Improving Program Designs for Large Customers: The Importance of Identifying Their Strategic Needs and Wants

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ABSTRACT

This paper describes a recent effort to enhance energy efficiency program designs through identifying and addressing the needs and wants of large nonresidential customers in specific industry sectors. The project had three main objectives: a) identify important strategic issues and market trends; b) identify general and industry-specific drivers; and c) make recommendations that are consistent with broad program approaches and more targeted initiatives.

The central task entailed gathering critical market intelligence, including information about the strategic issues driving specific industries, the needs and wants of large businesses within these sectors, and the implications of those needs and wants for energy-related product and service purchase decisions, energy use, and energy demand. Five California industries were studied: the semiconductor industry, hospitals, aerospace, biotechnology, and food processing. Recommendations for each industry and information on underlying needs and wants were provided to utility planning advisors for developing relevant and feasible utility responses.

The study approach provides new insights into large customer requirements in certain sectors as they relate to the structure and delivery of energy-efficiency programs and promises better targeted and subscribed energy efficiency initiatives. Findings suggest that programs designed around industry-specific needs and drivers are likely to enhance customer responsiveness to energy efficiency recommendations. For example, respondents perceived current ESCO-based programs as often ineffective; programs with fewer M&V requirements and which address process and O&M issues along with equipment issues would be preferred. Most importantly, programs should be industry-specific and should be promoted as enhancing productivity first, energy efficiency second.

Project Overview

Introduction

This paper describes key results from use of a method for enhancing the relevance and effectiveness of energy efficiency (EE) programs targeted to large nonresidential customers in certain industry sectors. This method involves identifying these customers' strategic needs and wants, then designing programs that address these strategic needs and wants, not necessarily the facility-level needs and wants. Southern California Edison

Company conducted a project on behalf of the California investor-owned utilities (IOUs)[1] that was designed to gather information on the needs and wants of large customers as input to the program planning process. The project had three main objectives: a) identify important strategic issues and market trends in selected industries; b) identify both general and industry-specific drivers; and c) make recommendations that lead to the development of broad program approaches and more targeted initiatives. This paper reviews the study method, presents key findings and results, and discusses recommendations stemming from the findings, which are intended to offer insights regarding program design and to improve upon the successes of existing programs.

The project was planned prior to the recent energy problems in California, and so was not designed to specifically address those problems. Most of the workshops with industry experts were conducted at the beginning of the current crisis, so energy issues were on the minds of participants, however circumstances had not reached crisis levels. While the study method may prove relevant in terms of identifying the strategic needs and wants of large customers, it is likely that the impact of the current crisis has changed customers' priorities from what was reported in our interviews. For example, energy reliability and cost of electricity may rank much higher in customers' stated priorities than they would have last year.

Project Design

Historically, most energy-efficiency (EE) programs and program strategies have been broad scale, rather than targeted toward specific industries. Also, these programs have been oriented toward the use of financial incentives and, more recently, toward encouraging the use of ESCO-provided services.[2] Typically, programs for large customers have been marketed to the contacts developed by utility account executives, who are typically the customers' facilities managers or others at that level of the organization. As such, the design and objectives of the programs have primarily addressed the concerns of these facility managers (e.g., reliability, clean power, the availability of rebates for getting efficiency improvements into the planning and budgeting processes) and have often failed to reflect the strategic issues of concern to particular industries. These have achieved successes; however, the typical approach may miss strategic opportunities that can induce customers to cooperate with utilities on issues of intrinsic interest to the industry, not just respond to immediate financial incentives.

The goal of this project was to gather information on the needs and wants of large customers within the context of current market trends and strategic objectives of relevance to their companies, in order to help the California IOUs plan new and more effective EE programs for those businesses. We recognized that to accomplish this, we must redirect program designers' and implementers' current thinking about how programs are developed.

Accordingly, we developed program recommendations that directly address the identified market trends and industry drivers that guide the decision processes of customers

[1] The other California IOUs are Pacific Gas and Electric Company, San Diego Gas and Electric Company, and Southern California Gas Company.

[2] Notably programs in CA, NY, and MA encourage the use of ESCO-provided services. For example, California's Standard Performance Contract (SPC) program, which is designed to encourage the Energy Efficiency Service Providers industry, offers incentives to customers who work with these third-party service providers.

within specific industry segments. To accomplish this, we gathered critical market intelligence, including information about the selected industry segments, the needs and wants of large business customers within these segments, and the implications of those needs and wants for energy-related product and service decisions, energy use and energy demand.

Study Method

First, an extensive literature review was conducted to incorporate lessons learned from previous research. Sources reviewed include market segment analyses, industry reports, and publications from EPRI's "Voice of the Customer" project.[3] (EPRI 1995) Next, the findings of the literature review were used to identify business segments that should be targeted for more detailed research.

Five California industries were identified for study based on energy intensity, energy usage, broader economic importance, and growth. The industries identified were then prioritized on the basis of geographic equity (a balance among industries concentrated in Northern California and those concentrated in Southern California), sector equity (inclusion of both commercial and industrial business segments) and research feasibility (potential for producing useful results to provide input to program planning as quickly as possible). The segments selected for study were the semiconductor industry, hospitals, aerospace, biotechnology, and food processing. Background research was conducted for each segment, to construct a "straw-man" characterization of the industry and to inform the industry expert recruitment process.

Our primary data sources were workshops with experts in each of the selected industry sectors. Each workshop was an intensive one-day session, focused on the needs and wants of the industry, moving from general issues such as the economic climate for the industry, through issues of resource needs and constraints, to specifics of how energy is used as an input and what opportunities for monitoring and control might be available throughout the development and production cycle. A maximum of seven participants were identified and recruited for each workshop from arenas such as professional associations, trade publications, academia, financial services, and consulting. Three of the workshops were held during the summer of 2000 and two more were conducted in the fall. The entire workshop process for each segment spanned two days, since the experts for a segment were invited to attend a "get acquainted" dinner the night before to allow them to interact more informally. The workshop itself then lasted about six hours, with informal discussions taking place during the luncheon. Follow-up contact was made with the participants via email to obtain supplemental data and to solicit their feedback on draft reports.

The workshop findings (e.g., information on industry context, perceived needs, and recommendations made by the industry experts) were combined with the background information and analyzed for their implications for utility support and partnering opportunities. Then the emergent recommendations from the analysis were presented to utility planning advisors for developing relevant and feasible utility responses. For the most part, the program planners and implementers received the findings and recommendations

[3] The Electric Power Research Institute (EPRI) conducted considerable customer needs research in the late 1980s and early 1990s that culminated in the development of CLASSIFY, a needs-based customer segmentation methodology and software, and a four-volume series of CLASSIFY Profiles. See EPRI at www.epri.com.

favorably; however, some did not view their role as being responsible for engaging in the type of outreach requested by workshop participants. Other barriers to this type of outreach and program development relate to the degree to which the study results are applicable only to the selected industries; to the extent that they are, additional research work must be done to identify the strategic needs and wants of other industry segments.

Workshop Findings and Results

The information gathered from the workshops contributed to the market assessment and characterization of each industry segment. These characterizations set the context for the recommendations made by the workshop participants and for the program recommendations that stem from the workshop findings. To illustrate, we next present some of the major findings from the semiconductor and biotechnology industries, with attention to the implications for energy efficiency. A subset of the findings from these workshops is given in Table 1 along with a ranking that reflects their importance as viewed by experts in the relevant industry sector. Although the results are most immediately applicable to these specific industries, we identify findings in the next section that are likely to be relevant for other industry sectors as well.

The most important objective for utilities is to identify the factors driving business decisions within any one industry. These factors relate to how that specific industry makes money, the relevant constraints impacting that process and, ultimately, the implications these factors have for energy use within that industry. The findings from the semiconductor and biotechnology workshops discussed below demonstrate the relevance of gathering this type of market intelligence as input to the program planning process.

The primary factor impacting decisions in the semiconductor industry is their intense need for rapid time-to-market coupled with an extreme emphasis on high levels of quality production. New chips are very high-value products, but the fast pace of innovation often results in limited time available for capturing that value. As a result, the industry values what it perceives to enable or improve productivity – emphasizing quality and speed of production above all else – because the rapid pace of innovation limits the time available for capturing the value of new, high-value chips. This means that, despite their costs, other factors (including energy efficiency) are given lower priority. Although the energy uses involved (HVAC, pumps, processing equipment, and lighting) are not exotic, the narrow tolerances and interconnectedness of the processes involved, create high levels of concern that even modest changes in current configurations (due to energy-savings programs) could erode the quality of products or have adverse effects on the capability to meet quality requirements. Consequently, without industry-specific case studies that document the performance of EE measures in semiconductor production processes, industry decision makers may be reluctant to adopt applicable EE measures.

Another issue stressed by the semiconductor industry workshop participants deals with the industry practice of outsourcing to toolmakers for the tools used to manufacture chips. Toolmakers are given no specifications or incentives for high levels of EE; moreover, they have no motivation to reduce the operating costs of the tools provided to the semiconductor companies. In addition, the participants perceived current ESCO-based programs as ineffective. They felt that the M&V requirements were onerous, and the pro-

Table 1. Summary of Industry-Specific Needs and Wants[4]

Industry Segments	Industry-Specific Needs and Wants									
	Market				Technical				Regulatory	
	Be a low cost provider	Expand Manufacturing Operations	Manage Financial Risks	Re-Establish Market Niche	Obtain Reliable Infrastructure Supply	Avoid Process Interruptions	Enhance Productivity	Enhance Flexibility of Production Facilities	Help Mitigate Regulatory Burdens and Constraints	Seismic Retrofitting Assistance
Semiconductor										
R&D Facilities		Medium			High	High	High	Medium	Medium	
Equipment suppliers (toolmakers)		Medium			High	Medium	Medium			
Biotechnology										
R&D Facilities			High		High	Medium		Medium	Medium	
Production Facilities	Low	High	High		High	High		Medium	Medium	

[4]Note: The results presented here represent the project team's interpretation of the specific comments of workshop participants and material from other sources. The report documenting the complete findings from the study (SCE 2001) can be obtained by contacting Angela Jones at Southern California Edison.

grams were misdirected in that they are equipment-centered and focused on defined retrofit projects rather than offering support for the necessary research into the needs and options of particular facilities. Moreover, they often ignore possibly less expensive and more effective process improvements. These two factors, the practice of outsourcing to toolmakers and the lack of a trusted energy service company support industry, along with the intense need for rapid time-to-market and emphasis on high quality production, seem to impede the development and incorporation of EE measures in this industry.

The biotechnology industry faces similar issues in terms of getting products to market as quickly as possible to capture value; however, their situation is a bit more complicated in that they cannot immediately go to market with newly developed products. Instead, products are first subjected to a complex process of testing and approvals before entering the marketplace. As a result, biotechnology companies are one of the most research-intensive industries, whose R&D facilities are constantly being remodeled to meet changing scientific needs and equipment. Time and effort spent on R&E together with the inability to immediately take products to market makes access to capital and the management of financial risks essential, especially for newer biotech companies. Consequently, these companies rely heavily upon venture capital during the product development stage and are particularly concerned with cultivating their relationships with big pharmaceutical companies, the main funding source of this venture capital.

As the biotech industry matures, however, more companies will be manufacturing products that pass clinical trials, creating the possibility of a manufacturing capacity bottleneck. Mechanical and equipment cost elements are the two most significant cost drivers in building biotech manufacturing facilities, due to the expensive infrastructure requirements such as special electrical, exhaust, emergency power and heating, and HVAC systems.

These main industry characteristics also have important energy implications. While biotech industry facilities engineers are keenly aware of energy concerns, getting products to market outranks energy efficiency in facility management, according to workshop participants. This makes biotech companies prime candidates for successful ESCO marketing efforts. The biotechnology workshop participants also expressed a strong interest in forming collaborative relationships between the utilities and industry organizations. They expressed a particular interest in establishing an ongoing forum for dialogue to obtain information on items of interest such as best practices for conservation and working with utilities to develop financial mechanisms to hedge against energy price uncertainties.

The presentation of the findings from the semiconductor and biotechnology workshops primarily focuses on new or growth industries, but not all industries are in this position. The more mature industries, such as the fruit and vegetable processing and hospital industries, share similar concerns, but these industries spend more time thinking about conserving capital through O&M improvements that reduce costs. This means that in a supply constrained energy market with high prices, these industries will also be interested in obtaining help from the utilities with managing financial risks. However, these companies may be more receptive to EE measures that result in cost reductions or to participating in load management programs that take into consideration their process constraints. For example, fruit and vegetable processors, who are well versed in financial risk management due to the seasonal nature of their business, expressed a desire to work with utilities to obtain a better understanding of how market mechanics work and gain strategies for shifting risk to mitigate the impact of increased electricity costs. Likewise, hospital industry workshop

participants were interested in investigating the feasibility of using hospital back-up generation facilities to both assist the state during tight electricity supply conditions and profit from sales to the grid.

Recommendations

The analysis of the market intelligence data gathered in the workshops, the literature review and background research, and the discussions with utility planners reveal a set of strategic needs and wants that have important implications for energy efficiency. Additionally, they offer valuable guidance for the development of future energy efficiency programs for large customers. Energy efficiency programs in the past have assumed that customers are motivated to participate because their goal is EE. However, future EE programs should be designed around the industry-specific needs and drivers identified, in order to enhance customer responsiveness to EE program offerings.

Given the identified strategic needs and wants in each industry segment, we found three overarching themes that encompass most of the proposed recommendations for enhancing EE programs targeted at large nonresidential customers:

1. Build industry-specific partnerships and/or cooperative relationships between the utilities and their large customers.
2. Modify existing programs that are intended to increase EE and reliability, such as the California SPC program and Southern California Edison's Emerging Technologies Program, by aligning program designs and utility strategies with industry goals.
3. Provide educational assistance to large customers in this era of competitive transition within the utility industry.

Across the board, participants expressed a desire to create/build partnerships with the utilities in working toward common goals relating to energy use and demand. In fact, as found in other recent research (cf. Morgan 2000) industry representatives suggest that what they want are strategic partners rather than "suppliers." However, it is very important to industry representatives that the partners in a utility/business EE consortium understand each other's businesses. The utilities are seen as experts on energy-related issues, but are faulted for a lack of long-term commitment to working with industries and for pushing standard, "one size fits all" efforts to encourage energy savings.

Workshop participants indicate that there is a desire for strategic guidance provided at the executive level, along with more fundamental partnerships between the utility and industry. Utilities could leverage the existing relationships of certain industry coalitions to develop solutions and assist with program design and implementation of energy efficiency measures, load management, and other forms of collaboration. For example, the utilities could explore ways to partner with SEMATECH, a consortium of thirteen semiconductor companies, to demonstrate the value and feasibility of EE measures in the semiconductor industry. Tactical guidance on specific energy efficiency opportunities should continue to be provided primarily by utility account executives. In addition, relationships with certain types of expert consultants (e.g., fabrication facility designers for the semiconductor industry) could help tailor offerings and increase credibility when working with these industries. In this respect, these expert consultants may even be a resource or contact for the delivery of programs and initiatives.

Programs should be promoted, foremost, as enhancing productivity, with one of the means for increasing productivity being energy efficiency. In fact, EE programs based on industry-specific market intelligence may give customers new levers with which to respond to their companies' strategic needs. Along these lines, experts in all the sectors under consideration viewed industry-specific demonstrations and case studies as important. They particularly valued information that proves the relevance and effectiveness of EE measures based on experience with that specific industry. They do not regard assertions about the transferability of EE benefits that are derived from experiences with other industries as valuable.

We believe that some existing utility demonstration programs are well suited for this role and, with the assistance of expert industry consultants, could possibly be tailored to address specific industry needs For example, Southern California Edison's Emerging Technologies Program designs demonstration projects at customer facilities and publishes case studies on the use of common technologies in new applications. These programs could be tailored to address the specific needs of the semiconductor industry by working with industry consultants to demonstrate the feasibility of using high efficiency HVAC systems in clean rooms.

Further, our panelists perceive current public-purpose programs that encourage the involvement of ESCOs as often ineffective. Participants reported that these programs have onerous administrative and M&V requirements. They view them as misdirected, too often focusing on HVAC and other such equipment issues at the expense of the process and O&M issues that are more relevant to industry concerns. For example, when working with food processors, the unique challenges offered by seasonal loads must be addressed. Workshop participants viewed California's standard performance contract as a cookie cutter approach that does not meet the needs of seasonal processors.

Our final recommendation is to provide educational assistance to large customers. One option is to educate facility managers in each of the studied industries in making the business case for energy saving and load management activities. These managers are engineers, maintenance personnel, and technicians, whose skills are directly related to the operation and maintenance of the facility. Their focus is usually not on the company strategy and goals, or the calculation of financial risks. However, to succeed in making a business case for EE activities requires that they show the value of those investments in the context of the more global strategic needs of the company. Although facility managers may be more attuned to the operational benefits of EE measures, without these basic business skills, they are less likely to be successful in making a case to upper management and thus less able or successful in supporting utility program participation and objectives.

Another way of educating large customers is to explain what is currently going on in California's electricity market. Participants in some workshops requested that the utilities provide them with clear, concise, accurate information about the future of California's electricity market. At the very least, the utilities can help them understand the options that are on the table and how to sort through those options. There was even a suggestion that utility advice and assistance with managing the financial risks associated with energy price volatility would be extremely valuable.

Conclusions

The typical approach to EE and program design tends to result in the "same old, same old" addressed to facility managers and focusing on their more immediate problems such as reliability, clean power, and the need for financial incentives to capture the attention of senior management. In contrast, this research identified and leveraged information from market actors and decision influencers who bring intimate but broader views of their industries' strategic needs.

This approach provides new insights into large customer requirements as they relate to the structure and delivery of EE programs. Accordingly, it promises better targeted and subscribed EE initiatives. Our recommendations derive directly from the analysis of five specific sectors, but some generalization to other industries seems appropriate. However, specific applications to different sectors will require more detailed looks at those industries. Most important, we believe that programs designed around the industry-specific needs and drivers identified are likely to improve customer responsiveness to EE opportunities. Perhaps more importantly, the utility program planners and implementers should consider engaging in a new and different level of customer outreach. This approach emphasizes cooperation and partnerships, and could lead to programs that better attend to the needs and wants of large nonresidential customers in different industry sectors.

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