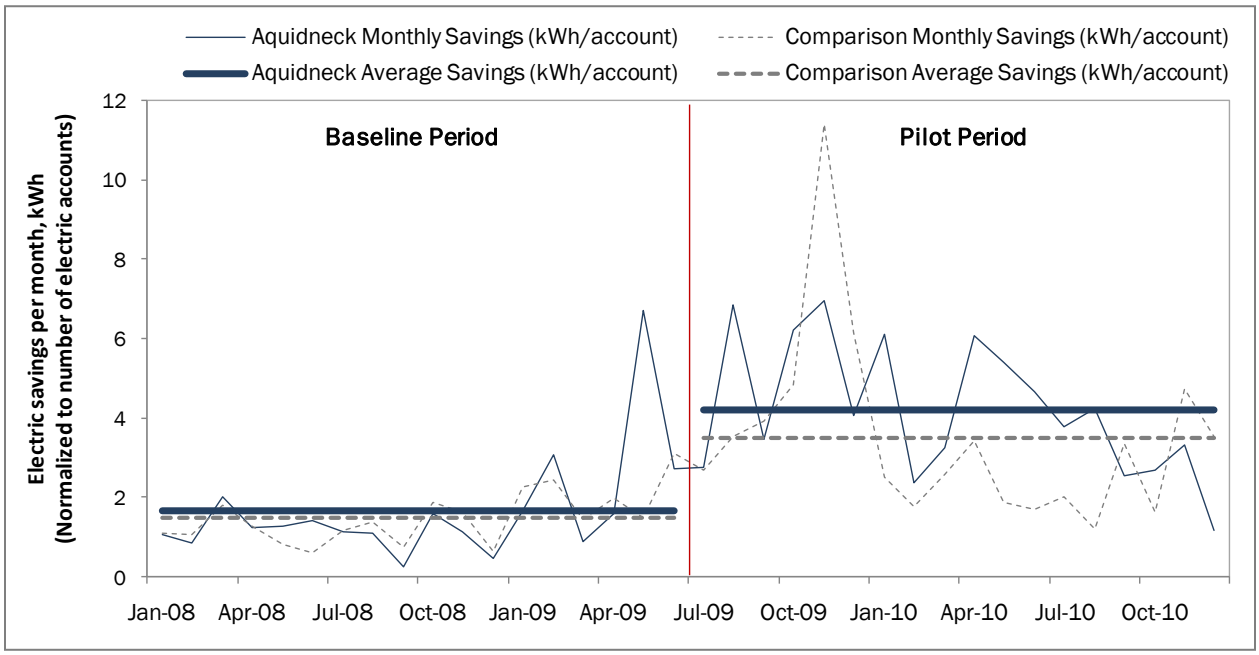
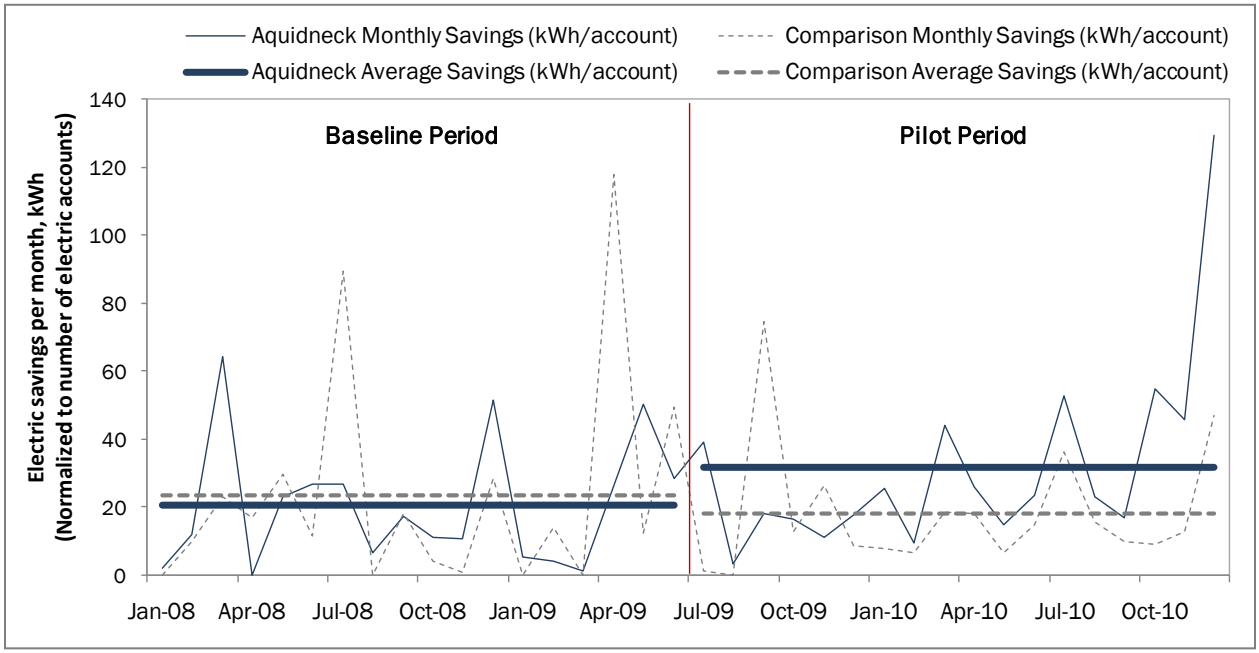
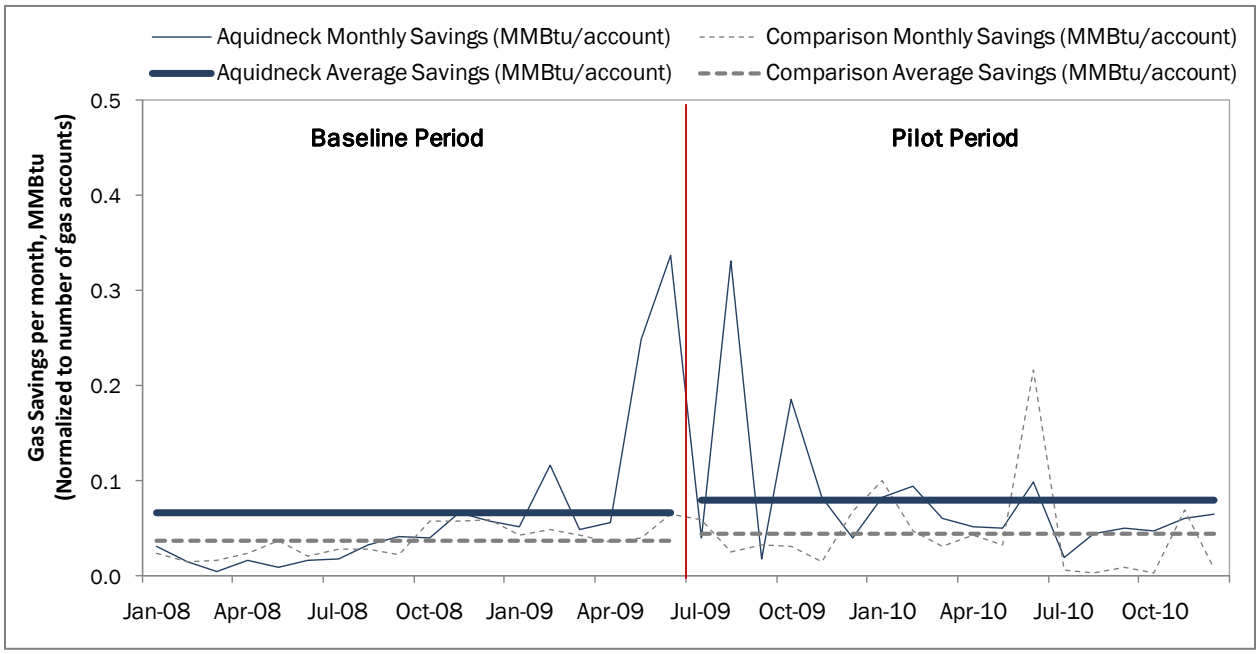


Figure 9. Commercial & Industrial Electric Savings Trend, Aquidneck and Comparison Regions



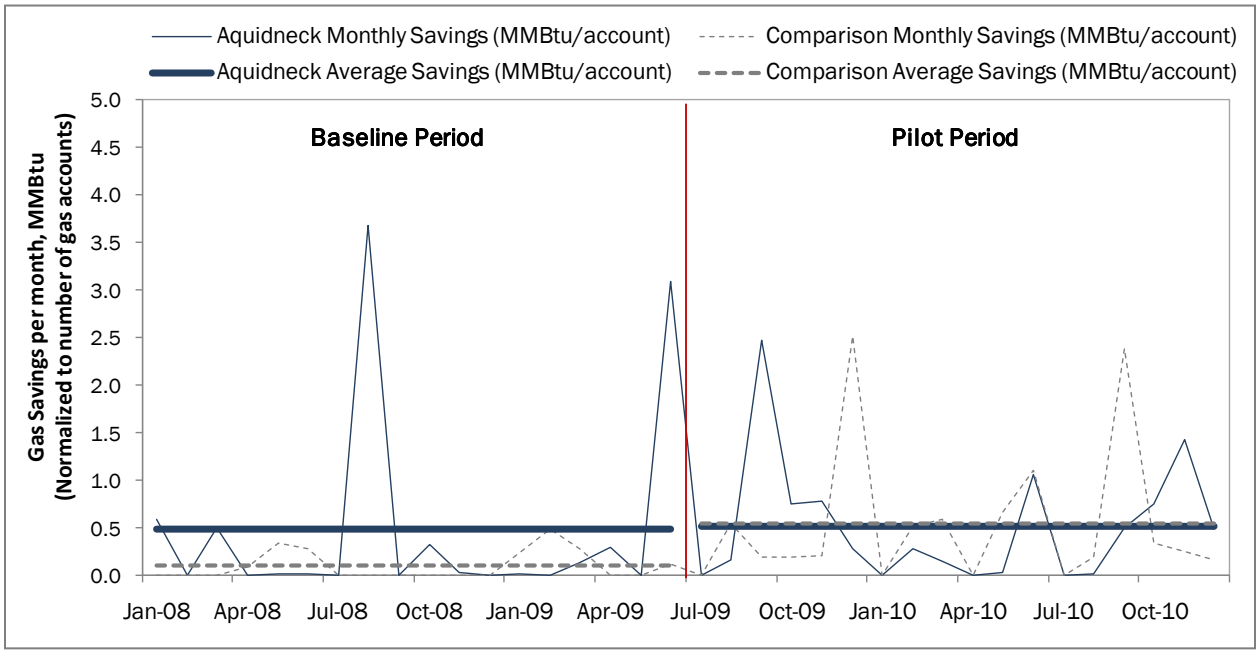
For residential gas programs, both the Aquidneck and the comparison communities increased between periods. In Aquidneck, the greatest savings occurred right after the launch of the pilot, following a period of high activity in May and June before the pilot launched (Figure 10).

Figure 10. Residential Gas Savings Trend, Aquidneck and Comparison Regions



Savings from C&I gas programs in Aquidneck were relatively constant between periods (on average), while C&I gas savings increased substantially in the comparison communities during the pilot period (Figure 11). A couple of relatively high-activity periods occurred for C&I gas programs before the pilot launched, effectively creating a higher baseline for Aquidneck than comparison communities. While commercial gas programs did not reach the incremental increase expected based on the comparison group, commercial gas savings still achieved program goals (see Table 1.).

Figure 11. Commercial Gas Savings Trend, Aquidneck and Comparison Regions



4.3 Participant Survey Findings

This section describes results of a telephone survey of residential National Grid energy efficiency program participants who live in the pilot towns. We conducted the survey after the pilot ended, in January 2011. These residential customers participated in National Grid energy efficiency programs during the pilot period.

4.3.1 Demographic and Housing Characteristics

The majority of survey respondents were homeowners living in single-family homes (83%). Only 20% of participants' homes have central air conditioning. Nearly all (96%) participants live in their homes year-round. The educational level of participants is higher than average within the pilot towns – 77% have at least a bachelor's degree, and 42% a graduate or professional degree.

4.3.2 Energy Action Awareness

Over one-third (37%) of participants were aware of the Energy Action initiative. Eighteen percent of the sample recalled Energy Action on an unaided basis (by name), and 18% on an aided basis (after hearing a description of the pilot).

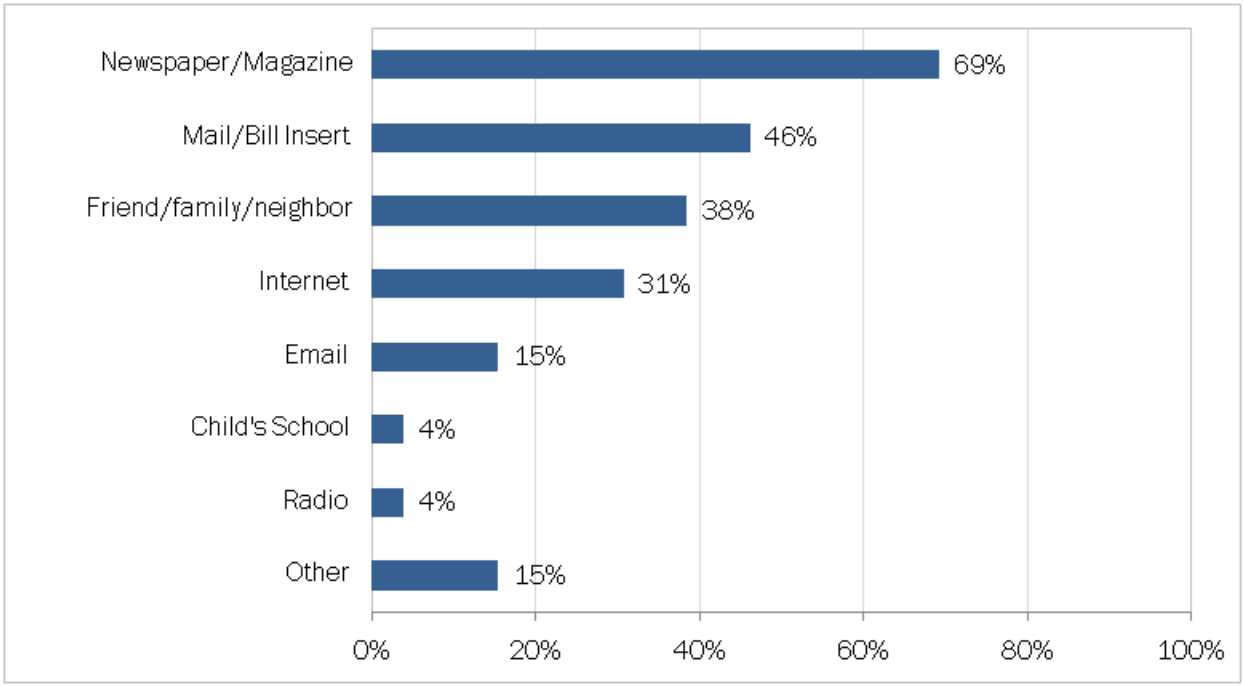
4.3.3 Referral to National Grid Energy Efficiency Program

Participants were more likely to have heard about National Grid energy efficiency programs through standard program outreach approaches – such as bill inserts or at the point of purchase or installation – than through pilot-specific approaches. Nearly one-quarter of participants (24%) learned about National Grid energy efficiency programs through a National Grid bill insert, though no participants mentioned Energy Action in association with this bill insert. Newspaper articles – exclusive to pilot efforts – were the fourth-most-common source of information about energy efficiency programs, mentioned by 14% of participants as the way they learned about their energy efficiency program. In total, about 20% of participants recalled hearing about their program through a marketing channel specific to Energy Action, such as a newspaper article, community event, or TV/radio advertising.

4.3.4 Recall of Energy Action Messages

The majority of participants with Energy Action awareness recalled hearing Energy Action messages through a newspaper or magazine (69%). The majority of newspaper/magazine messages came from news stories or articles, rather than advertising. The second-most-recalled source of Energy Action messages was the mail (46%). Participants' relatively high recall of Energy Action newspaper articles and the proportion of participants that learned of their energy efficiency program through the newspaper (14%) suggests that local newspaper and PR efforts may have had a greater influence on program awareness and participation than other messaging tactics (at least among residential customers).

Figure 12. Recall of Energy Action Messages
Among People Who Have Seen or Heard about Energy Action (n=26)



Percentages total more than 100% because respondents could select multiple responses.

Participants who received Energy Action information through the mail attributed this information to National Grid, Rise Engineering, the Newport Chamber of Commerce, the Neighborhood Energy Challenge, and AIPC (listed in order of recall frequency). Among participants who recalled Energy Action messages online, participants were more likely to recall information from nationalgrid.com rather than powerofaction.com or the NEC website.

About one-third (35%) of participants with Energy Action awareness had heard of the Neighborhood Energy Challenge, a community contest to save energy. This puts the NEC on par with friends/family and the Internet as channels through which people may have heard of Energy Action. Three respondents participated in the Neighborhood Energy Challenge. Two of these respondents participated in their energy efficiency program after signing up for the Neighborhood Energy Challenge.

Only three participants recalled attending an Energy Action event. Events mentioned include Earth Day, Energy Independence Day, the Energy Breakfast, Farmer's Market, and the Rotary Club. No one recalled a Go Green Night or Power to Save night. Only one of the participants we spoke with had entered the Newport Gulls contest.

4.3.5 Influence of Energy Action

Nearly two-thirds (62%) of people with Energy Action awareness said that information about Energy Action influenced their decision to participate in an energy efficiency program. This means that Energy Action information influenced the participation decision of nearly one-quarter (23%) of the sample (considering people with and without awareness of Energy Action).

Over half (57%) of people with Energy Action awareness said that Energy Action messages provided them with new information on saving energy in their homes. The marketing messages alone increased the motivation of 43% of people with Energy Action awareness to make their homes more energy efficient.

Participants who learned new information from Energy Action messages frequently mentioned specific products they should use, such as lighting / light bulbs, appliances and insulation. Only two participants interpreted the messages in a broader sense – for example, that National Grid is offering programs to help save energy. Two participants may have misattributed Energy Action messages – one associated Energy Action with the EnergyWise audit, and another thought Energy Action provided new information about wind energy.

4.3.6 Influence of Energy Action among EnergyWise Home Audit Participants

Encouraging residential customers to sign up for an EnergyWise home energy audit was a focus of pilot marketing and outreach. More than four in ten (43%) of EnergyWise participants who participated in EnergyWise during the pilot were aware of Energy Action messages, indicating that the pilot may have had some influence on their program participation. However, awareness of Energy Action had no influence in terms of their satisfaction with the audit, likelihood to take follow-up recommendations, and the influence of audit information on the decision to take follow-up measures.

Among EnergyWise participants who were aware of Energy Action, nearly all (92%) said they knew about National Grid energy efficiency programs prior to 2010. Conversely, about half (56%) of EnergyWise participants without Energy Action awareness knew about National Grid energy efficiency programs prior to 2010. This suggests that people who recalled Energy Action messages may have been more attuned to energy efficiency messages and opportunities prior to the pilot – in other words, messages reached people with a prior inclination to listen to energy efficiency information.

4.3.7 Program Participant Opinion of National Grid

About 73% of energy efficiency program participants (who had participated in a National Grid program during the pilot) considered themselves very or somewhat satisfied with National Grid (top two boxes of 5-point rating scale). About 29% of program participants reported that their opinion of National Grid increased as a result of installing energy efficiency program measures. There was no significant difference in satisfaction between participants with and without awareness of Energy Action (70% and 76% very or somewhat satisfied, respectively). Similarly, there was no difference in the proportion of each group whose opinion of National Grid increased as a result of participating in a National Grid energy efficiency program (23% of participants with Energy Action awareness vs. 31% without).

Most participants with Energy Action awareness said that their opinion of National Grid had not changed since learning about Energy Action (73%), while 23% reported an increase in

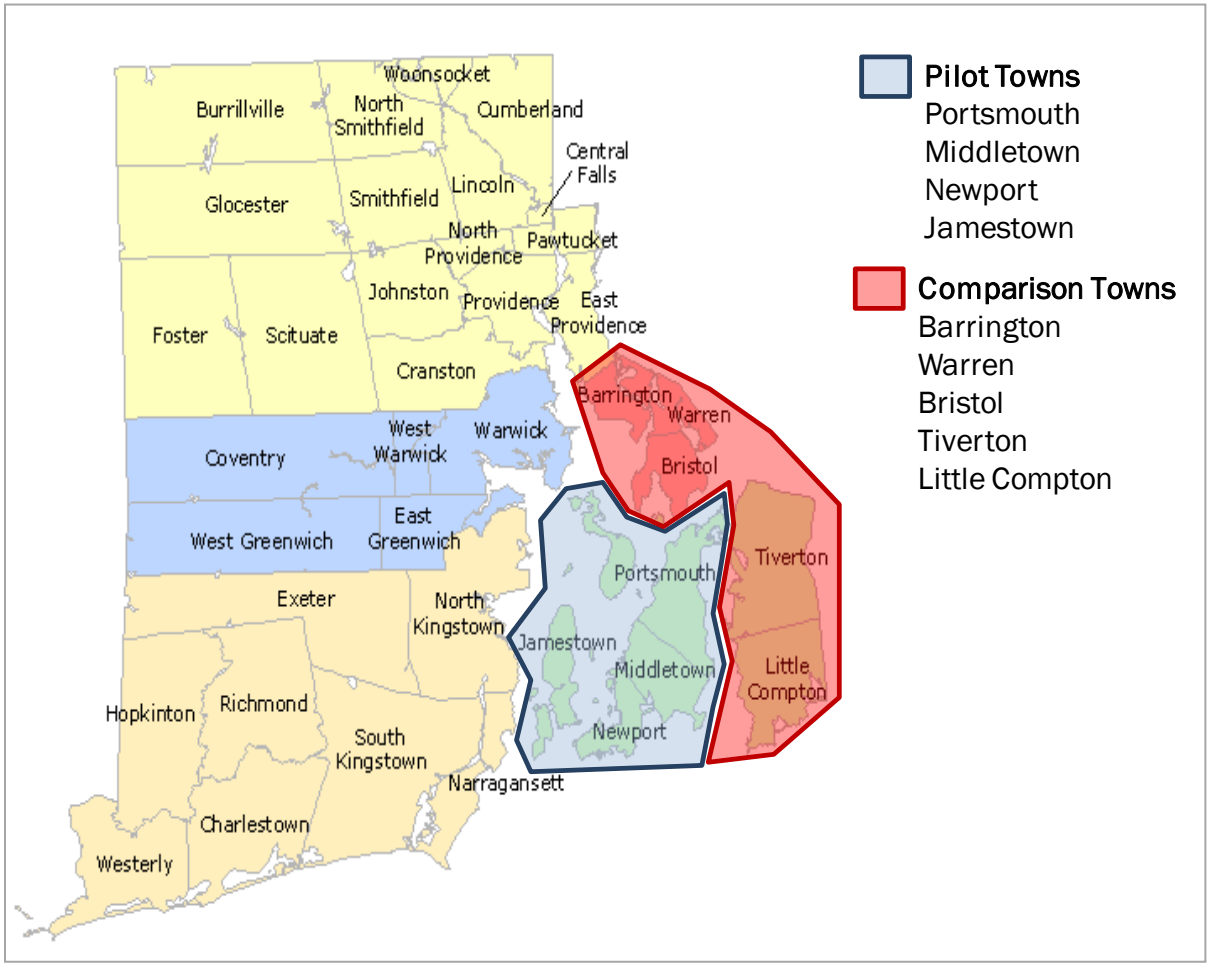
opinion since learning about Energy Action. These findings indicate that Energy Action may have increased some customers' opinion of National Grid, though the incremental effect is in line with the increase that would be expected from participating in an energy efficiency program (here, about 23%).

APPENDIX A. DETAILED METHODS

Community Selection

We based the selection of matched community characteristics on geographic, demographic, housing, and customer similarities. Figure 13 shows the geographic location of the pilot and comparison towns. We used data at a town level from the 2000 US Decennial Census to evaluate demographic and housing comparability, shown in Table 2.

Figure 13. Location of Pilot and Comparison Towns



Source: Rhode Island Department of Labor and Training

Cost-Effectiveness Analysis Approach

We calculate total benefits from incremental savings by using the 2010 Rhode Island Electric Screening Model and 2010 Rhode Island Gas Screening Model, and entering measure- or program-level incremental kWh and therms (as appropriate). Capacity assumptions (kW) are then based on the measure- or program-level ratio of kWh to kWh used in the standard screening model.

We calculate incremental program costs as the cost of saving each incremental kWh or therm that the program achieved. We assume that the cost of incremental savings is equal to the standard cost of those savings (what it would cost in the absence of the pilot, equal to average costs elsewhere in Rhode Island), plus the cost of generating those savings in Aquidneck during the pilot (since these savings are above and beyond standard program efforts). For example, for electric energy efficiency programs in 2010, we add average costs per kWh for all programs in Rhode Island in 2010 (from the Rhode Island (RI) Year End Cost Summary) to cost per incremental kWh for implementing the pilot program in Aquidneck.

The cost estimate also accounts for different average costs for each National Grid program in Rhode Island by weighting average program cost estimates by the proportion of gross deemed savings from each program during each year of the Aquidneck pilot. To estimate a weighted average cost per kWh, we first calculate the standard program cost per kWh as RI standard cost per annual kWh (based on National Grid 2009 and 2010 year-end estimates), then weight these average costs by proportion of the deemed savings for each program during the respective years of the pilot. We then multiply this weighted average cost per kWh by incremental kWh savings attributable to the pilot during each year (based on the proportion of gross energy savings occurring in each year of the pilot, and the overall incremental savings percent – here, 31.4%). We add this estimate of what incremental costs would be in the absence of the program to pilot implementation costs.

APPENDIX B. RESIDENTIAL PARTICIPANT SURVEY

PROGRAM PARTICIPATION AND READ-INS
[IF PROGRAM PARTICIPANT, flag=1]

EW. Energy Wise Home Energy Audit
S1 READ-IN: Your household received an Energy Wise home energy audit
PROGRAM READ-IN: Receive an Energy Wise Home Energy Audit

LR. Energy Star Retail Lighting
S1 READ-IN: Someone in your household purchased energy efficient lighting using an in-store coupon
PROGRAM READ-IN: Purchase energy efficient lighting using an in-store rebate or coupon

LO. Energy Star Lighting Order
S1 READ-IN: Someone in your household ordered energy efficient lighting from National Grid
PROGRAM READ-IN: Order energy efficient lighting from National Grid

ESP. Energy Star Products / Appliances
S1 READ-IN: Your household received a rebate for purchasing Energy Star Products
PROGRAM READ-IN: Purchase an Energy Star product using a rebate from National Grid

CS. Cool Smart
S1 READ-IN: Your household received a rebate for purchasing a high-efficiency central air conditioning system
PROGRAM READ-IN: Purchase a high-efficiency central air conditioning system using a rebate from National Grid

HEHW. High-Efficiency Heating & Hot Water Heating
S1 READ-IN: Your household received a rebate for a new heating system, water heater or thermostat.
PROGRAM READ-IN: Receive a rebate for a new heating system, water heater or thermostat

RB. Refrigerator Bounty / Recycling
S1 READ-IN: Your household had a refrigerator or freezer recycled by National Grid
PROGRAM READ-IN: Recycle a refrigerator or freezer

INTRO. Hello may I please speak to [NAME]? My name is _____ and I'm with Opinion Dynamics, a research firm hired by National Grid to conduct a brief survey about residential energy efficiency programs in Rhode Island. Your responses will help National Grid improve its programs and will be kept confidential.

S1. According to our records [READ IN LIST] in the past year.
a. [READ IF EW=1] Your household received an Energy Wise home energy audit

b. [READ IF LR=1] Someone in your household purchased energy efficient lighting using an in-store coupon
c. [READ IF LO=1] Someone in your household ordered energy efficient lighting from National Grid
d. [READ IF ESP=1] Your household received a rebate for purchasing Energy Star Products (You may have received a rebate for an Energy Star certified appliance)
e. [READ IF CS=1] Your household received a rebate for purchasing a high-efficiency central air conditioning unit
f. [READ IF HEHW=1] Your household received a rebate for a new heating system, water heater or thermostat.
g. [READ IF RB=1] Your household had a refrigerator or freezer removed by National Grid

S2. Are you the person in your household who is most familiar with [READ IN LIST]? [1=Yes, 2=No, 98=Don't Know, 99=Refused]

[READ IF EW=1] The energy audit
[READ IF LR=1] or [READ IF LO=1] or [READ IF ESP=1] or [READ IF HEHW=1] This purchase
[READ IF CS=1] The installation of this cooling system
[READ IF RB=1] The refrigerator or freezer you recycled
[IF RB & ESP] the appliances you purchased and refrigerator or freezer you recycled
[IF EW & ESP] the energy audit and rebate you received
[IF EW & LR] the energy audit and rebate you received
[IF RB & LR] the refrigerator or freezer you recycled and lighting rebate
[IF EW & RB] the energy audit and refrigerator or freezer you recycled
[IF LR & ESP] the appliance and lighting rebates you received
[IF RB & LR & ESP] the appliance you recycled and rebates you received
[IF EW & HEHW] the energy audit and rebate you received
[IF HEHW & ESP] these rebates and purchases
[IF LO & ESP] the appliance or lighting you received a rebate for
[IF EW & LO] the energy audit and lighting you ordered
[IF RB & CS] the installation of this cooling system and appliance you recycled
[IF RB & HEHW & ESP] the rebates you received and refrigerator or freezer you recycled
[IF EW & LR & ESP] the energy audit, and lighting or appliances you received rebates for

1. (Yes) [Continue with the person in the household who is most familiar]
2. (No) [Ask to speak with the person in the household who is most familiar]
98. (Nobody in household recalls participation) [Thank and Terminate]

S4. Can you confirm that [READ IN S1 LIST] in the past year? [1=Yes, 2=No, 98=Don't Know, 99=Refused]

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

S3. Please confirm that <street_addr> in <city> is your primary residence.
1. (Yes)
2. (No) (Specify what address this represents)
99. Refuse

Awareness of Energy Action

EA1. Have you heard of the Aquidneck and Jamestown Energy Action initiative?
1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF EA1=1]
EA2. Before this call, did you know that National Grid sponsored the Aquidneck and Jamestown Energy Action initiative?
1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF EA1=2,98]
EA3. Energy Action is the name of an energy efficiency initiative sponsored by National Grid and other organizations on Aquidneck Island and in Jamestown. The Energy Action initiative distributed information on ways to save energy in your home or business. There were also events in your area about energy efficiency and ways to save energy in your home that were sponsored by National Grid, the Aquidneck Island Planning Commission and the Neighborhood Energy Challenge. After hearing this description, do you recall hearing about the Aquidneck and Jamestown Energy Action initiative?
1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

Participation questions

P1. In addition to receiving a [READ IN LIST], did your household participate in any other energy efficiency programs or receive rebates through National Grid in 2010?
[IF S1A=1, EW S1 READ-IN]
[IF S1B=1, LR S1 READ-IN]
[IF S1C=1, LO S1 READ-IN]
[IF S1D=1, ESP S1 READ-IN]
[IF S1E=1, CS S1 READ-IN]
[IF S1F=1, HEHW S1 READ-IN]
[IF S1G=1, RB S1 READ-IN]
1. (Yes)
2. (No)
98. (Don't Know)

99. (Refused)

[ASK IF P1=1]
P2. Please tell me what other National Grid energy efficiency programs your household participated in, or energy efficiency rebates you received, in 2010. [OPEN RESPONSE with some programs pre-coded]

1. (Home energy audit / Energy Wise) [EW]
2. (Rebate / coupon for light bulb o light fixture purchased in a store) [LR]
3. (Ordered energy efficient lighting through a catalog or internet) [LO]
4. (Rebate for Energy Star refrigerator, freezer, TV or computer monitor) [ESP]
5. (Rebate for Central Air conditioning / HVAC) [CS]
6. (Rebate for Thermostat, hot water heater, heating system) [HEHW]
7. (Had old refrigerator or freezer removed by National Grid) [RB]
00. Other (specify)
98. (Don't Know)
99. (Refused)

P4. How did you learn about National Grid's energy efficiency programs? [OPEN RESPONSE]

P5. Prior to [PROGRAM READ-IN, adding –ing to verb], did you have a positive, negative or neutral opinion of National Grid?

1. Positive opinion
2. Negative opinion
3. Neutral or no opinion
98. (Don't know)
99. (Refused)

Marketing and Outreach Exposure

[ASK SECTION IF EA1=1 OR EA3=1]

M1. You mentioned that you've heard of the Aquidneck and Jamestown Energy Action initiative. I'm interested in the ways you may have received information about the Energy Action initiative.
Do you recall… [ROTATE; 1=YES, 2=NO, 98=Don't Know, 99=Refused]

a. Receiving information about Energy Action in the mail
b. Receiving information about Energy Action in an email
c. Reading about Energy Action in a newspaper or magazine
d. Seeing Energy Action on the internet
e. Hearing about Energy Action on the radio
f. Receiving information about Energy Action from your child's school
g. Hearing about Energy Action from a friend, neighbor or family member?
h. Having information about Energy Action left on your door?

[ASK IF M1A=1]
M2. You mentioned that you received information about Energy Action through the mail. Which of the following organizations sent you information about Energy Action through the mail? [ROTATE] [multiple response; check all that apply]

1. National Grid
2. Aquidneck Island Planning Commission [Note to interviewer: also called Aquidneck Island Energy Alliance]
3. Neighborhood Energy Challenge
4. The City of Newport [Note to interviewer: also includes Newport Energy & Environment Commission]
5. Greater Newport Chamber of Commerce
6. RISE Engineering
00. (Other, Specify)
98. (Don't Remember)
99. (Refused)

[ASK IF M1B=1]
M3. You mentioned that you received information about Energy Action through email. Which of the following organizations sent you information about Energy Action through email? [multiple response; rotate; check all that apply]

1. National Grid
2. Aquidneck Island Planning Commission [Note to interviewer: also called Aquidneck Island Energy Alliance)]
3. Neighborhood Energy Challenge
4. The City of Newport [Note to interviewer: also includes Newport Energy & Environment Commission]
5. Greater Newport Chamber of Commerce
6. RISE Engineering
00. (Other, Specify)
98. (Don't Remember)
99. (Refused)

[ASK IF M1C=1]
M4. You mentioned that you saw or read about Energy Action in a newspaper or magazine. Did you see Energy Action mentioned in an advertisement, or in a news story?

1. Advertisement
2. News story/article
3. (Both)
00. Other (specify)
98. Don't Know
99. Refused

[ASK IF M1D=1]
M5. You mentioned that you saw information about Energy Action on the internet. On which of these websites did you see information about Energy Action? [ROTATE; MULTIPLE RESPONSE]

1. National Grid website (nationalgrid.com)

2. Neighborhood Energy Challenge (neighborhoodenergychallenge.org)
3. Energy Action website (powerofaction.com)
00. Other (Specify)
98. Don't know
99. Refused

[ASK IF ANY M1A-H=1]
M6. Did the Energy Action messages we just discussed provide you with new information about saving energy in your home?
1. (Yes)
2. (No)
3. (Never heard of it)
98. (Don't Know)
99. (Refused)

[ASK IF M6=1]
M6A. What new information did you learn from Energy Action messages? [OPEN RESPONSE]

[ASK IF ANY M1A-H=1]
M7. As a result of the Energy Action messages we just discussed, did your motivation to make your home more energy efficient change?
1. (Yes)
2. (No)
3. (Never heard of it)
98. (Don't Know)
99. (Refused)

[ASK IF M7=1]
M8. Did your motivation to make your home more energy efficient increase substantially, increase somewhat, decrease somewhat or decrease substantially as a result of Energy Action messages?
1. Increased substantially
2. Increased somewhat
3. Decreased somewhat
4. Decreased substantially
98. (Don't know)
99. (Refused)

Energy Action Events

[ASK SECTION IF EA1=1 OR EA3=1]

EV1. The Energy Action initiative also held energy efficiency events at schools, businesses, stores or as part of community festivals. Did you attend any Energy Action events on Aquidneck Island or in Jamestown?
1. (Yes)
2. (No)
98. (Don't Know)

99. (Refused)

[ASK IF EV1=1]
EV2. Did you attend any of the following events where there was energy efficiency information? [Rotate; multiple response]
1. Go Green Night held at your local school
2. Power to Save event held at your local school
3. An Earth Day event
4. Energy Independence Day
5. Energy Breakfast hosted by the Aquidneck Island Planning Commission
6. Historic Homes workshop
7. Farmer's market
8. A hardware store event
00. [ANCHOR] (Other – specify)
98. (Don't Know)
99. (Refused)

[ASK IF EV1=1 & EV2≠00 (no other events specified)]
EV4. Do you recall attending any other Energy Action Events [OPEN END]?
00. (Yes – Specify)
2. (No)
98. (Don't Know)
99. (Refused)

EV3. Did you participate in an Energy Action contest for Newport Gulls tickets? (if needed: To win a Newport Gulls ticket, you had to sign up for a Home energy audit)
1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF EV1=1]
EV5. Did the Energy Action events you attended provide you with any new information about saving energy in your home?
1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF EV5=1]
EV5A. What new information did you learn from Energy Action events? [OPEN RESPONSE]

[ASK IF EV1=1]
EV6. As a result of attending Energy Action events, did your motivation to make your home more energy efficient change?
1. (Yes)

2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF EV6=1]
EV7. Did your motivation to make your home more energy efficient increase substantially, increase somewhat, decrease somewhat or decrease substantially as a result of attending Energy Action events?

5. Increased substantially
6. Increased somewhat
7. Decreased somewhat
8. Decreased substantially
98. (Don't know)
99. (Refused)

Neighborhood Energy Challenge

[ASK SECTION IF EA1=1 OR EA3=1]

NE1. Have you heard of the Neighborhood Energy Challenge, a contest to earn points by saving energy?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF NE1=1]
NE2. Did you participate in the Neighborhood Energy Challenge?

1. (Yes)
2. (No)
3. (Never heard of it)
98. (Don't Know)
99. (Refused)

[ASK IF NE2=1]
NE3. Did the Neighborhood Energy Challenge provide you with any new information about saving energy in your home?

1. (Yes)
2. (No)
3. (Never heard of it)
98. (Don't Know)
99. (Refused)

[ASK IF NE2=1]
NE4. As a result of your participation in the Neighborhood Energy Challenge, did your motivation to make your home more energy efficient change?

1. (Yes)
2. (No)

98. (Don't Know)
99. (Refused)

[ASK IF NE4=1]
NE5. Did your motivation to make your home more energy efficient increase substantially, increase somewhat, decrease somewhat or decrease substantially as a result of participating in the Neighborhood Energy Challenge?

1. Increased substantially
2. Increased somewhat
3. Decreased somewhat
4. Decreased substantially
98. (Don't know)
99. (Refused)

[ASK IF NE2=1]
NE6. Did you [PROGRAM READ-IN] before or after you signed up for the Neighborhood Energy Challenge?

1. (before)
2. (after)
3. (during)
98. (Don't Know)
99. (Refused)

Influence of Messaging

[ASK SECTION IF EA1=1 OR EA3=1]

IM1. Are there any other ways you saw or heard about Energy Action, besides the ways we just discussed?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF IM1=1]
IM2. How else did you see or hear about Energy Action? [OPEN RESPONSE]

IM3. Did the information that you saw or heard about Energy Action influence your decision to [PROGRAM READ-IN])?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

IM4. As a result of everything you saw or heard about Energy Action, has your knowledge of energy efficiency actions you could take in your home changed?

1. (Yes)
2. (No)

98. (Don't Know)
99. (Refused)

[ASK IF IM4=1]
IM5. Has your knowledge of energy efficiency actions you could take in your home increased substantially, increased somewhat, decreased somewhat or decreased substantially as a result of the information you saw or heard about Energy Action?

1. Increased substantially
2. Increased somewhat
3. Decreased somewhat
4. Decreased substantially
98. (Don't know)
99. (Refused)

EnergyWise Battery

[ASK SECTION IF EW=1 OR P2=1]

EW1. My next set of questions is about the home energy audit you received in the past year. Did the home energy audit provide you with any new information about saving energy in your home?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

EW2. Please rate your overall satisfaction with the home energy audit, using a scale from 1 to 5, where 1 is very dissatisfied and 5 is very satisfied. [NUMERIC OPEN END]

[ASK IF EW2<4]
EW3. Why did you rate it this way? [OPEN END]

EW4. What recommendations for saving energy did you receive from your home audit? [OPEN RESPONSE]

1. (Install compact fluorescent light bulbs)
2. (Install energy efficient light fixtures)
3. (Install programmable thermostat)
4. (Install Air sealing or weather stripping)
5. (Duct sealing)
6. (Install additional insulation)
7. (Ventilation work)
8. (Replace refrigerator)
9. (Replace water heater)
10. (Upgrade windows)
11. (Upgrade heating or air conditioning system)
12. (Install or replace home appliance)
00. (Other – specify)
98. (Don't Know)

99. (Refused)

EW5. Have you taken any of the recommended steps for saving energy since your home audit?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF EW5=1]
EW6. Using scale that ranges from 1 to 5 where 1 is no influence and 5 is a great deal of influence, how much influence did the information that you received during the audit have on your decision to take the recommended steps for saving energy in your home? [NUMERIC OPEN END]

[ASK IF EW5=1]
EW7. What other factors influenced your decision to take the recommended steps for saving energy in your home? [OPEN RESPONSE]

[ASK IF EW5=2]
EW8. Why didn't you take the recommended steps for saving energy in your home?

Customer Satisfaction

P3. Prior to 2010, did you know that National Grid offered programs that help its customers save energy?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

SAT1. Please rate your overall satisfaction with National Grid, using a scale that ranges from 1 to 5, where 1 is very dissatisfied, and 5 is very satisfied. [NUMERIC OPEN END]

[ASK IF SAT1<4]
SAT2. Why did you rate it this way? [OPEN END]

SAT3. Did your opinion of National Grid change as a result of [PROGRAM READ-IN, adding –ing to verb]?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF SAT3=1]
SAT4. Did your opinion of National Grid increase substantially, increase somewhat, decrease somewhat or decrease substantially as a result of [PROGRAM READ-IN, adding –ing to verb]?

1. Increased substantially
2. Increased somewhat
3. Decreased somewhat
4. Decreased substantially
98. (Don't know)
99. (Refused)

[ASK IF EA1=1 OR EA3=1]
SAT5. Has your opinion of National Grid changed since learning about the Energy Action initiative?

1. (Yes)
2. (No)
98. (Don't Know)
99. (Refused)

[ASK IF SAT5=1]
SAT6. Has your opinion of National Grid increased substantially, increased somewhat, decreased somewhat or decreased substantially since learning about the Energy Action initiative?

1. Increased substantially
2. Increased somewhat
3. Decreased somewhat
4. Decreased substantially
98. (Don't know)
99. (Refused)

Demographics and Housing Characteristics

We're almost done with the survey. I just have some questions about your household and home.

D1. What type of residence is your home in <CITY>? Is it a..

1. A single-family detached residence
2. A single-family attached residence (for example, a townhouse)
3. An apartment or condominium in a building with 2-4 units
4. An apartment or condominium in a building with 5 or more units, or a
6. A mobile home
7. Other [SPECIFY]
98. (Don't know)
99. (Refused)

D2. Do you own or rent this home?

1. Own

2. Rent
98. (Don't know)
99. (Refused)

D3. Does this home have Central Air Conditioning?
1. (Yes)
2. (No)
8. (Don't Know)
9. (Refused)

D4. Is this home occupied year-round?
1. (Yes)
2. (No)
8. (Don't Know)
9. (Refused)

[ASK IF D4=1]
D5. Including yourself, how many people live in your household on a full time basis?
1. [NUMERIC OPEN END]

[ASK IF D4=2]
D6. During what months is this home occupied? [MULTIPLE RESPONSE; SELECT ALL THAT APPLY][INTERVIEWER: LIVING IN HOME ONLY ON WEEKENDS COUNTS AS A MONTH. PLEASE MARK]
1. (January)
2. (February)
3. (March)
4. (April)
5. (May)
6. (June)
7. (July)
8. (August)
9. (September)
10. (October)
11. (November)
12. (December)
98. (Don't Know)
99. (Refused)

[ASK IF D4=2]
D7. Including yourself, how many people live in your household during these months?
1. [NUMERIC OPEN END]

D8. What is your age?
1. (24 yrs or younger)
2. (25 to 34 yrs)
3. (35 to 44 yrs)

4. (45 to 54 yrs)
5. (55 to 64 yrs)
6. (65 years and over)
98. (Don't Know)
99. (Refused)

D9. What is the highest level of education you have completed?
1. (Less than high school)
2. (High school graduate or equivalent)
3. (Some college, no degree)
4. (Associate's degree)
5. (Bachelor's degree)
6. (Graduate or professional degree)
98. (Don't know)
99. (Refused)

D10. Please stop me when I get to the range of your household's total annual income before taxes:
1. Less than $25,000
2. $25,000 - $34,999
3. $35,000 - $49,999
4. $50,000 - $74,999
5. $75,000 - $99,999
6. $100,000 - $149,000
7. $150,000 - $199,999
8. $200,000 or more
98. (Don't know)
99. (Refused)

D11. (OBSERVATION) Sex:
1. Female
2. Male

That completes the Energy Action survey! Thank you for your participation. National Grid greatly values your opinion. Your responses have been recorded and all of your responses will be kept confidential.