

# **YOU CAN'T MANAGE IT IF YOU DON'T MEASURE IT! THE ROLE OF BENCHMARKING IN NSTAR'S ENERGY EFFICIENCY PROGRAMS**

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## **Introduction**

NSTAR launched a new strategy in 2003 to enable its large commercial customers to assess energy efficiency opportunities and select cost-effective energy efficient upgrades. NSTAR has recently developed a portfolio of building performance programs that target various C&I customer sectors. The focus of these efforts is on benchmarking. Benchmarking serves as the first step in establishing a reference point and as an impetus for implementing energy efficiency improvements. As a starting point, NSTAR is using the Portfolio Manager benchmarking tool, provided by the U.S. Environmental Protection Agency (EPA) ENERGY STAR<sup>®</sup> Buildings Program.

Eligible customers will receive individual training on the use of Portfolio Manager as well as assistance in benchmarking their facility. This is coupled with a technical assessment of each participating facility. The assessment yields a customized strategy that assists the end user in prioritizing operation and maintenance improvement measures. The customer assessment also identifies specific NSTAR energy efficiency programs that can be leveraged to help buy down implementation costs, thereby accelerating the customer's cost and energy savings. In addition, this new initiative includes ongoing technical and educational support to assist participating customers in following through with the recommendations identified and pursuing opportunities that reduce the total energy consumption in their facilities.

This paper demonstrates how readily available tools from ENERGY STAR and technical field support can assist utility commercial customers. It details the steps taken to define the program parameters, the development of customer market segment selection and recruitment processes, program implementation plans, and recommendations for audience members considering replicating this program in their service territories.

## **Background and Objectives**

NSTAR is the parent company of Boston Edison, Commonwealth Electric, Cambridge Electric and NSTAR Gas. As one of Massachusetts' largest investor-owned electric and gas utilities, NSTAR transmits and delivers electricity and natural gas to 1.3 million customers in over 100 Eastern Massachusetts communities. NSTAR's service territory consists of a large metropolitan area that includes an abundance of hospitals, educational institutions, and office buildings – the same building types targeted by Portfolio Manager.

For over 15 years, NSTAR has successfully provided its customers a variety of energy efficiency programs and services. These programs focused on providing rebates for lighting, HVAC, motors and variable frequency drives, for both time dependent and retrofit opportunities. NSTAR has experienced great success with traditional rebate programs and was interested in taking their energy efficiency programs a step further. As a result, the programs were expanded to promote energy efficient operations

as well as efficient equipment, through several building performance pilots. Through these efforts, NSTAR will attempt to educate customers on how to evaluate their overall energy performance, how to determine which approach could result in the most savings for their company, and how to measure the results of their actions. NSTAR believes that their customers can accomplish this by benchmarking their buildings against the performance of similar buildings across their service territory and the country. If performed properly, benchmarking can serve as an impetus or motivator for customers to establish an energy plan and “get moving” on implementing efficiency improvements. Over time, it will allow customers to continually monitor their efforts and perform what-if scenarios.

Benchmarking generally consists of translating monthly energy consumption into common units that can be compared across similar buildings. Many building managers track the energy use at their facilities, but they often find it difficult to translate that data into useful information. To get a fair comparison of buildings, building managers must convert various fuel units (kilowatt-hours of electricity, cubic feet of natural gas, etc.) to common units, usually British thermal units (Btus), and many need to normalize data to account for building area and weather. Even if building operators have the time to calculate the Btu per square foot information, the resulting numbers generally do not provide a lot of qualitative meaning to their managers.

For this reason, NSTAR chose to partner with the EPA ENERGY STAR Buildings program. ENERGY STAR Buildings offers many tools and resources to help businesses improve their energy efficiency. One example is the ENERGY STAR Portfolio Manager benchmarking tool. Portfolio Manager is an internet-based tool that normalizes energy data for weather and building characteristics and provides an Energy Performance Rating, which is on a scale of 1-100 and is relative to the national building market. The normalization process accounts for more variables than the typical Btu per square foot calculations, and the 1-100 rating is much simpler for non-technical managers to comprehend. Buildings that score an Energy Performance Rating of 75 or greater and meet current indoor environment standards are eligible for individual recognition in the form of an ENERGY STAR building label and plaque

ENERGY STAR is well known for their efforts to encourage energy efficiency through product labeling and often partners with local and regional organizations to promote the ENERGY STAR label. NSTAR is one of the first organizations to promote the ENERGY STAR Buildings program on a local level, and both organizations expect the partnership to provide shared benefits. NSTAR is able to leverage the recognizable ENERGY STAR label and provide quality software and materials to their customers without the cost of development. The EPA does not have the resources to reach all partners, so they welcome assistance in spreading the ENERGY STAR label and messaging. The partnership also benefits end users because the standard energy management strategies developed by ENERGY STAR can help building managers communicate on similar terms.

NSTAR has designed a very unique approach to partnering with Energy Star. Through the ENERGY STAR Benchmarking Initiative (Benchmarking Initiative), NSTAR is leveraging the free ENERGY STAR benchmarking tool to help their customers assess their energy performance, while at the same time furthering the influence of the national ENERGY STAR program. NSTAR has created a new avenue to increase participation in their traditional energy efficiency programs, by educating customers on their individual needs as well as the available incentive programs. Finally, NSTAR included a site survey and ongoing technical support as a key component of the Benchmarking Initiative, recognizing that an energy performance assessment does not save energy unless customers are able to act on the information.

## Program Development

Over the past couple of years, there has been a high level of interest from commercial building owners, operators and energy managers in understanding the energy performance of their buildings. The purpose of NSTAR's Benchmarking Initiative is to assist eligible customers in becoming more energy efficient by reducing energy usage. By working closely with customers and identifying areas of improvement, this service should not only educate customers but it should increase participation in NSTAR's core efficiency programs. To assist in the development of this initiative, NSTAR hired ICF Consulting (ICF) to provide program design and implementation assistance.

### *Program Features*

In designing the offerings of the Benchmarking Initiative, NSTAR recognized the value that benchmarking can provide in assessing a building's energy performance. However, they also recognized that benchmarking does not save energy unless the customer can learn from the information and make changes to their building. The Benchmarking Initiative will help customers use Portfolio Manager to determine the rank of their building's energy performance (on a 1-100 scale) relative to similar industry facilities throughout the U.S. Once the building's performance is determined, an Energy Efficiency Opportunity Assessment (EEOA), consisting of a walk-through audit of the building will be performed, followed by a report with recommendations for specific energy efficiency improvements. The assessment report will also identify specific NSTAR programs or services that could facilitate implementation of the recommended energy efficiency improvements. The initiative will provide ongoing support as the participants monitor the impact of their improvements, benchmark their facilities, and continue to take advantage of energy efficiency opportunities. Each step in the process is described below.

- *Benchmarking Training and Support*  
Each customer receives individual training on the use of the Portfolio Manager benchmarking tool. Customers are responsible for data entry, but they receive assistance in entering utility data into the tool and interpreting their Energy Performance Rating. The initiative provides ENERGY STAR resources during the individual training, including marketing and technical information on the website, Portfolio Manager help files, and online training sessions on how to benchmark buildings with Portfolio Manager.
- *Energy Efficiency Opportunity Assessment (EEOA)*  
The EEOA consists of a brief walk-through of a participant's facility. The results of each building assessment will be summarized in a report to the participant. The report will outline opportunities for energy savings, costs and savings estimates for the recommendations detailed by fuel type, a prioritized implementation action plan, and information about specific NSTAR programs and services that will help the participant improve energy efficiency at the site. The recommendations will include low cost/no cost energy improvements and O&M strategies that are generally less expensive and more likely to be implemented quickly, resulting in an improved Energy Performance Rating. It will also include retrofit opportunities with information on NSTAR programs and services that can offer the customer financial assistance. The contents of the report will be reviewed with the customer and NSTAR will work with them to develop a plan for implementing the recommendations.

The EEOA report is not intended to be a complete audit of the building, but rather is intended to provide initial costs and savings estimates to help the customer prioritize opportunities for savings.

For more detail on specific recommendations, NSTAR can refer the customer to technical resources on the ENERGY STAR website, particularly the Building Upgrade Manual and O&M Report Series.

- *Ongoing Support*

After the EEOA, NSTAR provides ongoing assistance as the customer implements the recommendations and monitors the impact of the improvements on their Energy Performance Rating. At a minimum, this consists of monthly phone calls and/or site visits. NSTAR will continue to educate the customer on the energy management strategy and commitment to continuous improvement promoted by ENERGY STAR.

### ***Eligibility***

Initial efforts will focus on those customers that historically operate less efficient buildings and those that have had limited participation in NSTAR's energy efficiency programs. The target market for 2003 will focus on those customers that are unfamiliar with or not utilizing Portfolio Manager. This initiative is designed to apply to a single building; however, customers are encouraged to benchmark all of their buildings, inside or outside of NSTAR's service territory. A reduced level of technical support for benchmarking may be provided for additional facilities within NSTAR's service territory on a case-by-case basis.

Customers are not required to be an ENERGY STAR partner to participate, nor will customers automatically become an ENERGY STAR partner by participating in the Benchmarking Initiative. The ENERGY STAR tools and resources are available to non-partners. If the customer is interested in ENERGY STAR partnership, NSTAR can provide them with information on how to join.

Since the Benchmarking Initiative is based on ENERGY STAR Portfolio Manager, all Portfolio Manager eligibility requirements are incorporated into the NSTAR program. These requirements are outlined below.

*Space Types:* Portfolio Manager is available for the following space types: Office, K-12 School, Hospitals, Supermarkets and Grocery Stores, and Hotel/Motels. The EPA expects to add additional space types to the tool by the end of 2003, including Dormitories, Warehouses (refrigerated and unrefrigerated), Medical Office Buildings, and Post Offices. Fast Food Restaurants, Bank Branches, and Telecom are under development. The Benchmarking Initiative will include the new space types as they become available.

*Size and Occupancy:* Portfolio Manager has additional square footage and occupancy requirements that vary by space type. For example, office buildings must meet several characteristics, including the following: the gross building area must be greater than 5,000 square feet, the building must have been occupied for 11 or more of the last 12 months, and the average annual vacancy rate of the primary space must be less than 20%.

*Utility Data:* To obtain an initial benchmark rating, Portfolio Manager requires that the customer enter at least eleven consecutive months of historical utility data into the benchmarking tool for all fuels. NSTAR can assist customers with questions regarding billing data for electricity and for natural gas if the customer falls within their service territory. In other areas, the customer is ultimately responsible for gathering the required utility data.

## ***Customer Requirements***

In return for the training and technical assistance provided, NSTAR requires customers to demonstrate their commitment to improving their energy performance by adhering to the requirements below:

*Benchmarking Requirements:* To participate, customers must agree to benchmark their facility for a period of one year, preferably on a monthly basis, but no less frequently than quarterly.

*Investment Requirements:* The Benchmarking Initiative does not require, but strongly encourages customers to implement the recommended energy efficiency improvements outlined in the EEOA. Instead of requiring any investment by customers, which would discourage participation, NSTAR chose to target customers that are more likely to implement recommendations.

*Penalties for non-performance:* If the customer does not continue to benchmark their building, they are no longer eligible for technical assistance from NSTAR.

## **Recruiting**

NSTAR set a modest recruiting goal for year 1. Because of the innovative nature of the program, the training and technical assistance involved, and the fact that there is no cost to the customer, NSTAR expects to achieve this goal. For the first phase of the program, NSTAR chose not to mass market the program, so they worked closely with ICF to target the initial candidates. The following factors were considered in targeting likely participants:

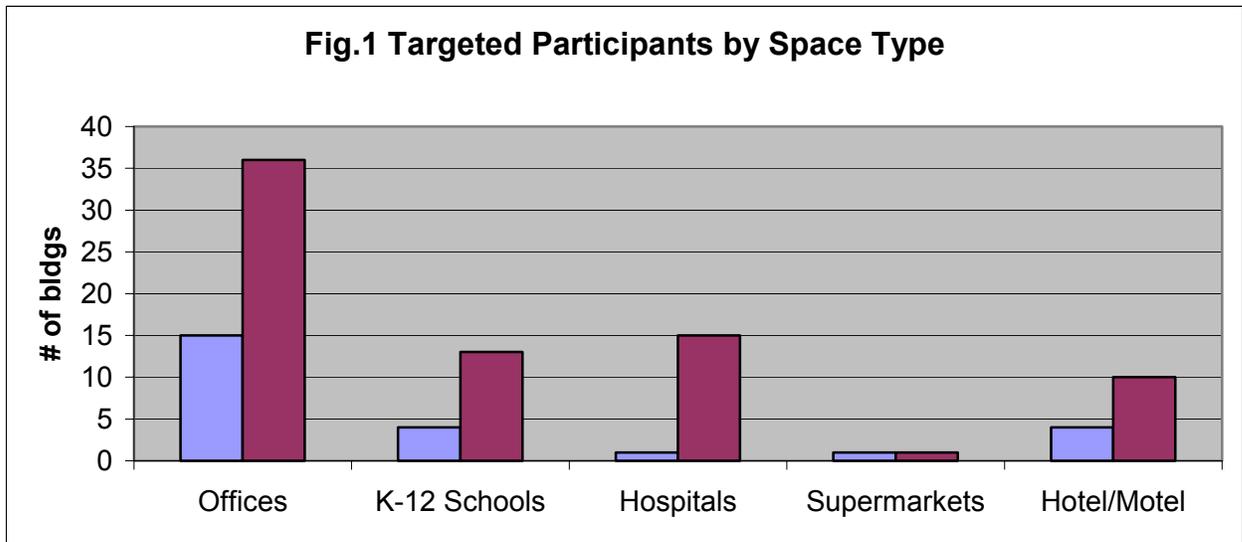
*Portfolio Manager eligibility:* NSTAR screened potential participants to determine whether they met the space type and other size and occupancy requirements. NSTAR avoided customers with difficult metering configurations, unusual occupancy patterns, or a mix of space types that would make benchmarking with Portfolio Manager difficult or impossible.

*Ownership:* NSTAR targeted either owner-occupied buildings or those buildings where the occupants could take financial responsibility for energy efficiency upgrades.

*Estimated Energy Performance Rating:* The ideal group of participants would include a mix of initial benchmarking scores. There could be some with low scores and room for improvement and potentially some with a rating of 60-70 that might qualify for the ENERGY STAR label with some minor improvement. NSTAR cannot accurately predict the initial ratings, but they can make some judgments based on their experience in the buildings.

Based on these criteria, NSTAR developed a short list of 80 potential participants for the first phase of the Benchmarking Initiative. The initiative developed some basic marketing materials, including a one-page Fact Sheet, Customer Guidelines, and a list of Frequently Asked Questions. The initiative designed the Memorandum of Understanding to match NSTAR's incentive applications with the eligibility and customer requirements incorporated into the form.

At the time of this writing, recruiting is in progress. NSTAR will share additional results during the presentation. Of the 25 highest priority customers from NSTAR's short list, 19 have expressed strong interest in the program. Figure 1 shows the distribution of space types for the initial list of candidates along with the distribution of the top 25.



### **Implementation**

As soon as each customer signs the Memorandum of Understanding, NSTAR will schedule an individual benchmarking training session. Once the customer establishes their initial Energy Performance Rating for their building, NSTAR will schedule the Energy Efficiency Opportunity Assessment visit. At the time of publication, no implementation activity has occurred. NSTAR will share results during the presentation.

### **Program Assessment**

NSTAR will consider the program effective if it expands the number of buildings benchmarked in the service territory, helps customers understand their energy performance, helps NSTAR understand its customers, results in measurable kilowatt-hour savings for participants, and increases participation in NSTAR's efficiency programs.

To measure effectiveness of the initiative, NSTAR will track the number of customers and total building area benchmarked through the initiative. NSTAR will use the initial Energy Performance Rating of the participants as a baseline and monitor any changes to the rating and resulting energy savings. NSTAR will also track participation in efficiency programs that results from the initiative.

NSTAR expects that changes to the Energy Performance Rating of the participants will depend strongly on the initial energy performance of the buildings. Participants with a low Energy Performance Rating may have more opportunity to improve their performance and will likely achieve higher energy consumption savings. Participants with a higher Energy Performance Rating may not be able to achieve the same energy consumption savings, but small changes in energy consumption can result in larger changes in the benchmarked rating given the nature of the Energy Performance Rating distribution.

A key element of any program is evaluation. NSTAR will evaluate the effectiveness of the program after 6 months using metrics previously developed. The results of the assessment will be provided in a report to NSTAR, along with recommendations for overcoming program shortcomings or challenges.

The assessment report will form the basis of expanding the program to include additional NSTAR customers. ICF will work with NSTAR to prioritize key accounts, customer segments, or other criteria to roll out the program in phases to each new group. As needed, marketing, outreach, technical and training materials will be modified or adapted for each new group to be targeted, and new materials will be developed as needed. This task may also include updating or modifying the assessment metrics and processes for the program, and setting new goals and milestones. Program assessments will continue to be conducted at least annually.

### **Recommendations and Conclusions**

After completing the design phase of the Benchmarking Initiative and becoming more familiar with the tools and resources provided by ENERGY STAR, NSTAR would recommend partnering with the ENERGY STAR Buildings program in promoting energy efficiency efforts. The resources provided are extremely useful and help develop a common language around energy management strategies in commercial buildings.

While benchmarking is a useful tool it will not generate energy savings on its own. It simply provides customers a way to manage their efficiency plan and measure its success. For other organizations interested in promoting benchmarking to achieve energy savings, NSTAR recommends that you do so in conjunction with some type of energy efficiency recommendations or actions.

Based on experiences with the program development and preliminary recruiting for the Benchmarking Initiative, NSTAR expects customer participation rates to be high, and the education provided to be very valuable. Because the program is new and untested, NSTAR is refraining from making any predictions regarding energy savings and will evaluate results as the initiative proceeds.