ENERGY STAR® Portfolio Manager and Utility Benchmarking Programs: Effectiveness as a Conduit to Utility Energy Efficiency Programs

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ABSTRACT

The NSTAR and National Grid benchmarking programs have been early adopters of EPA's ENERGY STAR® Portfolio Manager as a customer entry point for energy efficiency rebate programs. Both programs include a technical audit of participating commercial or municipal building that results in recommendations of low/no cost and capital improvement measures, and a description of available incentives from utility energy efficiency rebate programs. The evaluation drew upon in-depth interviews with program staff, contractors, and participants; and a survey of participants. A key focus of the evaluation was to assess the effectiveness of the programs in stimulating installation of energy efficiency measures—accomplished through a comparative analysis of recommended and installed energy conservation measures. Both programs have been similarly effective in delivering electrical energy savings. National Grid's program also has been effective in delivering natural gas savings. National Grid's program has been the more effective conduit for channeling participants to its energy efficiency rebate programs. Attendance of National Grid staff at presentations of technical audit findings appears to be a critical factor in customer hand-off to the energy efficiency rebate programs. NSTAR's program has been more effective in stimulating ongoing benchmarking of facilities by participants. This may be because National Grid program participants have not received sufficient hands-on training to run Portfolio Manager. Automated benchmarking with regular downloads of usage data to Portfolio Manager may address issues with ongoing benchmarking. Faced with increased demands for energy savings, both programs have a challenge of further growth and problems of scalability.

Introduction

Seeking an effective mechanism to attract and channel commercial and municipal customers into their energy efficiency rebate programs, some utilities are using EPA's ENERGY STAR Portfolio Manager as a customer entry point for the programs. The advantages to utilities of using the Portfolio Manager include: providing customers with a standardized, nationally relevant and comparative metric of building energy performance, taking a whole building approach to assessment of customer facilities, stimulating customer awareness of and interest in energy efficiency, and identifying energy efficiency improvement opportunities. In particular, utilities hope that the identification of energy efficiency improvement opportunities will drive customers to implement energy-saving measures through the utility rebate programs.

The NSTAR and National Grid benchmarking programs have been nationally innovative programs and early adopters of EPA's Portfolio Manager tool. Indeed, NSTAR was the first utility to offer a benchmarking program and was EPA's 2005 Partner of the Year. Both programs have a similar structure that uses Portfolio Manager to benchmark a building coupled with an energy efficiency audit of the building.

National Grid Whole Building Assessment Initiative

Launched in 2005, National Grid's Whole Building Assessment (WBA) Initiative is designed to help commercial and government customers in their service territory assess the energy performance of their entire portfolio of building(s) across fuels, to take action to make the building(s) more efficient, and to sustain that efficiency over time. Participating buildings need to have annual demands of 200 kW to 2000 kW and range in size from 30,000 to 300,000 square feet. Each customer signs a Memorandum of Understanding requiring them to provide National Grid with utility bill data for any energy not provided by National Grid, water consumption data and information on building characteristics. The program uses EPA's Portfolio Manager to calculate the participating building's ENERGY STAR Energy Performance Rating and benchmarking score to gauge how its energy performance compares with similar buildings across the country. Buildings considered to be high in energy intensity qualify to have a Technical Scoping Study conducted.

The Technical Scoping Study provides efficiency recommendations including a list of low/no cost improvement strategies (with a payback of less than one year), cost-effective capital improvement measures, and a description of potential utility incentives available through the utility's energy efficiency rebate programs. The study also includes recommendations for longer-term and more complex energy efficiency opportunities. The Technical Scoping Study is followed by an Action Plan meeting with the customer to review the study findings, relevant utility program offerings, energy goals for the building and which projects the customer will undertake. Customers are encouraged to continue to monitor their energy use, re-benchmark their buildings, assess the energy performance of other buildings they may own and establish a long-term plan for achieving their energy efficiency goals.

NSTAR ENERGY STAR Benchmarking Initiative

NSTAR's ENERGY STAR Benchmarking (ESB) Initiative helps eligible NSTAR customers use the ENERGY STAR Portfolio Manager benchmarking tool to gauge how the energy performance of their building(s) compares with similar buildings across the country. Participating buildings need to be one of the building types benchmarked by ENERGY STAR Portfolio Manager. These customers receive individual training on using Portfolio Manager and assistance in benchmarking their facilities.

Customers also receive, free of charge, technical assessments of their buildings with the findings summarized in Energy Efficiency Opportunity Assessment Reports that provide recommendations for specific energy efficiency improvements. To participate, NSTAR's customers must sign memoranda of understanding committing to continue to benchmark their facilities for a period of one year – at least quarterly and preferably monthly. In addition, they must commit to performing all identified no cost/low cost measures (i.e. projects with a payback of less than one year). Continuing support is provided to participants in identifying NSTAR energy efficiency rebate programs that provide financial incentives for the implementation of energy efficiency improvements and applying for this assistance.

Objectives of the Evaluation

The evaluation included an assessment of the net value or impact of the programs for the program years 2006 and 2007. The overall objectives of the process evaluation were to explore:

- How the ENERGY STAR benchmarking programs are received by customers and vendors
- The effectiveness of benchmarking tools in attracting customers and achieving energy savings.

A key focus of the evaluation thus was to assess the effectiveness of the programs in stimulating the installation of energy efficiency measures. The findings from this evaluation were intended to be

used to determine whether the utilities should continue the benchmarking programs, and if so, identify ways to improve the programs. The resulting recommendations took into account program changes put into place since 2007. [1]

In lieu of conducting a full impact evaluation of the direct and indirect energy efficiency improvements stimulated by the programs, this evaluation assessed program value through a comparative analysis of recommended and installed energy conservation measures. Since the benchmarking programs included scoping studies that generated estimates of annual energy savings for each recommended measure, the net value of the programs was assessed through comparisons of estimated total energy savings from implementations of the recommended measures. According to Portfolio Manager staff at the EPA and based on searches of industry databases, this may be the first evaluation to be conducted for a utility benchmarking program.[2]

Methodology

The evaluation methodology relied on in-depth interviews with various market actors and a telephone survey of program participants. In December 2008, Nexus Market Research (NMR) staff conducted twenty-six in-depth interviews with staff and contractors associated with the National Grid and NSTAR benchmarking programs. These included 11 in-depth interviews with National Grid program staff and contractors, 11 in-depth interviews with NSTAR program staff and contractors, two in-depth interviews with EPA staff for Portfolio Manager, and two in-depth interviews with Massachusetts Department of Energy Resources (DOER) program managers who run similar benchmarking programs for municipalities in the same territory. The overall goal of these interviews was to obtain an understanding of the issues surrounding the design and implementation of the ENERGY STAR benchmarking programs.

Also in December 2008, NMR conducted ten in-depth interviews with program participants: five each from National Grid and NSTAR. To the extent possible, the in-depth interview participants were chosen to represent the range of sectors from the 2006 and 2007 program years. The participant in-depth interviews informed the development of the quantitative participant telephone survey. The participant survey attempted to contact all companies or organizations that had participated in the National Grid or NSTAR programs in 2006 or 2007, including those who had completed the participant in-depth interviews. Twenty-nine participants completed the survey in February and March 2009 (Table 1). Although the samples are too small to yield statistically acceptable error margins, they accounted for nearly half the population of participants and provided a generally good representation of the population.

Table 1. Participant Survey Completions

	Audit Reports Completed in 2006 & 2007	Participants with Unique Contact Information*	Participant Surveys Completed	Percent Response
National Grid Whole Building Assessment	58	24	12	50%
NSTAR ENERGY STAR Benchmarking	44	38	17	45%
Total	99	62	29	47%

* Some customers have participated in multiple locations

[1] Note that in contrast to the evaluation focus on program effectiveness in stimulating installation of energy efficiency measures, the goals of the programs themselves were defined in terms of number of buildings benchmarked or audited.

[2] EPA staff provided two case studies that included only limited results from benchmarking programs at Pacific Gas & Electric (PG&E) and Wisconsin's Focus on Energy.

Overview of Participant Sample

According to the audit reports provided by National Grid, participants received total energy efficiency recommendations of 8,993,934 kWh and 316,532 Therms of savings. The 12 National Grid respondents represented more than one-third (37%) of the total recommended electrical savings in 2006 and 2007 and more than half (57%) of the recommended natural gas savings.

According to the audit reports provided by NSTAR, participants received total energy efficiency recommendations of 11,554,286 kWh and 2,012,523 Therms of savings. The 17 NSTAR respondents represent more than two-thirds (66%) of the total recommended electrical savings and a small fraction (3%) of the recommended natural gas savings.

Estimated Impact of the Programs

The impact estimation relied on a limited approach for determining the net value of the program by matching the measures that survey respondents reported installing to those recommended in their technical assessment studies and adjusting annual energy savings for free-ridership.

National Grid: Implementation of Recommended Measures

The measures recommended for each participant in the technical study report were listed as either low/no cost measures or measures that required a capital outlay. The 12 surveyed National Grid participants received recommendations to implement energy efficiency improvements with total electrical energy savings of 3,323,543 kWh and total natural gas energy savings of 178,896 Therms. Approximately 15% of recommended electrical energy savings and 4% of recommended natural gas savings came from low/no cost recommendations; and 85% of electrical energy savings and 96% of natural gas savings came from recommendations requiring a capital outlay (

Figure 1).

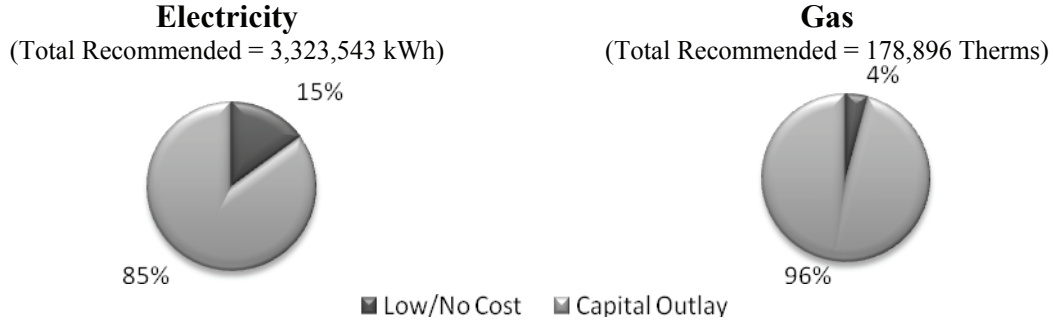

Figure 1. Potential Energy Savings from all Recommendations to National Grid Respondents

National Grid survey respondents reported implementing about one-third (32%) of total recommended electrical savings and more than half (54%) of recommended natural gas savings. Within recommended electrical energy savings measures, survey respondents reported implementing about one-fourth (26%) of low/no cost savings and one-third (33%) of capital outlay savings. Within recommended natural gas savings measures, survey respondents reported implementing less than one-fifth (17%) of low/no cost savings and more than half (55%) of capital outlay savings (Figure 2).

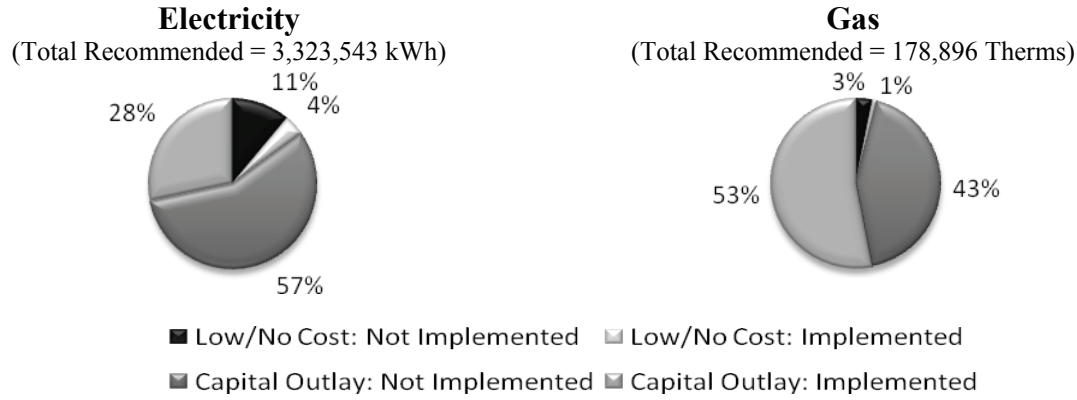

Figure 2. National Grid Recommended Measures: Energy Savings Implementations

Respondents were also asked if they implemented the recommended capital outlay measures through a National Grid energy efficiency rebate program. Based on their responses, we estimate that three-fourths (75%) of total electricity savings and more than four-fifths (84%) of total natural gas savings were derived from participation in National Grid energy efficiency rebate programs (**Error! Reference source not found.**). The respondents were not asked about any outside funding for implementing capital outlay measures not rebated by National Grid.

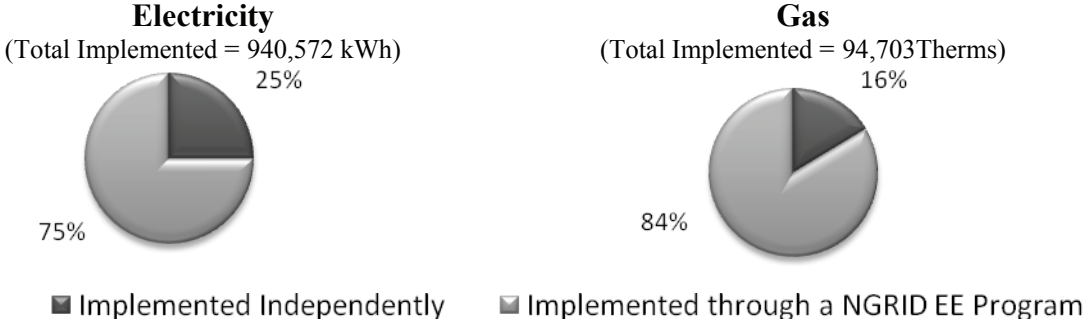

Figure 3. Capital Outlay Measures Implemented through a National Grid Efficiency Program

NSTAR survey participants received recommendations to implement energy efficiency improvements with total electrical energy savings of 7,701,484 kWh and total natural gas energy savings of 52,496 Therms. Approximately 13% of recommended electrical energy savings and natural gas savings each came from low/no cost recommendations; conversely, 87% of electrical energy savings and natural gas savings each came from recommendations requiring a capital outlay (**Error! Reference source not found.**).

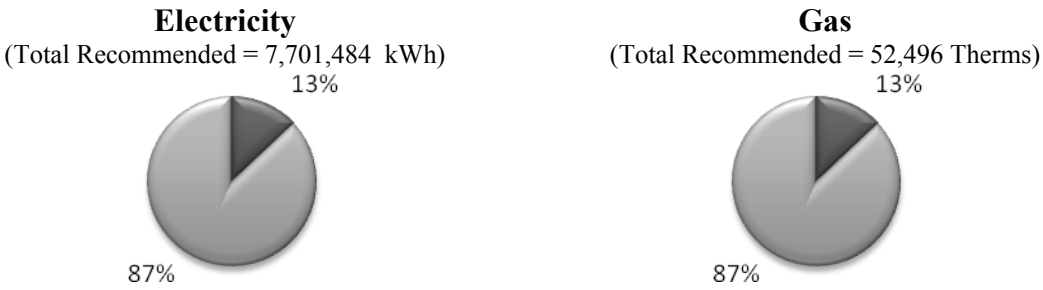

Figure 4. Potential Energy Savings from all Recommendations to NSTAR Respondents

The NSTAR survey respondents reported implementing more than half (57%) of total recommended electrical energy savings and more than one-third (36%) of total recommended natural gas savings. Within recommended electric energy savings measures, respondents reported implementing more than half of low/no cost savings (51%) and capital outlay savings (57%). Within recommended natural gas savings measures, respondents reported implementing more than half (57%) of low/no cost savings and one-third (33%) of capital outlay gas savings (

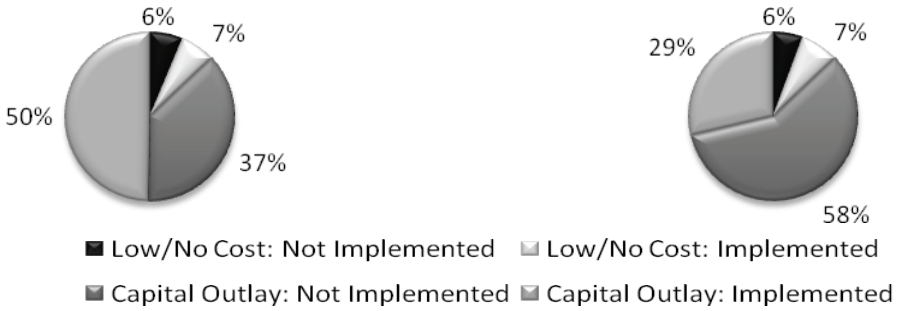

Figure 5). Note, however, that the estimates regarding NSTAR natural gas savings should be viewed with caution since the sample of NSTAR respondents account for only 3% of total recommended natural gas savings.

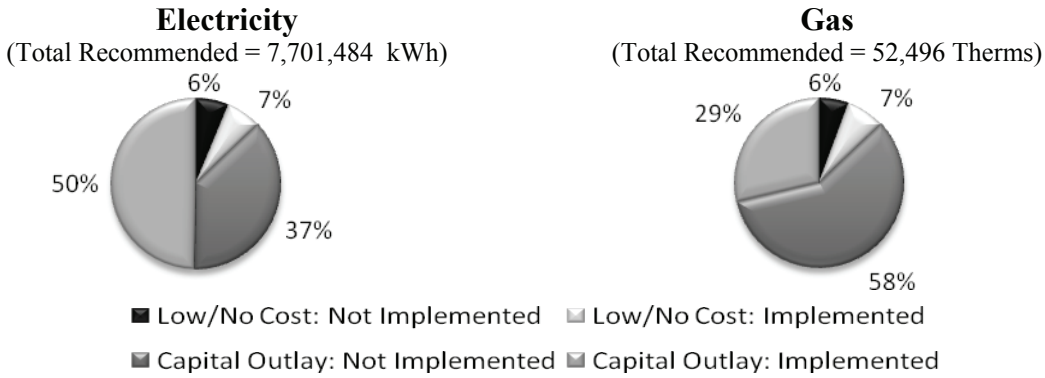

Figure 5. NSTAR Recommended Measures: Energy Savings Implemented

Respondents were also asked if they implemented the recommended measures requiring a capital outlay through a NSTAR energy efficiency rebate program. Based on their responses, we estimate that nearly half (49%) of total electricity savings and almost one-quarter (24%) of total natural gas savings were derived through participation in NSTAR energy efficiency rebate programs (

Figure 6). The respondents were not asked about any outside funding for implementing capital outlay measures not rebated by NSTAR.

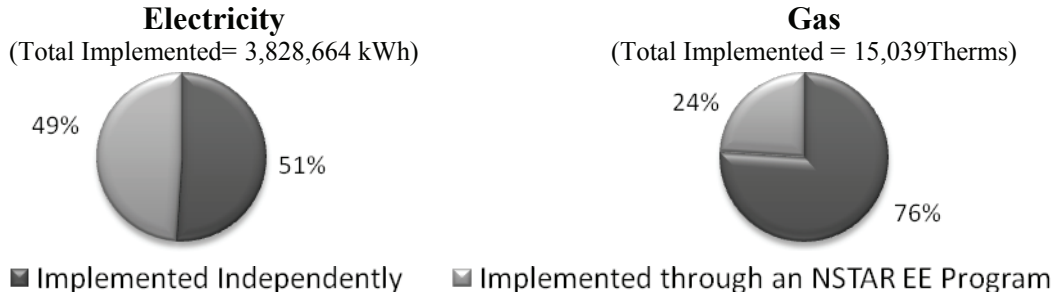

Figure 6. Capital Outlay Measures Implemented through an NSTAR Efficiency Program

Net Impact of the Benchmarking Programs

The total energy savings resulting from the benchmarking programs are a function of the measures installed by the respondents to the quantitative survey, after adjusting for free-ridership. We identified free-riders as participants who would have participated in other utility sponsored rebate programs in the absence of the benchmarking program or would have implemented energy saving measures in the absence of the benchmarking program. To determine the level of free-ridership for recommendations requiring a capital outlay, the NMR team evaluated each individual survey respondent's answers to questions regarding prior plans to implement measures, prior plans to participate in utility energy efficiency rebate programs and the influence of the benchmarking programs on their decision to participate in utility energy efficiency rebate programs.

Based on the responses to these free-ridership questions and the estimated savings provided in the technical audit reports provided by National Grid and NSTAR, we estimate that savings in the amount of 995,328 annual kWh and 92,392 annual Therms were implemented as a direct result of participation in the National Grid WBA program; and savings in the amount of 2,439,316 annual kWh and 12,740 annual Therms were implemented as a direct result of participation in the NSTAR ESB program. Without the benchmarking program, these participants would have been unlikely to participate in the utility energy efficiency rebate programs; and it therefore is unlikely that National Grid or NSTAR would have realized these energy savings. Using the total savings recommendations from technical audits and total implementation information received by survey respondents, we calculate net implementation ratios for the WBA program of 0.30 for electricity savings and 0.52 for natural gas savings; and implementation ratios for the ESB program of 0.32 for electricity savings and 0.24 for natural gas savings.[3] Applying the net implementation ratios to the total savings recommended to all participants, we project the net impact of the WBA program to be 2,693,485 annual kWh and 163,475 annual Therms and the net impact of the ESB program to be 3,659,626 annual kWh and 488,409 annual Therms (Table 2).

[3] The estimates for NSTAR natural gas savings should be viewed with caution since the sample of NSTAR respondents account for only 3% of total recommended natural gas savings.

Table 2. Net Impact of the 2006-07 National Grid and NSTAR Benchmarking Programs

	National Grid Whole Building Assessment Program		NSTAR ENERGY STAR Benchmarking Program	
	Annual kWh	**Annual Therms**	**Annual kWh**	**Annual Therms**
Recommended savings (surveyed participants)	3,323,543	178,896	7,701,484	52,496
Net impact (surveyed participants)	995,328	92,392	2,439,316	12,740
Net implementation ratio	0.30	0.52	0.32	0.24
Total recommended savings all participants	8,993,934	316,532	11,554,286	2,012,523
Projected net impact	2,693,485	163,475	3,659,626	488,409

According to the audit reports provided by National Grid and NSTAR participants surveyed received recommendations for energy savings representing a significant portion of their energy usage. The recommendations received by National Grid participants represent 11% of their annual electricity usage and 12% of their annual natural gas usage. The recommendations received by NSTAR participants represent 15% of their annual electricity usage and 7% of their annual natural gas usage. The actual implemented savings and net impact, however, represent a smaller fraction of their annual usage for both electricity and natural gas (Table 3).

Table 3. Recommendations as a Percent of Total Energy Usage

	National Grid Whole Building Assessment		NSTAR ENERGY STAR	
	Electricity	**Natural Gas**	**Electricity**	**Natural Gas**
All Recommended Savings All Respondents	11%	12%	15%	7%
Recommended Savings*	10%	11%	14%	7%
Implemented Savings*	4%	8%	9%	4%
Net Impact *	4%	7%	5%	3%

* Respondents implementing at least one measure.

Participation Motivations and Barriers

Not surprisingly, this study revealed that participants in both programs had similar motivations and barriers regarding their decision to participate. Participants are motivated to participate in the programs primarily by the promise of financial benefits and secondarily by wanting to be perceived as being "green." Staff and contractors for both programs most commonly cited lack of time and access to building energy use data needed by the Portfolio Manager software as barriers to participating in the program. They additionally observed that some customers are daunted by the program requirement that they commit to continue benchmarking participating buildings for at least a year.

National Grid Participant Motivations

Nearly all of the survey respondents (11 of 12) reported saving on energy costs or bills as the most important reason for participating in the WBA program.

All of the contractors interviewed also cited the customers' desire to reduce energy costs as their primary motivation for participation. One contractor observed that customers are very eager to participate in energy efficiency programs when annual utility rate changes are first put into effect but their interest then wanes over the course of the year. He believes this is due to property managers getting budget adjustments so that, even if the energy costs stay the same, the managers are no longer going over budget. Some of the National Grid staff members also mentioned the customers' desire to save energy and money as a primary motivation for participation. However, one staff member also noted that the desire to gain recognition for reducing the operation's carbon footprint became relatively more important as energy prices decreased (thus decreasing energy cost savings) and publicity about global warming increased.

In the in-depth interviews, program participants reported a number of secondary motivations for participation, including establishing a baseline for building energy use, becoming more efficient, and "going green." Three of four contractors that commented on customer motivations said that "wanting to be green" plays a notable role. Some of the National Grid staff members thought that customers are motivated to participate in the program by the prospect of obtaining an ENERGY STAR designation for their building or upper management wanting to assess their operations' carbon footprint.

National Grid Participant Barriers

A majority of the National Grid survey respondents (10 of 12) reported no barriers to participation in the WBA program. In the in-depth interviews, participants reported a lack of time as a barrier to continuing to benchmark facilities using Portfolio Manager. However, it is important to note that all of the participant perspectives on barriers to participation are coming from customers who were able to overcome any barriers and actually participate. Thus the contractor and staff perspectives might provide greater insight on the reasons customers may have chosen not to participate in the WBA program.

The contractors cited a variety of barriers to participation including costs—customers need to have confidence that they will see enough savings to satisfy their payback requirements; the program requirement that customers make a signed commitment to continue periodic benchmarking with the Portfolio Manager for at least a year; data-gathering requirements for the benchmarking study that can be overwhelming for facility managers; a data-gathering form that may appear intimidating to someone who is seeing it for the first time; and possible customer concerns about unacceptable or deficient outcomes of energy efficiency upgrades, such as poorer lighting or heating quality. Most of the National Grid staff members cited lack of time and money as the most important barriers to participation. They observed that customers may not have the time to gather the energy usage data required for benchmarking or to fit the audits into their schedules.

NSTAR Participant Motivations

Paralleling the perspectives of the National Grid participants, more than half (9 of 17) of the NSTAR survey respondents reported saving on energy costs or bills as the most important reason for participating in the ESB program. A couple of respondents each reported ENERGY STAR certification and "use of the benchmarking software" as motivations for participation.

NSTAR program staff also think cost savings are the primary customer motivation for program participation. Some of the program staff members as well as contractors think that customers participate in the ESB program to gain a better understanding of energy use and energy efficiency opportunities in their buildings; while a couple of other program staff members noted that customers want to be perceived as green, especially if they can get an ENERGY STAR plaque.

NSTAR Participant Barriers

Again paralleling the perspectives of the National Grid participants, the majority of the NSTAR survey respondents (14 of 17) reported no barriers to participation in the ESB program. Only three of the NSTAR survey respondents said they needed to overcome any barriers to participate in ESB; two cited a lack of time and one said that the program software was confusing and difficult to use.

Both NSTAR staff members and contractors also cited customers' lack of time and access to building energy use data needed by the Portfolio Manager software as the primary barriers to participation in the ESB program. Program staff members and contractors also noted that some customers do not want to make a signed commitment to continue benchmarking for at least a year—they are daunted by the prospect of a lot of data gathering for their facilities.

Benchmarking with Portfolio Manager

There were clear and notable differences between the two programs on the training on Portfolio Manager that was provided to participants. Fewer participants in the National Grid program received such training than did participants in the NSTAR program.

Portfolio Manager Training

Only five of the 12 National Grid respondents reported that someone on their staff was trained to use Portfolio Manager. One staff member, based on his experience with having a customer go through WBA, believes the customer is not really trained to use Portfolio Manager and the contractor operates the tool for them. This was partially confirmed by in-depth interviews with participants who reported that the program contractor performed all of the data entry for Portfolio Manager.

The majority of NSTAR respondents (13 of 17) reported that someone on their staff was trained to use Portfolio Manager and nearly all of these respondents (12 of 13) reported that the training was sufficient for them to continue benchmarking their facilities. The effectiveness of the training was further reinforced by the ratings that respondents' provided to different aspects of the value of Portfolio Manager—of all the aspects the respondents rated the "help provided by program contractors or utility staff in using Portfolio Manager" as the most valuable (see below).

Value of Portfolio Manager

The survey of program participants asked respondents to rate the value of four aspects of Portfolio Manager on a scale of one to five, where one equaled "not at all valuable" and five equaled "very valuable." National Grid respondents gave high mean ratings to "identification of energy efficiency opportunities" (4.4) and "the whole building approach of Portfolio Manager" (4.4); and relatively lower mean ratings to "help provided by program contractors or utility staff in using Portfolio Manager" (3.6) and "comparisons to other similar facilities" (3.5). Similarly, NSTAR respondents gave high mean ratings to "help provided by program contractors or utility staff in using Portfolio Manager" (3.9), "whole building approach of Portfolio Manager" (3.8) and "identification of energy efficiency opportunities" (3.7); and they gave relatively lower mean ratings to "comparisons to other similar facilities" (3.4).

Technical Audit Report

The survey of program participants also asked respondents to rate their satisfaction with six different aspects of the technical audit report on a scale of one to five, where one equaled "not at all

satisfied" and five equaled "very satisfied." Participants in both programs gave generally high overall satisfaction ratings to most aspects of the report. National Grid respondents gave every aspect of the report a mean rating of 4.0 or higher. NSTAR respondents gave high mean satisfaction ratings to "usefulness of the information in making decisions about whether to implement the recommendations" (4.3), "overall quality of report" (4.1), and "format of the report" (4.1); and they gave low mean satisfaction ratings to the "amount of new information provided" (3.5).

A National Grid contractor observed that utility staff have been present at many of the presentations of the technical audit findings to customers. He believes this is an important factor in getting customers to follow through on the recommended measures. In contrast, according to NSTAR staff and contractors, NSTAR staff have not generally attended such presentations.

Post-Participation Benchmarking Behaviors

Only five of the 12 National Grid survey respondents reported plans to continue benchmarking the facilities that were benchmarked through the WBA program. Notably, three respondents who reported no plans to benchmark their facilities in the future also reported that they did not receive training on Portfolio Manager through the WBA program. In addition, only three of the 12 National Grid respondents reported that they have already benchmarked additional facilities using Portfolio Manager and only five of the respondents reported plans to continue benchmarking the facilities that were benchmarked through the WBA program. Although another five respondents reported that they have plans to benchmark additional facilities, the expression of intent to benchmark additional facilities is questionable after having participated two or more years ago (in 2006 or 2007).

In contrast to the National Grid participants, 11of the 17 NSTAR respondents reported plans to use Portfolio Manager to re-benchmark their facilities at least once a year and eight respondents reported that they will re-benchmark twice a year or more. Only three respondents reported no plans to re-benchmark their facilities using Portfolio Manager. Eight out of 17 NSTAR respondents reported that they have already benchmarked additional facilities using Portfolio Manager. Another two respondents reported that they have plans to benchmark additional facilities—note again that the intent of those respondents that participated in the program two or more years ago (in 2006 or 2007) to benchmark additional facilities is questionable.

Participant Experience and Satisfaction

The survey of program participants asked respondents to rate their satisfaction with 12 different aspects of the benchmarking program on a scale of one to five, where one equaled "not at all satisfied" and five equaled "very satisfied." In general, both National Grid and NSTAR survey respondents reported a high level of satisfaction with all aspects of the respective benchmarking programs.

National Grid respondents gave the highest mean satisfaction ratings to "convenience of scheduled times for audits" (4.4) and "information provided about incentive programs" (4.4); and they gave the lowest mean satisfaction ratings to "information provided about incentives from other sources" (3.5),"timeliness of report" (3.9), and "outcome of program in terms of realized benefits" (3.9).

NSTAR survey respondents gave the highest mean satisfaction ratings to the "convenience of scheduled times for audits" (4.5) and "timeliness of report" (4.4); and they gave the lowest mean satisfaction ratings to "information provided about incentives available from other sources" (2.3) and "information provided about incentive programs" (3.5).

Discussion

In an environment where energy conservation programs face increasing pressures to deliver savings and as the low-hanging fruit get picked, the National Grid WBA and NSTAR ESB programs offer a comprehensive, whole-building approach that can drive deeper savings among more customers.

With comparable net implementation percentages of recommended kWh savings, both the NSTAR (32%) and National Grid (30%) benchmarking programs have been similarly effective in delivering electrical energy savings from their 2006 and 2007 program years. The National Grid program also has been effective in delivering natural gas savings, with net implementations of 52% of recommended Therm savings. The sample for this study included NSTAR respondents who account for only 3% of total recommended natural gas savings which limits the ability to develop valid projections of the effectiveness of the NSTAR program in delivering natural gas savings.

In general, National Grid's WBA program has been the more effective conduit for channeling participants to National Grid energy efficiency rebate programs. Three-fourths (75%) of the total electricity savings from implementations requiring a capital outlay are obtained through participation in National Grid energy efficiency rebate programs as compared with about one-half (49%) of total electricity savings for the NSTAR program. Additionally, National Grid survey respondents gave among the highest satisfaction ratings to "information provided about incentive programs" whereas NSTAR respondents gave among the lowest ratings to this aspect of program participation. Attendance of National Grid staff and account executives at the presentation of findings from the audit appears to be a critical factor in customer hand-off to utility energy efficiency rebate programs.

On the other hand, NSTAR's ESB program has been more effective than National Grid's WBA program in driving participants to continue benchmarking facilities. Over half the NSTAR survey respondents have already used Portfolio Manager to benchmark additional facilities, as compared with one-fourth of National Grid survey respondents. Also, more than two-thirds of NSTAR respondents reported plans to use Portfolio Manger to re-benchmark their facilities at least once a year, as compared with about two-fifths of National Grid respondents with similar plans. It is possible that as a result of the hands-on effort by National Grid implementation contractors in working with participants on the initial benchmarking process, participants are not acquiring the necessary training and experience to run Portfolio Manager by themselves. Indeed, fewer than one-half of the National Grid respondents reported that they received training on Portfolio Manager whereas about three-fourths of NSTAR respondents report receiving such training.

Both programs face a challenge of further growth, particularly in the face of increased demands for energy savings. In the case of NSTAR, the challenge is to grow the program beyond relatively modest goals that it sets for itself. Both utility programs have to deal with problems of scalability. While NSTAR could leverage its model of relying on other companies as implementers to drive growth without incurring significant increases in staff, it needs to have a better system for directing and managing the implementers. National Grid, on the other hand, has taken an approach of maintaining close control over much of the program administration and management which may set limits on the scalability of the WBA program.

Key lessons from this evaluation for other utility benchmarking programs include the following:

Critical to the effectiveness of a benchmarking program as a conduit to utility energy efficiency rebate programs is the transfer of the benchmarking program participants to the other programs. For this to happen seamlessly, it is essential that the appropriate customer account executives and maybe even staff from relevant energy efficiency rebate programs attend any presentations of findings to the benchmarking program participants.

Data gathering and input for Portfolio Manager is a chore for customers. However, when benchmarking programs seek to ease this task by having staff or contractors handle it, the customers do

not learn to do it themselves, thereby making it less likely that they will use Portfolio Manager and continue benchmarking on their own. This issue may be obviated through automated benchmarking that sets up regular downloads of usage data to Portfolio Manager. PG&E's benchmarking program includes this capability and EPA is encouraging other utilities to also adopt it.

In an environment where energy conservation programs face increasing pressures to deliver savings and as the low-hanging fruit get picked, benchmarking programs offer a comprehensive, whole-building approach that can drive deeper savings among more customers. However, benchmarking programs frequently do not have sufficient staff to meet such an increase in demands. Therefore they need to recognize that they may need to change their organizational model and they need to think about the appropriate path for them to scale up operations. Important considerations include increasing staff, engaging more contractors, and the structure for management control.

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