Experience Tapping the Conservation Resource in the Commercial and Industrial Retrofit Market: Refined Approaches

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Since 1989, the New England Electric System companies (collectively New England Electric or the "Company") have offered a comprehensive retrofit program for commercial and industrial (C/I) customers called Energy Initiative. Based on lessons learned from four other demand-side management (DSM) programs geared toward the same market, this program was designed to achieve significant cost-effective energy conservation in existing C/I facilities by reducing or eliminating many of the market barriers that discourage customers from pursuing conservation opportunities. Since its inception, the program has achieved annual energy savings of over 249 GWH and a total summer demand reduction of approximately 81.8 mW.

In January 1991, the Company made a number of changes to Energy Initiative to improve the program's market penetration and to achieve a higher level of comprehensiveness in the measures that were installed in customers' facilities. The most significant of these changes was an increase in incentives to cover both the material and labor costs of eligible equipment. The response to this change in incentives was overwhelming. Through March 1991 the Company had received over 5,000 applications, representing total costs of roughly $62 million. These costs exceeded the program budget by over 120%, forcing the Company to suspend the acceptance of new applications through the end of the year.

In response to the 1991 results of Energy Initiative, the Company made further refinements to the program for 1992 including changing incentives to include a year to a year and a half payback depending on the particular end-use. It also restricted the program solely to retrofit measures. The program opened in late February and early March in the different service territories served by the Company's retail affiliates. Within the first two days after opening, over 1,940 applications were received representing requests for rebates that exceeded the budget of $11.9 million for new business in 1992 by 164%. Consequently, the Company's affiliates each stopped receiving applications for the program within approximately one week after the program was opened.

This paper will focus on the 1991 and 1992 results of Energy Initiative, addressing specifically reasons for the extraordinary response rate, the types of measures installed and the actual demand reductions and energy savings achieved. In addition, the paper will discuss lessons learned from four years of experience with Energy Initiative regarding penetrating the C/I retrofit market.

Introduction

In 1989, New England Electric introduced a comprehensive conservation retrofit program for existing commercial and industrial (C/I) facilities called Energy Initiative. This program incorporated four years of experience from a number of other programs geared toward this market. At the time, the Company was facing a tight capacity situation which required it to consider all available new resources, particularly those that could provide capacity with minimal lead time. Consequently, the Company began to aggressively tap the conservation opportunities in the C/I sector. In 1989, the Company invested $40 million in conservation, an increase of 70% over the previous year's investment. Of this investment, approximately 25% was devoted to tapping the conservation potential in existing C/I facilities. Energy Initiative was designed to aggressively penetrate the C/I retrofit market by eliminating many of the market barriers that prevented customers from pursuing conservation on their own. Large financial incentives, technical assistance and a streamlined application process were a few of the major design components of the program that were geared to achieve a high level of participation among the Company's C/I customers. The program's goal was to both attract large numbers of customers and to encourage customers to pursue all cost-effective conservation opportunities in their facilities over time. This approach would enable New

England Electric to achieve all the maximum cost-effective conservation potential within its customers' facilities in a strategic and comprehensive fashion.

Since its inception, the program has met the annual energy savings and demand reduction goals set for it and has proven that it is an effective mechanism for quickly tapping the conservation potential in the C/I retrofit market. In 1991 the program achieved such a high level of market penetration that the entire budget was exhausted within three months after the program's introduction. Despite refinements to the program for 1992, the program again achieved significant results and exhausted its budget within two days. This paper explores the causes of the oversubscription in Energy Initiative and the lessons learned from fours years of experience with the program.

Overview of New England Electric

New England Electric is a holding company that owns three major retail electric companies including Massachusetts Electric Company, The Narragansett Electric Company in Rhode Island, and Granite State Electric Company in New Hampshire. Together, these companies serve 1.1 million residential, 124,000 commercial and 7,000 industrial customers representing total energy sales of 20,470 GWH. The combined 1991 summer peak demand for the Companies was 4,250 MW.

New England Electric has ambitiously pursued conservation and load management during the last six years. Since 1987, the Company's investment in demand-side management has increased from $12.7 million to over $100 million dollars in 1992. Through December 1991, the Company had achieved from its demand-side management programs a total of 566 GWH of energy savings and a summer peak-demand reduction of 234 MW.

Overview of Program Design

Energy Initiative is an energy conservation program designed to improve the energy efficiency of electrical equipment in existing C/I facilities. The program provides both financial and technical assistance to customers to assist them in identifying, purchasing and installing high efficiency equipment. Financial assistance is provided in the form of rebates which are designed to cover a major portion of the energy efficient equipment and installation costs. Two types of rebates are available. Prescriptive rebates are fixed amounts of dollars per unit of a particular measure. These prescriptive rebates are available for measures commonly found in large quantities in commercial and industrial facilities. They are available for measures that have relatively constant energy savings and demand reductions per installation for a wide range of applications. End-uses for which fixed incentives are available include measures such as interior and exterior lighting equipment, high efficiency motors, variable speed drives and food process measures. The benefit of fixed incentives per measure unit is that they allow customers to avoid having to conduct extensive engineering analyses to determine the cost-effectiveness of individual efficiency options. In addition, prescriptive rebates help customers easily calculate the size of the financial support they can receive for the installation of specific measures, thereby helping overcome the financial barriers that prevent many customers from proceeding with efficiency improvements in their facilities.

Custom measure rebates are the second type of rebate offered. These rebates enable customers to receive rebates for all electric retrofit equipment for which fixed unit rebates are not available (i.e., process equipment). Custom rebates are calculated individually for each measure and are based on estimates of the energy savings of the measure at different time periods over the measure's life. The objective of this approach is to offer customers the opportunity to receive financial assistance for the installation of any cost-effective retrofit conservation opportunities in their facility.

Technical assistance is available to customers to help them identify conservation opportunities within their facilities and to analyze the associated energy savings potential. In cases where technical assistance is deemed appropriate for a particular customer, New England Electric will provide funding to hire a consultant with expertise in the particular end-use being explored. After the consultant has completed the analysis he then makes specific recommendations to the customer for the equipment to be installed along with an estimate of the cost of the equipment and the rebate available from the utility.

In an effort to achieve greater comprehensiveness in retrofits of electrical equipment in customers' facilities, the Company is in the process of developing a new comprehensive technical service called the Comprehensive Conservation Service (CCS). This service begins with a building information questionnaire which is completed for the facilities of all participating customers. The questionnaire identifies efficiency opportunities in different end-use categories and determines the level of technical assistance required to assess the magnitude of the savings. The goal of this service is to develop a record of the efficiency opportunities within customers' facilities and to start these customers on a track toward comprehensive efficiency upgrades.

To market the program to customers, the Company has 32 conservation and load management field representatives who actively work with customers to encourage their participation in the program. Each representative has a group of customers who they serve on a continual basis. They meet periodically with the customers to explain the services provided by the Company through Energy Initiative and other DSM programs, assist the customer in identifying major conservation opportunities in their facilities, where necessary arrange for a vendor or consultant to provide technical support and assist in the completion of program applications so the customer can receive the appropriate rebates. These representatives are the primary contact customers have with the Company on conservation and load management-related issues.

A critical component in the marketing of the program is the large network of equipment vendors such as lighting and motor vendors and electrical contractors in the Company's service territory who actively promote the program. Approximately 430 vendors, all of whom have participated in a vendor training program, are involved in marketing Energy Initiative. These vendors work directly with customers to identify conservation opportunities and provide the expertise to determine the appropriate high efficiency equipment to install. Once a vendor has specified the appropriate equipment, he then works with the customer to complete an application form which is then submitted to the utility for processing. These vendors and contractors have been extremely effective in disseminating information about the program to the Company's customers and in assisting customers to take advantage of the financial and technical assistance offered by the program. The advantages of tapping into the vendor network are threefold. First, the sheer number of vendors in the company's service territory offers a marketing force larger than any the Company could support on its own. Second, they have close working relationships with many customers who they have served in the past. Third, they have expertise in identifying conservation opportunities and in selecting the appropriate high efficiency replacement equipment. These services, which would otherwise have to be purchased from energy conservation consultants, are provided at no cost from the vendors.

Energy Initiative is geared toward serving a large number of customers per year and working with these customers over time to achieve a comprehensive treatment of their conservation opportunities. As emphasized above in the description of CCS, the program goal is to achieve comprehensiveness in a staggered approach by encouraging customers to pursue relatively straightforward conservation retrofits such as a shift to high efficiency lighting and then to move over time to more sophisticated retrofits such as variable speed drives and HVAC. This approach helps customers overcome their hesitation or reluctance to pursue conservation with minimal risk on the customer's part. Once customers gain confidence in the utility program, and in the benefits of energy efficiency, they are then more likely to pursue other opportunities in their facilities. The Company has found in its years of implementing Energy Initiative that it is more successful in achieving comprehensive retrofits by promoting this staggered approach rather than attempting to encourage customers to retrofit all electrical equipment at one time.

1991 Experience

In 1991, a number of changes were made to Energy Initiative, the most significant of which was a shift to full cost rebates for prescriptive measures including motors, lighting, HVAC equipment, adjustable speed drives and building shell measures. The decision to move toward full-cost rebates, including both material and labor costs, was based on two factors. First, the Company interpreted an order (Order 89-194)[1] issued by the Massachusetts Department of Public Utilities in March 1990 to mean that it should offer rebates that equal the full cost of measures, including material and labor costs, unless the utility had proof that offering smaller rebates would not adversely affect customer participation levels. Second, the Company wanted to tap all conservation opportunities within its customers' facilities and felt that full cost rebates would assist in achieving this goal.

The program was introduced in January 1991 with a budget of $28.2 million. With this budget, the Company's goal was to achieve 19.1 MW of summer demand reduction and 60,498 MWH of annual energy savings. Through March 1991, the Company had received over 5,000 applications representing roughly $62 million of incentives. As a result of this overwhelming response to the program, the Company temporarily suspended the acceptance of new applications on March 25, 1991. The Company then considered a number of alternatives for dealing with the oversubscription to the program. After discussions with the regulatory commissions in the states served by the Company and with customers, the Company decided to honor all applications that had been received and to accept no additional applications for the year. In May, the Company began preinspecting customers facilities to determine if the recommended equipment was appropriate and approving payments for equipment installation. By the end of 1991, over 4,900 applications had been processed for total payment of $42 million. These expenditures resulted in approximately 43.2 MW of

summer demand reduction and 132,811 MWH of energy savings. Table 1 shows a breakdown of the savings achieved by measure. An additional $15.8 million of applications were carried over into 1992 for payment.

The 1991 results of Energy Initiative were both positive and negative. On the positive side, the results as shown in Table 1 clearly illustrate that significant energy savings can be achieved in the C/I retrofit market and that the program's design could effectively tap this resource. In fact, the design was so effective that it significantly overstimulated the market. The primary factors leading to this overstimulation were most likely the combination of the full-cost rebates and the high level of vendor participation. The high level of rebates made it relatively easy for vendors to encourage customers to install high efficiency equipment because, in most cases, the customer would incur minimal, or no, expenses for the equipment. On the negative side, the program greatly exceeded its budget. In addition, the program remained operational for only three months when it had been designed to be available to customers throughout the year. Thus, many customers were frozen out of the program and were not able to participate. This inability to participate caused some dissatisfaction among customers and vendors who had planned energy efficiency projects counting on financial support from the utility.

As Table 1 illustrates, the actual energy savings and demand reduction achieved through the program were skewed toward lighting. Approximately 73% of the energy savings was tied to the installation of a wide range of lighting equipment, while the remaining 27% of the savings was associated with other retrofit measures. These results compared to the Company's goal of achieving 72% of the expected savings through lighting. On the other hand, roughly 83% of the demand reduction was achieved through lighting as compared to the Company's goal of 62%. In its effort to achieve greater comprehensiveness in the retrofits of customers facilities, New England Electric has sought to increase the savings and demand reductions from non-lighting measures as compared to the results of the program in 1989 and 1990. These results suggest that while the Company's diversification efforts were successful from an energy savings perspective, they did not reach their goal from a demand reduction perspective.

1992 Experience

In response to the results of Energy Initiative in 1991, the Company made further refinements to the program for 1992. First, it limited the program solely to retrofit measures which would be installed in place of existing, operating electrical equipment. This change left

Table 1. Energy Initiative 1991 - Project and Actual MWH Savings and kW Reductions

	MWH Savings			kW Reduction		
Measure	Projected	Actual*	% of Total	Projected	Actual*	% of Total
Lighting	43,308	96,440	73%	11,864	35,831	83%
Motors	3,990	4,914	4%	1,130	1,392	3%
VSD	1,816	1,970	1%	632	721	2%
HVAC/ Refrigeration	7,025	28,025	21%	4,624	3,320	8%
Process Measure	4,359	1,462	1%	872	1,898	4%
Total	60,498	132,811	100%	19,122	43,162	100%

*Preliminary figures before evaluation.

prescriptive rebates only for lighting, motors, process equipment and food service equipment. Other retrofit measures for which prescriptive rebates were not available could go through the custom measure approach. Second, the Company revised rebates to include a one and a half year payback for lighting and a one year payback for motors to encourage more buy-in from the customer and to assure that the Company was not paying more than it needed for retrofit measures. Third, a vendor training program was implemented to assure that all vendors participating in the program were properly trained in the program procedures. Fourth, a comprehensive application tracking system was developed and implemented to give the Company more control over the program.

The program was introduced on February 21, February 28 and March 2 in the service territories of Narragansett Electric, Granite State Electric and Massachusetts Electric respectively with a total budget of $11.9 million. Within the first day, the program was oversubscribed in Rhode Island and Massachusetts and was closed on the first and second day in each state respectively. The program was closed in New Hampshire approximately one week after it opened. The primary reason for closing the program was that the applications received represented requests for rebates of $31.4 million, exceeding the budget for new 1992 applications by 165%.

This second oversubscription to Energy Initiative is attributed to a number of different factors. First, there was a significant amount of pent-up demand for the program as a result of the closing of the program in March 1991. Many customers who were on the verge of submitting applications were shut out of the program in 1991 and were waiting for the program to reopen in 1992 to receive rebates for their retrofit measures. Second, the program drew a tremendous amount of activity from vendors and electrical contractors who had seen much of their non-Energy Initiative-related work disappear as a result of the strong recession in New England. The program represented a large source of potential work and income for these contractors. Third, customer awareness was high since the program has been actively marketed for three years. Fourth, the Company believes that the cost of certain measures may have dropped between the time the rebates were established and the program was introduced. This drop may have caused a decrease in the size of the customer contribution for the installation of these measures which would have made such measures easier for the vendors to sell. These factors, when combined with the program's financial rebates, were most likely the cause of the huge demand for the program.

While it is still too early to evaluate the results of the 1992 program, the magnitude of the dollars associated with the applications received and the distribution of applications received suggest that the lion's share of energy savings and demand reductions will once again be associated with lighting. Of the $31.4 million of requested rebates, 74% were associated with lighting, 22% with motors and 4% with process, food and other efficient equipment. This emphasis on lighting is attributable to the possibility that the lighting rebates may still be too high and that as stated previously, customer contributions may be lower than expected, making lighting jobs easy to sell. Early results clearly suggest that for lighting equipment and premium efficiency motors, further reductions in rebates beyond those introduced in 1992, would have been warranted. In fact, discussions with many program participants after the program was closed in March showed that they would have accepted lower rebates. The results also show significantly higher requests for rebates for motors than had been originally budgeted, suggesting that the program has begun to actively stimulate the motor market as well as the lighting market.

From a comprehensiveness perspective, the results do not suggest the Company has moved significantly closer to achieving its goal of comprehensive retrofits on a large scale. However, because the program was closed shortly after opening, these results are probably biased toward the less complex, low-cost installations such as lighting as opposed to process equipment installations. As a result they may not be truly reflective of the results that would have been achieved had the program been operational through the remainder of the year.

To avoid going over budget in 1992, the Company chose a number of different strategies for dealing with the oversubscription to the program, all aimed at bringing the dollar amount of the applications received down to the actual budget level. These strategies varied slightly among the three retail subsidiaries of New England Electric depending on the magnitude of the oversubscription. For example, in Rhode Island, one strategy involved applying a cap on the rebate dollars paid to any one customer. In Massachusetts where the oversubscription was the largest, the Company chose to negotiate with customers on both rebate levels and the scope of their applications. Massachusetts Electric's conservation and load management representatives met with all customers with applications over $10,000. The representatives asked these customers to prioritize their applications and to consider paying a higher customer contribution for the equipment being installed. The representatives were successful

through these negotiations in dropping the amount of requested rebates from $27 million to between $12 and $13 million.

These negotiations with customers resulted in a number of interesting findings. First, most customers appreciated the opportunity to negotiate with the Company on the applications they submitted. They preferred to have flexibility in the applications with which they chose to proceed as opposed to being told which applications would be accepted by the Company. This finding showed the importance of maintaining strong relationships between utility representatives and customers. Second, many customers were willing to accept a higher level of customer contribution for the equipment being installed in their facilities. While this finding was determined under unusual circumstances, it suggests that full cost rebates are often not required to encourage customers to install high efficiency equipment. Third, some customers stated that they were not able to accept a higher customer contribution because they had not planned for the expenses in their current budget. Had they been able to plan in advance, such capital expenditures for efficiency equipment would have been feasible.

Lessons Learned

In Penetrating the C/I Retrofit Market: A Comprehensive Approach,[2] the author summarized a number of lessons that had been learned from the first year and a half of implementation of Energy Initiative. Since then, two additional years of program experience with Energy Initiative have shed further light on tapping the conservation potential in existing C/I facilities. These lessons are addressed below.

a. Designing the Proper Rebate Structure: Properly setting rebates in Energy Initiative to enable the program to reach high penetration without paying more than necessary has been the most challenging task in the program. When the program was first introduced in 1989, incentives covered roughly 40 to 60% of the cost of the retrofit equipment. While the Company achieved its annual goal for the program, most of the savings achieved was in lighting. To improve the program's ability to achieve conservation opportunities across all retrofit measures not just lighting, the Company raised its rebates to cover the full cost of energy efficient equipment in 1991. This change, along with several other factors including a significant increase in vendor participation, were the main causes of the oversubscription in 1991. As Table 1 shows, most of the savings were still associated with lighting. In 1992, further refinements to incentive levels involving a shift to customer contributions of roughly a year to a year and half payback depending on the end-use again resulted in a substantial oversubscription. While the percentage of rebates requested for motors, out of the total rebates requested in the program, rose to 22% from the 1991 level of 6%, again the large majority of the rebates were for lighting.

New England Electric's experience clearly shows the challenge of establishing the correct rebate levels and illustrates a number of important issues concerning setting rebates. First, it is nearly impossible to determine the "perfect" rebate level for each measure that will allow a maximum level of penetration in a particular market sector and provide the largest savings per program dollar spent. Every DSM planner dreams of having sensitivity curves that will show the level of penetration at different levels of rebates. Such curves are difficult to determine because of the myriad factors that affect penetration. Some of these factors include the way a program is marketed, the length of time a program has been in place, and the condition of the local economy. For example, it is likely in the case of Energy Initiative that the 1989 and 1990 rebate levels would achieve a significantly higher level of penetration today than they did back in 1990 because of the level of vendor involvement helping to market the program, increased customer awareness and the downturn in the economy.

Second, full-cost rebates that cover both equipment and installation costs are seldom required in a retrofit program. One of the main problems with full-cost rebates is the actual determination of the full cost. Most energy-efficient equipment is manufactured by a number of manufacturers, who offer different list prices. In addition, each dealer may sell the equipment at a different discount rate off list price. Therefore, the full cost is not one cost but rather a range of costs. Thus, regardless of what rebate level if chosen, there is a strong likelihood that you may actually pay more for some measures than they actually cost. New England Electric has found that some vendors, even if their price is below the rebate level, will increase their prices so they can get the full rebate and earn additional profit. This problem, if not carefully monitored, has the potential to introduce a significant inefficiency in a program design. Another problem with full cost rebates is that they do not require any customer buy-in. If a customer has to pay for some percentage of the cost of the equipment no matter how small, it is likely that they will then better maintain it and recognize its benefits.

Third, different approaches to setting rebates should be used for different measures. For example, a two year payback may be appropriate for some measures while a year payback may be appropriate for others. Shorter paybacks may be required to help overcome market

barriers that are specific to a particular end-use. For example, due to a variety of factors, customers are much less likely to install variable speed drives than they are to install lighting measures. These factors range from a lack of familiarity with the technology to unsatisfactory performance of the equipment in the past. The selective application of rebates covering different percentages of equipment cost to various efficiency measures based on market barriers associated with each measure should be favored in place of the traditional path of applying the same rebate approach to all measures. In setting the 1992 incentive levels, New England Electric chose to incorporate a one and half year payback in its lighting rebates because past experience showed that there was an extremely high demand for energy efficient lighting through the program, whereas a year payback was incorporated in motor rebates because the Company has been less successful in promoting motors in the past.

b. Ongoing Market Research: New England Electric's experience with Energy Initiative also shows the importance of incorporating mechanisms in a program's design that will allow the utility to keep in close contact with the key parties involved in program implementation to constantly obtain market research data that can help in program refinement. This contact should take three forms. First, it should allow for continual feedback from customers on their acceptance of the program and their needs for conservation services. Second, it should tie into the vendor network to understand clearly how they are operating within the guidelines of the program and how they are interacting with customers. Third, it should provide for direct lines of communication between the Company's field representatives who are actually implementing the program and the individuals who are planning and evaluating the program. Some of the information that should be gleaned from these sources include the following: how equipment costs are changing and whether equipment rebates should be adjusted accordingly; what equipment customers are installing themselves in their facilities; how vendors are marketing the program to customers; what state of the art technology is entering the market on a commercial level; and whether vendors are financing equipment installations in customers' facilities. Developing a formal information network at the time a program is implemented, emphasizing heavily the importance of maintaining a close rapport between all parties involved in the implementation of a program, is critical for achieving maximum efficiency in program operations. Complementing this network should be a clear plan stating to the fullest extent possible the type of information that will be obtained.

This form of market research has played an increasingly important role in Energy Initiative. Ongoing contact with customers and vendors has resulted in both short and long-term refinements to the program. For example, this contact has provided information on product availability that has allowed the program planners and implementors to adjust the program's design so that it continually promotes the "state of the art", commercially-available lighting technologies. The Company has found that such market research must be extremely time-sensitive because the markets targeted by DSM programs, particularly commercial and industrial programs, are so dynamic, and that mechanisms must be in place to gather the information quickly and incorporate it into a program's design immediately.

c. Allowing Time for Proper Program Design and Refinement: In implementing major DSM programs such as Energy Initiative, it is critical to devote sufficient time to designing the programs and second, to give programs once they are implemented a chance to run their course. In developing new programs, it is important that utilities not rush into implementation before they have had the opportunity to conduct extensive research on experience other utilities have had with various approaches to tapping the conservation opportunities within the targeted sector and to carefully evaluate their options. This point seems blatantly obvious; however, there has been a tendency in the DSM field by some utilities and other involved parties to push new programs out the door before they have been adequately designed. In the case of Energy Initiative significant time was devoted to the development of the original program design which allowed for the incorporation of almost four years of experience gained through the implementation of other DSM programs by the Company.

The same approach should be applied to making refinements in program designs. It is critical that programs be allowed to operate for at least two years before drastic changes are made to the design, unless of course, there are major operational problems. A minimum of two years is required to allow for the ramp-up of a program and for adequate data to be collected through mechanisms such as process and impact evaluation to determine the program's strengths and weaknesses. Again, it is common for utilities to make frequent changes to programs without sufficient data to support these changes. As a result, it is seldom possible to determine what program components worked and which did not. For example, in 1991, it may have been advantageous for the Company to delay introducing higher rebates to see whether the impact of the 1990 rebates would have gained momentum. It is possible

that as vendors became increasingly more involved in the program and as customer awareness of the program increased, the 1990 incentives may have been successful in reaching the 1991 program goals without the oversubscription that resulted.

d. Application Tracking: An open enrollment program such as Energy Initiative has the potential to bring in thousands of applications per year. In 1991, over 5,000 applications were received in Energy Initiative while in 1992, over 1,900 applications were received before the program was closed. For budgetary and program control reasons, it is important that a database system be in place which can track all these applications on a timely basis. This database should enable program administrators to determine on a daily or at most a weekly basis information including: the number of applications received; the total dollar value of these applications; the quantity of each measure requested; listings of customers who have requested rebates; names of participating vendors; and estimates of the demand and energy savings to be obtained through the applications received. Such systems are costly, complex and time-consuming to develop, yet they are imperative for the proper implementation of large scale, multi-million dollar DSM programs.

New England Electric has developed two such databases. The first is its master database developed using a well-known relational database software package. All end-use specific worksheets that are submitted with each application have identical input screens and as each application is received, the information is entered directly into the database. Numerous standard reports can then be accessed to obtain summaries of the application information. This system is enormously complex because of the intricacies of the program worksheets; however, it provides direct access at any time to information associated with all applications received in the program and therefore, serves as a critical tool for controlling the program.

The second database is an interim system and resides in a simple computer spreadsheet. This system was developed because the master database was not fully operational at the time the Company introduced Energy Initiative in 1992. Despite its simplicity, it provides information on the total number of applications received by measure, the dollar value of these applications, and the names of all participating customers and vendors. This database played a major role in the management of the 1992 oversubscription.

The creation of a database can require a significant amount of planning, software development time and funding. Such time requirements and costs are critical to address in the development of a new DSM program.

e. Maintaining Program Control: Several of the major refinements to Energy Initiative in 1992 involved introducing specific mechanisms that would allow the Company to maintain financial control over the program. The 1991 oversubscription clearly illustrated the need for such control mechanisms. Under the 1991 terms and conditions of the program, the Company felt obligated to serve the applications it received even though their dollar value significantly exceeded the program budget.

To help minimize the chance of cost overruns in 1992 and to enable them to be controlled if they did occur, the Company made two changes. First, it set a firm budget cap on the dollars that could be spent on rebates in 1992. All parties involved in the program, including vendors, were informed of this cap. The program was designed to stay open until applications reached the cap. Second, the Company changed the program's Terms and Conditions to state that the acceptance of applications did not entitle a customer to guaranteed participation in the program. Only the approval of applications by the Company assures participation. This change was made to properly set customers expectations so they would recognize that the submittal of an application did not guarantee they would receive the requested rebates. This condition of the program also gave the Company some flexibility in how it could deal with an oversubscription if one occurred. And in fact, it gave the Company the ability to negotiate with customers on the applications submitted in 1992.

f. Achieving Equity Among Customers: As mentioned earlier, one of the major advantages of Energy Initiative is that it allows a large number of customers to participate on an annual basis. This aspect of the program is important because the program costs are spread across all C/I customers through a surcharge on their electricity bills. If customers are required to pay a surcharge on their kWh rates, it seems only fair that over the lifetime of the program, all customers have the opportunity to participate. One problem with the program however, is that this open enrollment, in tandem with a number of other factors, has led to the significant oversubscription in the past two years. This has necessitated program closings that have detracted from the stability of the program and its availability to all customers. One possible solution to the oversubscriptions would be to limit the number of customers who could participate annually and devote the program funds to pursuing the conservation potential in a limited number of customers' facilities in a comprehensive fashion. Several utilities including Northeast Utilities through their Energy Action Program have pursued this route. Of course, a disadvantage to this approach is that many customers do not have the opportunity to participate in any one year or for several years, exacerbating concerns about customer cross-subsidization.

The challenge is to find an alternative approach that may lie between the open enrollment approach used in Energy Initiative and the customer-limited approach used by several other utilities. A promising option would be to further reduce the prescriptive rebates in Energy Initiative, require utility C/LM representatives to market Energy Initiative as a service to customers and require all participating customers to follow the procedures of the Comprehensive Conservation Service described in the Overview of Program Design section. The first two steps would reduce the possibility of program oversubscription. Reducing incentives further would enable the Company to achieve more savings for the same dollar amount. Increasing C/LM representative involvement in marketing the program would help build the critical rapport between the utility and customers, would help control the number of customers participating in the program and could possibly lead to better quality installations. Finally, requiring participation in the Comprehensive Conservation Service would assure that all cost-effective conservation opportunities within a customers' facilities would be identified.

Undoubtedly, other alternatives to the options described above exist. The challenge is to maintain equity among customers while at the same time achieving the maximum cost-effective energy savings at the lowest cost. Energy Initiative, while clearly not the solution to this challenge in its current design, provides a useful framework which, with several significant structural changes, might offer a promising path.

Conclusion

New England Electric's experience with Energy Initiative has shown that the program as designed can be used as a tool for achieving significant demand and energy savings in a short period of time. The combination of prescriptive rebates, the simple, straightforward application process and the extensive support from the network of vendors served as an effective conduit for tapping the conservation potential in existing C/I facilities. In the first three years the program was offered, it achieved annual energy savings of over 249 GWH and a total summer demand reduction of 81.8 MW. Such savings clearly show that significant energy savings potential exists within the C/I retrofit market and that with the proper program design, it can be mined. As this paper has discussed, effectively mining this potential requires careful consideration of a number of different program design components.

While Energy Initiative was successful in achieving its goals for energy savings and demand reductions, the oversubscriptions that resulted in the program in the last two years suggest that a number of refinements are required for it to be a viable for the future. New England Electric is currently investigating all its options for refining the program. Several of these options include reducing rebates for eligible energy efficient equipment, incorporating different mechanisms for establishing rebates into the program design, requiring increased utility involvement in applications and offering various services to encourage greater comprehensiveness in measure installations in customer facilities. These options along with many others will be thoroughly evaluated within the context of the goals and objectives of the program for 1993. The end result of these refinement efforts will be the implementation a new C/I retrofit program in 1993 that can be strategically controlled to achieve established annual energy savings without the risk of oversubscription and that will encourage customers to improve the electrical efficiency of their operations over time.

Endnotes

1. Massachusetts Department of Public Utilities D.P.U. Order 89-194 (p. 137-138).

2. Stout, Timothy M.; Matthew E. Sanders 1990, "Penetrating the C/I Retrofit Market: A Comprehensive Approach" in Proceedings of the 1990 ACEEE Summer Study on Energy Efficiency in Buildings, American Council for an Energy-Efficient Economy, Washington, DC.

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