ADAPTING THE MARKET TRANSFORMATION APPROACH TO EXPAND THE REACH OF PRIVATE ENERGY EFFICIENCY PROVIDERS

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ABSTRACT

Energy Service Companies (ESCo's) and other energy efficiency service providers have made substantial progress over the past two decades and now amount to a multi-billion per year industry. However, relative to the potential for energy-saving investments, the industry is small. As the electric utility industry restructures, many states are establishing public benefit charges to fund energy efficiency and other public benefit programs. In some states, a portion of public benefit funds are being used for Standard Performance Contract (SPC) programs, with the objective that these expenditures will make for a stronger energy efficiency services industry in the long term.

In these states, as well as some other states, public benefit funds are also being used to fund market transformation programs that seek to identify and address barriers impeding the market development of specific energy-saving technologies and practices, with the long-term goal of making efficient goods and services normal practice in appropriate applications and sustaining these changes over time. At least two states (California and New York) are now seeking to combine these strategies by applying the market transformation approach to the development of the energy efficiency services industry. Such an approach involves identifying: market segments to target where intervention is needed and the likelihood of success; barriers that inhibit the development of the energy efficiency services market in these segments; and strategies that address, and hopefully overcome, these barriers.

This report explores these segments, barriers, and strategies in a preliminary manner. These explorations suggest that a market transformation strategy to promote the energy efficiency services industry can build upon straight SPC programs (whose primary goal is acquisition of energy savings) but should modify these programs in two fundamental respects. First, with a market transformation orientation, rather than target SPC resources broadly to all potential customers and measures, SPC resources should be targeted more carefully to: specific measures (e.g., higher incentives for non-lighting measures than lighting measures); sectors (e.g., emphasis on promising emerging energy services markets such as industrial, mid-size commercial, and large commercial that is not owner occupied); customers (e.g., establishing tight incentive per customer caps to spread incentives among many customers, thereby exposing more customers to the benefits of working with energy efficiency service providers); and service providers (e.g., giving some preference to service providers with a local presence and who

provide some evidence that the they have a long-term commitment to providing services locally).

Second, rather than put all resources into SPC's, some resources should be saved for complementary efforts such as:development of case studies and other education efforts; evaluating, improving, and publicizing existing accreditation programs; developing improved tools such as simpler contracts, simpler/improved M&V procedures, and new innovative financing approaches; adopting reforms to federal procurement practices for energy services; and offering training programs for potential service-provider staff.

INTRODUCTION

Efforts to further the more efficient use of electricity are experiencing a period of flux, which is driven to a large extent by the restructuring of the electric utility industry. As states restructure their electric sectors, they generally are seeking ways to continue to foster energy efficiency, primarily by establishing small public benefit charges (PBC's) to fund energy efficiency and other public benefit programs (e.g., programs to serve low-income households, support public benefit research and development, and promote renewable energy sources) (Kushler 1998a). In establishing such programs, states are frequently seeking to encourage the market to promote energy efficiency investments, in the same spirit that restructuring overall is supposed to unleash market forces. PBC's are generally modest in size, and since resources are limited, there is a premium on spending the available funds efficiently. Furthermore, in some states, there is a professed desire to fund PBC's only for a transition period with the hope that after the transition period the market will take over and broadly promote efficiency investments. In this policy context, two major concepts are commonly espoused—developing the private energy efficiency services market and market transformation.

The Energy Efficiency Services Industry

The private energy efficiency services market is already extensive, made up of such players as energy service companies (ESCo's), property service companies, engineering and architectural firms, consultants, and electrical, mechanical, and other contractors and vendors. Furthermore, each of these categories captures a diverse range of firms. For example, the ESCo category includes traditional performance contracting firms as well as firms that combine power marketing or brokering and other services with energy efficiency services (these latter firms have sometimes been labeled *retail* energy service companies (RESCo's) or *super-ESCo's* (Dayton, Goldman, and Pickle 1998; Vine, Nakagami, and Murakoshi 1998).

The private energy efficiency services industry is very large. While solid figures are not available, Dayton estimates that performance contracting revenues now total $3-5 billion per year, energy efficiency services more broadly is a $6-12 billion per year industry, and total sales of efficient equipment and services (where *efficient* is defined to mean at least 10 percent more efficient than typical equipment sold in 1985) is on the order of $100 billion per year (Dayton 1998). Frost and Sullivan estimate that all equipment and services related to energy end-uses is a $200 billion industry, including nearly $2 billion per year for energy efficiency services sold on a performance contracting basis (Frost and Sullivan 1997). Looking more specifically at just ESCo projects, Cudahy (1995) estimates that annual investments have grown from approximately $30 million in 1980 to $455 million in 1994 (both in 1994$), an average annual growth rate of 21 percent over the 14 year period (unfortunately more recent data are not available).

The private energy efficiency services industry is also going through a period of great change. For example, in addition to the development of RESCo's and super-ESCo's as discussed above, there are also trends towards increasingly large firms, often owned by utilities and power marketers, and a trend away from traditional performance contracting (payments based on demonstrated energy savings) towards a more diverse array of financing options such as fee-for-service and leasing (Dayton, Goldman, and Pickle 1998).

The Market Transformation Approach

Market transformation means reducing market barriers to the adoption of cost-effective energy efficiency products and services in a sustained manner. If the most important and relevant market barriers have been addressed to the point where efficient goods and services are normal practice in appropriate applications, and these changes are sustained over time, then a market has been transformed. The market transformation approach thus far has been primarily applied to efficient technologies (e.g., high-efficiency refrigerators) and services (e.g., commissioning of new commercial buildings). At the national and regional levels several dozen market transformation initiatives are now being implemented (Nadel and Latham 1998).

In general terms, a market transformation initiative or strategy generally involves: (1) a careful analysis of the overall market, including an identification of the particular barriers that are hindering the development, introduction, purchase, and use of the targeted measure; (2) a clear statement of the overall goal of the initiative or strategy as well as the specific objectives that will be accomplished along the way by the different initiatives or activities; (3) the development of a set of coordinated activities that will achieve the desired objectives and systematically address each of the identified barriers; (4) implementation of the individual activities, including periodic evaluations and adjustments designed to respond to actual experience; and (5) development and execution of a plan for transitioning from extensive market intervention activities toward a largely self-sustaining market, i.e., an "exit strategy" (Nadel and Latham 1998).

While the market transformation approach is primarily being applied to energy-saving technologies and practices, at least two states—California and New York—are also trying to apply the market transformation approach to development of the energy efficiency services industry. For example, in describing its strategy for efficiency programs during the transition to a restructured electricity industry, the California Public Utility Commission discussed a two-pronged strategy, one of which is "to promote a vibrant energy efficiency services industry that can stand on its own" (Eto et al. 1997).

Contents of this Report

This report builds upon the lead being taken by California and New York and discusses how the market transformation approach can be applied to the development of the private energy

efficiency services industry. The report tends to emphasize the role of ESCo's (defined broadly), since they have been the most involved in state PBC debates, but we also try to keep in mind the interests and needs of other energy efficiency service providers. The report is based on a review of recent reports on the market for energy efficiency services, on a series of interviews with ESCo's and other energy efficiency market observers, and on the author's own experiences.

Please note that while the focus here is on market transformation, market transformation is not the only possible objective for energy efficiency programs (Eto, Goldman, and Nadel 1998). For example, a traditional objective of demand-side management programs has been resource acquisition. In states with extensive PBC budgets, some resource acquisition is still going on. And in these and other states, efficiency resources may also be acquired in order to defer the need for distribution system upgrades. In these states, additional work with the energy efficiency services industry may well be justified, without the more careful targeting as espoused in this report. In addition, there are many ways that the energy efficiency services industry can participate in traditional market transformation initiatives. These are beyond the scope of this report but others (Cowell and Hewitt 1998) have begun exploration of these issues.

PAST AND CURRENT ACTIVITIES TO FOSTER THE ENERGY EFFICIENCY SERVICES INDUSTRY

Utilities, federal and state governments, and (most importantly) the energy efficiency services industry itself have been working to foster the industry for nearly 20 years. An entire book could be written on these past programs, which is well beyond the scope of this report. Instead, we briefly summarize some of these efforts, with an emphasis on accomplishments and lessons learned. We divide our brief survey into five sections: the 1980s, bidding, standard performance contracts, restructuring and other efforts.

The 1980s

In the 1980s the performance contracting concept received extensive attention and several utilities began offering programs to provide incentives for ESCo's (and sometimes other service providers). Under these programs, the ESCo's attracted potential customers through marketing, identified the measures to be installed, financed and installed the measures, and sometimes assisted in measure maintenance. Typically the ESCO's received payments from the utility for each kilowatt (kW) or kilowatt-hour (kWh) saved and/or they received payments from the customer based on a share of the value of the savings achieved. Left to their own devices, most ESCo's chose to concentrate on the largest commercial and industrial C(&I) customers (those with peak demand of more than 500 kW) and the most lucrative energy-saving measures (particularly lighting and cogeneration) (Nadel 1990).

In the commercial and industrial sectors, limited side-by-side comparisons indicated that other program approaches could achieve greater participation than ESCo-based programs (Hicks

1989). In the residential sector, the best performance contracting programs achieved very good participation rates—40 percent or more. Both residential and commercial/industrial performance contracting programs tended to be more expensive per kWh saved than many other program approaches (Nadel 1990; Nadel, Pye and Jordan 1994). On the other hand, to the extent ESCo's assisted with measure maintenance or guaranteed persistence of savings, extra value was created for the utility and the customer. Also, ESCO programs were useful for customers who lacked financial resources and technical skills to implement energy efficiency improvements on their own. Due to the limited participation and relatively high cost of performance contracting programs, by the early 1990s most utilities that offered performance contracting programs either phased-out these programs or chose to complement them with other types of programs.

Bidding

Bidding programs began in 1987 with Central Maine Power's Power Partners program. The purpose of bidding programs is to let the market determine the price of new resources and the proper mix of program efforts, including the mix between demand- and supply-side resources and/or the mix of utility-sponsored programs relative to the efforts of non-utility parties. In bidding programs, utilities or other program administrators request proposals from outside parties to supply demand-side and/or supply-side resources. Successful bidders are selected on the basis of price and other factors. In some bidding programs, bids are limited to specific sectors (e.g., C&I) or end-uses (e.g., lighting); in other programs, bids for any sector or end-use can be submitted. Many bidding programs are essentially a form of performance contracting; however not all bids are awarded on a performance contract basis.

Goldman and Kito (1994) examined 18 bidding programs and found that bids were primarily for large C&I projects—residential and small C&I bids were limited. The vast majority of demand-side bids (87 percent) were submitted by ESCo's. Most bidding programs received bids for far more capacity than they needed, allowing utilities to be very selective and only choose the best bids. Most bidding programs emphasized lighting measures; even programs that encourage comprehensive packages of measures found that lighting measures accounted for 70-100 percent of savings. Overall, as of October, 1993, utilities contracted for approximately 425 megawatts (MW) of demand-side resources through bidding programs, which accounted for less than 5 percent of DSM savings during the early 1990s.

Bidding programs, by definition, cost less than utility avoided costs (because bid prices are capped at avoided costs), although there is a tendency for bids to approach utility avoided costs. For example, Goldman and Kito (1994) found total resource costs (i.e., including measure costs as well as costs of program delivery) of $0.054-0.08 per kWh saved (assuming an 11 percent nominal discount rate), which was more than most other types of DSM programs. However, as with performance contracting programs, ESCo payment in part is dependent on savings over time, and thus savings with bidding programs should be more persistent than with program approaches that lack good measure monitoring and maintenance mechanisms.

From the perspective of ESCo's we interviewed, bidding programs were often lucrative but complicated. Preparing proposals was a lot of work, benefit-cost analyses were commonly required for each individual project, and monitoring and verification protocols were complicated. Also, bidding programs generally required ESCo's to submit bids before they recruited customers, which is different from the way they normally conduct business. Thus, while many ESCo's participated in bidding programs, when standard performance contract programs began (as discussed below), most ESCo's found them preferable to bidding (Goldman et al. 1998).

From the utility perspective, due to the high cost of many bidding programs and uncertainty about the future structure of the electric utility industry, issuance of DSM bid requests slowed down in the mid-1990s. However, a few bidding programs have continued and new ones are occasionally started (Dayton, Goldman, and Pickle 1998).

Standard Performance Contracts

Standard performance contracts (SPC's), also called "standard offers," were first developed by Public Service Electric & Gas (a New Jersey utility) in 1992. Under the standard performance contract, the utility or other program sponsor agrees to make payments for demonstrated energy savings, typically on a $/kWh basis. Payments are made over a few years based on monitored energy savings. SPC's differ from bidding in that both payments and monitoring and verification protocols are standardized, which makes them easier to administer and participate in than more complex programs such as bidding. To date, SPC's have been operated in New Jersey and California; in addition, a program is just beginning in New York and programs are being planned in Texas and Wisconsin.

In New Jersey, two programs were run—Standard Offer 1 (SO1) from May 1993 to mid-1996 and Standard Offer 2 (SO2), which began in mid-1996 and is still on-going as of this writing. The programs differed primarily in their payment levels. In SO1, payments were based on then-current avoided costs and proved to be generous for lighting projects. In SO2, payments declined an average of 27 percent relative to SO1 for the first block of savings (50 MW) and an additional 7 percent for the next block of savings.

An evaluation of both programs was completed in October 1998 (Edgar, Kushler, and Schultz 1998). This evaluation found that the two programs have reduced peak demand by 200 MW, of which 82 percent were in large C&I facilities, 15 percent in small C&I facilities, and 3 percent in the residential sector. Of the C&I savings, 29 percent were in public and institutional buildings, 34 percent in other commercial buildings, and 37 percent in industrial facilities. In the industrial sector, savings were primarily from facility changes and not process changes. Of the energy (kWh) saved, 60 percent was from lighting measures, 27 percent from fuel switching, and 13 percent from HVAC, motors, and industrial process measures. Nearly all of the work in small C&I facilities was in SO1; during SO2 payments were too low to motivate most ESCo's to pursue the small C&I market. Only two vendors pursued the residential market

and achieved limited energy savings. Lighting savings dominated the program in part because these provided large amounts of cost-effective savings and in part because measurement and verification (M&V) procedures needed to be approved by the utility for all non-lighting measures, which proved to be a cumbersome process and resulted in the many non-lighting projects not going forward. Many of the ESCo's and customers interviewed as part of the evaluation criticized administration of the SO2 program (in comparison to satisfaction with SO1), saying that administrative decisions were slow in coming and in general staff did not go "the extra mile" to make the program work.

Based on their research, the authors of this evaluation credit the SO programs with helping to establish the ESCo industry in New Jersey. However, they note that if SO type subsidies were to end now, the industry is likely to be limited to certain niche markets. They conclude that a SPC program should be continued for the large C&I markets, but that for other markets, other program approaches are needed. They recommend steps to improve program administration and better standardize and streamline M&V requirements, particularly for non-lighting measures. As part of M&V streamlining, they make the case that verification procedures can be relaxed, such as by shortening monitoring periods from 10-15 years to 3-5 years (Edgar, Kushler, and Schultz 1998; Kushler 1998b).

The California 1998 program built on the New Jersey experience and took steps to address some of the biggest problems that arose in New Jersey. For example, the California program included standardized M&V protocols for more measures than New Jersey, had streamlined procedures to review M&V proposals, and also allowed more flexibility on M&V approaches. California offered separate programs for the residential and non-residential sectors in order to ensure that the residential sector was served. In the non-residential program, California offered lower incentives for lighting ($0.075/kWh saved) than other measures ($0.21/kWh for HVAC and refrigeration, $0.11/kWh for other non-lighting measures) in an effort to promote greater diversity in the types of projects implemented. In the residential program, incentives also varied, from $0.11-0.48/kWh saved, with payments primarily varying by measure life and secondarily by type of home (incentives were sometimes higher for multi-family and mobile homes than for single-family homes) (Goldman et al. 1998; Rubenstein, Schiller, and Jump 1998).

The California program began in early 1998. Within four months, nearly the entire year's budget was committed, indicating that the program was very attractive to ESCo's and other eligible participants (primarily individual customers who proposed energy-saving improvements to their facilities) (Goldman et al. 1998). The California non-residential program was successful in moving beyond lighting projects—preliminary data indicate that nearly half of savings from approved projects were for HVAC measures, just under 40 percent for lighting measures, and a little over 10 percent for other measures . As with the New Jersey program, the California non-residential program primarily served the institutional and commercial sectors—preliminary data indicate that 34 percent of incentives went to government and educational facilities, 20 percent

to grocery stores, 27 percent to other commercial buildings, and only 19 percent to the industrial sector including refrigerated warehouses. Preliminary findings also indicate that participating customers are predominantly large, multi-site organizations (average electric bill more than $1 million annually) and that five ESCo's (including one engineering firm) accounted for 60 percent of ESCo incentives (XENERGY, Inc. 1998).

The California residential SPC program was also very popular among contractors, with many more proposals received than funds allowed. Ultimately, a lottery was held to select contractors to participate in the program, a step that has been widely criticized as it provided no room to give preference to high-quality proposals. Given the high incentives offered for multifamily and mobile homes, as well as simple "deemed savings" for specific measures, most of the proposals involved installation of one or a few short-life measures in many apartments, at no cost to the owner or tenant. Many of the proposals came from out-of-state firms. A recent review of this program concluded that it was a essentially an acquisition program that is "not likely to realize longer-term savings, establish long-term customer relationships, nor influence customers to purchase energy-efficiency equipment once the programs cease to exist" (Rubenstein, Schiller, and Jump 1998).

For 1999, California is significantly revising its SPC program. Guidelines developed by the California Board for Energy Efficiency (CBEE—a body established by the California legislature to advise the California Public Utility Commission on energy efficiency issues) call for lower non-residential incentives in 1999 ($0.05/kWh for lighting savings, $0.165/kWh for HVAC and refrigeration, and $0.08 for other measures) and setting aside at least 15 percent of the funds for small C&I projects (with incentives approximately 10 percent higher for small C&I customers). In the residential area, the focus in 1999 will be on multi-measure retrofits of homes using locally based contractors, and not the single-measure efforts using out-of-state firms that predominated in 1998 (CBEE 1998).

Restructuring

Many observers of electric utility industry restructuring have suggested that restructuring will provide a substantial boost of the energy efficiency services industry because there will be substantial opportunities to augment power sale contracts with value-added energy efficiency services.

Restructuring is still young and it is too early to evaluate whether restructuring will benefit the energy efficiency services industry. Early indications thus far are mixed. On the one hand, there have been several well-publicized examples of firms contracting to procure both power and energy efficiency from the same source, such as Microsoft's contract with Johnson Controls, Dreamworks Studio's contract with Energy Pacific, and Ultramar Diamond Shamrock's agreement with PG&E Energy Services (Dayton, Goldman, and Pickle 1998). Similarly, some customers are choosing to outsource their energy services, including on-site

power generation, back-up power, and energy efficiency. An example of this type of arrangement is Scott Paper's contract with the Southern Company (Elliott, Pye, and Nadel 1996). One of the ESCo's interviewed as part of the research for this present report indicated that they are having some success arranging buying groups in which the ESCo represents the group, buys power on the group's behalf, and also provides energy efficiency services. According to this ESCo, the lure of discount power is the initial selling point but over time group participants come to realize that savings from energy efficiency can provide greater benefits than discount power.

On the other hand, some observers think that selling long-term power and efficiency contracts may be a difficult sell, particularly since many customers want short-term power contracts and are not willing to commit to the longer terms needed to justify third-party energy-saving investments (Dayton, Goldman, and Pickle 1998). Support for this view is provided by experience in other countries following restructuring—while power sales agreements are common, rarely have efficiency services played a significant role (Eto, Goldman, and Nadel 1998). Only time will tell which of these factors proves predominant and thus whether restructuring proves to be a "big bang" or "minor pop" for the energy efficiency services industry.

Other Efforts

In addition to the major, largely utility-driven programs discussed above, there have been a variety of other efforts to help support the private energy efficiency services industry. These efforts range in scope and importance and include the development of the International Performance Measurement and Verification Protocol, reform of state and federal regulations to make it easier for government-owned facilities to participate in performance contracting projects, formation of an ESCo trade association, and the U.S. Department of Energy's (DOE) Energy Fitness program. These efforts are briefly reviewed in the paragraphs below.

The International Performance Measurement and Verification Protocols were developed by DOE in order to provide a standardized and well-accepted approach for determining the savings from energy-saving projects. The protocols were designed to replace the patchwork of inconsistent approaches used previously and increase customer and lender confidence in retrofit performance, thereby facilitating project acceptance and lowering the cost of financing. The Protocols were developed by several committees comprised of about a dozen technical and industry experts and are now being widely distributed and used (Kats et al. 1996). Refinements to the Protocols continue to be developed; for example, the California SPC program has been actively engaged in this work.

In many states and at the federal level, procurement regulations make it very difficult for governments to sign performance contracting agreements. To address this problem, both the federal government and more than 35 states have adopted specific legislation authorizing state

and local government agencies to enter into performance contracting agreements. In addition, several states as well as the federal government have developed specific programs to help agencies work with ESCo's. For example, the Federal Energy Management Program (FEMP) includes a major focus on working with ESCo's. Among other steps, FEMP has developed regional "short lists" of experienced performance contracting firms who are prequalified to work at individual federal facilities. The federal General Services Administration has developed "area-wide contracts" that allow federal customers to contract with local utilities to develop, manage, and implement energy efficiency projects. In some cases, these efforts have been very successful—for example, Florida now has 7-9 ESCo's active in serving schools throughout the state (Dayton, Goldman, and Pickle 1998). Maryland, Michigan, and Ohio also have successful programs (Brown et al. 1996). In other cases, these efforts have provided more promise than action thus far. For example, only a limited number of projects are moving forward under the FEMP program due to a myriad of problems (Cudahy and Dreessen 1996; Dayton, Goldman, and Pickle 1998).

The National Association of Energy Service Companies (NAESCo) is an ESCo trade association that now has more than 30 full members (e.g., ESCo's and lighting service companies) as well as many associate members. NAESCo seeks to promote the interests of the ESCo industry but also to address problems facing the industry. NAESCo works to document and promote the accomplishments of the ESCo industry and to lobby on behalf of the industry for programs and policies of benefit to the industry. NAESCo also operates an accreditation program that provides recognition to service providers that agree to NAESCo's ethical guidelines and that are judged by independent examiners to meet certain technical and financial requirements. NAESCo promotes accredited ESCo's as providers of quality services (NAESCo 1997).

The Energy Fitness program is a small DOE program that actively works with NAESCo and other partners. It is designed to help address barriers facing the energy efficiency services industry and to foster the development of the ESCo industry. Among its activities, Energy Fitness has developed a customer handbook to guide procurement of ESCo services, a set of case studies on successful projects, and model state ESCo enabling legislation. Energy Fitness has also assisted in the development of the NAESCo accreditation program (DOE 1998). Energy Fitness has made significant progress developing materials that ESCo's and others can use but the program has been hampered by lack of a solid home within DOE (it has been located in three different programs over the past several years) and limited funding.

Discussion

The energy efficiency services industry has made a lot of progress in recent years. As noted previously, while figures on the entire industry are not available, just the ESCo portion alone has grown by 21 percent over the 1980-1994 period. Much of this growth is probably due to the entrepreneurial efforts of these firms—they have been creative marketers and financiers,

and firms that are around today have learned from past mistakes. However, the many programs discussed above have also contributed to the development of the energy efficiency service industry, providing incentives that help them raise capital and sell projects and also providing independent recognition that they have useful services to sell.

The energy efficiency services industry has primarily prospered in the institutional sector and secondarily the large commercial sector. Success has been much more limited in the industrial and residential sectors and among small- and medium-sized commercial customers. For example, data collected by Cudahy (1995) found that over the 1990-1994 period, 60 percent of ESCo investments were in the institutional sector, 32 percent in the commercial sector, 7 percent in the industrial sector, and only 1 percent in other sectors including residential. Of current activity, a significant (but minority) portion is dependent in part on incentives from SPC and other programs, making it unclear what would happen to some firms if the incentives were to end. Furthermore, intervention efforts tend to emphasize financial incentives but not all barriers confronting the energy efficiency services industry can be addressed with incentives, just like traditional utility rebates do not address all barriers facing sales of more efficient lighting, motors, and HVAC equipment. And of the funds that are available to help support the energy efficiency services industry, a significant portion is going to acquire energy savings or to sectors where subsidies may not be needed. With better targeting, it is likely that the long-term benefits to the energy efficiency services industry could be increased.

The market transformation approach provides a way to structure discussions on how best to assist the energy efficiency services industry so that it can prosper in the long term. In the following sections we begin these discussions. Such discussions do not entail abandoning current approaches such as SPC's—these approaches are likely to play a significant role in a market transformation strategy. But by looking at the needs of the energy efficiency services industry and their potential customers in a systematic way, we can better target current efforts as well as identify complementary efforts that when operated in conjunction with current efforts can increase the chances of long-term success.

UNDERSTANDING THE MARKET AND MARKET BARRIERS

The first step in developing a market transformation initiative is to understand the current market for a product or service. What are the different market segments and niches? How developed is the market? What are the current strengths of service providers? What barriers do they face? Some of these issues were briefly discussed earlier in this report; they are discussed in more detail elsewhere (Cudahy and Dreessen 1996; Dayton, Goldman, and Pickle 1998). Still, improved understanding of the current market is a useful foundation for developing a market transformation initiative. As a start in this direction, the Energy Center of Wisconsin and the New York State Energy Research and Development Authority have just completed an in-depth study to characterize the energy efficiency services market in Wisconsin and New York (Feldman and Easton Consultants 1999). In California, similar information is being collected as

part of the evaluation of the 1998 SPC program (Goldman et al. 1998). Similar studies may be useful in other regions of the country.

Understanding market barriers and developing strategies for overcoming these barriers are the heart of the market transformation approach. In the case of the market for energy efficiency services, barriers are many-fold and include generic barriers that apply to most sectors as well as barriers that apply to only one or several market segments. Based on our research and interviews, barriers facing energy efficiency services in general and performance contracting in particular include both demand-side (customer) and supply-side (service provider) barriers. A preliminary list of these barriers is as follows:

Demand-Side Barriers:

1. Customers lack awareness of efficiency service providers and the ways they operate (applies primarily to medium- and small-sized customers).

2. Customer are skeptical about efficiency service providers, driven in part by bad experiences with less-than-competent firms, particularly in the past (again, this barrier applies primarily to medium and small customers).

3. Many potential customers (primarily medium and small customers) confused by contracting and performance verification.

4. For most customers, energy is a low priority, lacks internal advocate, and is treated as a commodity.

5. Customers do not want to disrupt on-going operations and are reluctant to have outside firms "muck around" in their facilities (this barrier applies particularly to the industrial sector).

6. Customers have complicated decision-making chain of command, which makes reaching agreement with energy service providers difficult.

7. Customers often reluctant to try something new, i.e., new technologies or financing approaches (financial staff tend to be particularly reluctant).

Supply-Side Demands:

1. Most of the limited (albeit growing) number of capable firms operate at the national level and may not concentrate in specific local areas.

2. There is a shortage of experienced staff that service providers can hire.

3. High transaction costs exist for developing complex, long-term projects (which in particular makes it hard to earn a profit on small- and medium-sized projects).

There are also a variety of additional barriers that impede the use of energy efficiency service providers in specific market sectors. For example, in the institutional sector, additional barriers include complex procurement rules that hinder use of performance contracts in the public sector and a particularly pronounced reluctance by many government managers to try new approaches. In the commercial sector, a particularly large barrier is the "split incentive" problem in rental buildings—energy costs are often passed along to tenants, providing little incentive for owners to improve energy efficiency. In the industrial sector, there are several prominent barriers, including the complexity and sensitivity of industrial processes, the fact that most ESCo's are not as familiar with industry as they are with other sectors, and the aversion of industrial customers to long-term contacts (as one ESCo stated, in the industrial sector, five year performance contracting terms are good, seven years a stretch, and the traditional ten year contract unworkable). In the small C&I and residential sectors, high transaction costs per project are a key hurdle, making it difficult to earn profits and reducing investor interest in these sectors. Also, smaller firms are generally more reluctant to enter into long-term contracts than large firms.

IDENTIFYING MARKET SEGMENTS TO TARGET

Market transformation initiatives generally do not target broad markets all at once but instead seek to identify initial niches to target that have significant needs but also good chances for success. Over time, as successes are achieved in some niches, the focus can broaden to include additional niches. In an effort to identify market niches to target for initiatives to expand the energy efficiency services market, we asked service providers and industry observers to discuss different market niches—asking them to identify which they think are currently strong, which are promising, and which are long shots. In general, there was a lot of agreement among survey respondents as to the relative strength of different markets, although some disagreements as to the long-term prognosis for some market segments (for example, most respondents considered the residential sector a long shot but some thought that eventually ways would be found to tap into this market). Overall, our respondents categorized the different market niches as follows:

Currently Strong: MUSH (Municipalities, Universities, Schools and Hospitals), public housing

Growing: large owner-occupied commercial, chains

Promising: mid-size commercial, federal facilities, industrial, commercial real estate, retail, supermarkets, museums, concert halls, YMCA's

Challenging: small commercial, high-use single-family residential

Most Challenging: other residential

While these findings apply broadly to the United States as a whole, there are also significant regional variations. For example, our respondents noted that the market for energy services is strongest in the Northeast and California, where energy prices are high and there is a long history of energy efficiency programs. According to our respondents, the Mid-Atlantic, Midwest, and Texas markets are starting to open up while in the Southeast there is little activity outside of the "MUSH" market.

While these findings are based on a small sample and thus should be viewed as preliminary, they imply that in order to have the most long-term impact, future promotion efforts should perhaps target the sectors listed above as "promising" and "growing" (i.e, the industrial sector and substantial portions of the commercial sector). The MUSH and large owner-occupied commercial markets are likely to proceed without significant intervention, while to reach the small C&I and residential sectors will likely require other approaches (one option is mentioned later in this report).

DEVELOPING INTERVENTIONS TO OVERCOME BARRIERS

Once barriers are identified, the market transformation approach seeks to identify steps that can be taken to reduce these barriers so that in the long term they no longer impede market development. In most cases, multiple strategies are needed to overcome each barrier and strategies can change over time as initial barriers are reduced, allowing more attention to paid to other barriers. In developing strategies to overcome barriers, traditional program approaches often play a role but frequently creative new approaches are needed as well. The market transformation approach generally involves thinking strategically about how to overcome each barrier and rarely assumes that just throwing money at a problem will make the barrier go away on a sustained basis. To illustrate possible strategies for overcoming the barriers to private energy efficiency services, Table 1 summarizes some of the generic barriers that are faced in many markets (as discussed above) and possible strategies for addressing these barriers. Some barriers, such as contracting and verification issues, are relatively straightforward to address. Other barriers will be difficult to overcome and will likely require long-term efforts (for example, the low priority many customers place on energy issues and complicated customer decision-making procedures).

The interventions summarized in Table 1 and discussed below are all preliminary ideas. For each idea, further review and discussion is needed, particularly discussions with efficiency service providers and their potential customers. The ideas presented here are intended to illustrate the market transformation approach and are not intended as a definitive blueprint.

In Table 1, a number of interventions were mentioned, some several times. Among the major interventions are:

1. Educating potential customers (including financial decision-makers) on the benefits of efficiency services and how they work, including preparing case studies of successful projects and company-wide programs;

2. Undertaking steps to address customer skepticism, including publicizing existing ESCo accreditation programs, evaluating the existing accreditation program, compiling databases of references, and instituting complaint resolution services;

Table 1. Barriers and Possible Strategies for Overcoming These Barriers.

Barrier	Possible Strategies
Lack of customer awareness	Education by service providers and independent sources about opportunities and how to work with service providers; preparation of case studies of successful projects
Customer skepticism	Case studies of successful projects; publicize ESCo accreditation program; evaluate current accreditation program and how it can be improved; lists of satisfied customers for skeptics to contact; complaint resolution service; insurance; encourage customers to try one project (incentives for first project can help)
Contracting & verification confusing	Simpler contracts (perhaps standard contracts); refine and simplify verification procedures (balance benefits vs. cost)
Energy a low priority for most customers, no advocate, treat as commodity	Education by service providers and independent sources of the savings that are possible (generally greater benefits to customers than restructuring alone will provide) as well as benefits of in-house energy manager; case studies of successful projects; market in tandem power sales and energy efficiency services; incentives and monetization of additional benefits reduce this barrier and if initial projects are successful, maybe overcome in long term.
Don't want to disrupt operations	Case studies and referrals to demonstrate contractor competence; perhaps work in conjunction with established consultants who already have relationship with customer; flexibility in working with customer on scheduling—work at times that will have minimal impact
Complicated decision-making	Case studies of customers who have implemented simplified decision-making schemes and the benefits they have achieved; continue work to improve government procurement process
Reluctance to try new technologies & approaches	Appeal to financial decision-makers with financial analyses; encourage customers to try an initial pilot project (incentives will help); insurance; case studies of successful projects using new approaches/technologies
Limited local supply of capable firms	Encourage/incent local/national firms to set up local offices; provide training/advice for new local entrants; loan guarantees or insurance to reduce cost of capital; promote alliances with experienced firms
Shortage of experienced staff	Institute college level programs to help train entry-level employees; shorter training programs for people with some experience
High transaction costs	Streamline contracts and M&V; bundle several projects into a single contract; monetize additional benefits or develop innovative financing approaches to help cover transaction costs

3. Taking steps to reduce transaction costs, such as simplifying contracts (one ESCo respondent to our survey suggested the goal should be two pages), developing simpler/improved M&V procedures, and bundling multiple projects into a single package;

4. Offering incentives, particularly incentives to encourage customers to try an initial project and learn about available benefits firsthand;

5. Developing new creative finance options (for example, several respondents to our survey suggested on-bill financing for residential and small C&I customers) and monetization of additional benefits such as reduced air pollutant emissions (several ESCo's noted in our survey that they are now trying to convince the U.S. Environmental Protection Agency to award emissions reduction credits to end-users for performance contracting projects and not let credits reside with the local utility as is the present situation);

6. Experimenting with insurance to help reassure customers that firms and savings are dependable (although some ESCo's state that insurance adds to costs but does not provide much benefit to well-established firms);

7. Undertaking efforts to improve the local supply of energy efficiency service providers, such as technical and marketing assistance, loan guarantees, and insurance for new firms without a track record; and

8. Offering training programs for potential service provider staff.

CONCLUSIONS

ESCo's and other energy efficiency service providers have made substantial progress over the past two decades and now amount to a multi-billion a year industry. However, relative to the potential for energy-saving investments, the industry is still small. As the electric utility industry restructures, many states are establishing public benefit charges to fund energy efficiency and other public benefit programs. In some states, a portion of public benefit funds are being used for SPC programs, with the objective that these expenditures will make for a stronger energy efficiency services industry in the long term. In these states, as well as some other states, public benefit funds are also being used to fund market transformation programs that seek to identify and address barriers impeding the market development of specific energy-saving technologies and practices. At least two states (California and New York) are now seeking to combine these strategies by applying the market transformation approach to the development of the energy efficiency services industry. Such an approach involves identifying: market segments to target where intervention is needed and the likelihood of success; barriers that inhibit the development of the energy efficiency services market in these segments; and strategies that address, and hopefully overcome, these barriers.

This report explores these segments, barriers, and strategies in a preliminary manner. These explorations suggest that a market transformation strategy to promote the energy efficiency services industry can build upon straight SPC programs (whose primary goal is acquisition of energy savings) but should modify these programs in two fundamental respects. First, with a market transformation orientation, rather than target SPC resources broadly to all potential customers and measures, SPC resources should be targeted more carefully to: specific measures (e.g., higher incentives for non-lighting measures than lighting measures); sectors (e.g., emphasis on promising emerging energy services markets such as industrial, mid-size commercial, and large commercial that is not owner occupied); customers (e.g., establishing tight incentive per customer caps to spread incentives among many customers, thereby exposing more customers to the benefits of working with energy efficiency service providers); and service providers (e.g., giving some preference to service providers with a local presence and who provide some evidence that the they have a long-term commitment to providing services locally). Second, rather than put all resources into SPC's, the market transformation strategy should include saving some resources for complementary efforts such as: development of case studies and other education efforts; improved publicity for existing accreditation programs; evaluating these programs; and complementing them with a database of references and complaint resolution services; simpler contracts and simpler/improved M&V procedures; continued reform of the FEMP program so that substantial numbers of energy service projects can be implemented in federal buildings; experimentation with innovative financing approaches such as savings insurance, monetization of avoided pollution, and on-bill financing for small customers; and training programs for potential service provider staff.

However, while the market transformation approach holds significant promise for the development of the energy efficiency services industry, some humility is also called for. The energy services industry is full of innovative and entrepreneurial firms whose future health depends primarily on their own abilities and not public benefit programs. Public benefit programs can assist them but often will be working at the margins. Furthermore, in working with the energy services industry, care must be taken not to prop up weak firms at the expense of their more able competitors. In other words, programs and services must be competitively neutral. Also, many energy service firms work at the national level and respond to the most lucrative offers, wherever they lie. As states work to develop local energy efficiency service industries, the states need to take steps to encourage development of local roots, so that hard won gains are not lost to other regions.

This report begins to lay out how the market transformation approach can be applied to the energy efficiency services industry. Existing and emerging programs in California, New Jersey, and New York are also moving in this direction. Still, substantial additional work is needed to identify targets, barriers, and strategies so that future efforts to develop the energy efficiency industry can not only result in short-term energy savings but also in the long term a more robust industry.

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