The Remaining Energy-Efficiency Opportunities in Massachusetts

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ABSTRACT

The Massachusetts electric utility distribution companies have been leaders in the delivery of successful energy-efficiency programs since the late 1980's. The electric utilities have worked in cooperation with the Massachusetts' Department of Telecommunications and Energy (DTE) and other interested non-utility parties in the design and delivery of this important demand-side resource. The funding horizon for the current energy-efficiency charge sunsets in 2002 and the Division of Energy Resources (DOER) is mandated to assess whether funding should continue beyond 2002. This assessment is based upon barriers customers face to investing in energy efficiency, the economic and environmental impacts of such activities, and the extent to which the competitive energy-efficiency market is providing energy-efficiency services to customers. The focus of this study is to provide information that will support DOER's recommendation. Specifically, the RLW project team sought to answer the following key questions:

#1. What are the remaining energy-efficiency opportunities in the residential and commercial and industrial (C&I) customer sectors in Massachusetts[1]?
#2. What portion of these remaining energy-efficiency opportunities is likely to be achieved over the five-year period (2003-2007) absent further ratepayer funding[2]? Conversely, what proportion is likely to be achieved given continued ratepayer funding[3]?
#3. What market barriers prevent further development of competitive markets for energy-efficiency products and services, and how might these barriers be addressed?
#4. What is the current role of the evolving competitive energy service market in providing energy-efficiency products and services to customers, and how might that role change in the near future?

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[1] Specifically, we estimated the remaining economic potential savings. Economic potential is that portion of the energy savings available that is societally cost effective to install (i.e., all cost benefits were included). Economic potential between 2003-2007 indicates societally cost effective savings opportunities that are available during this period of time. It was important to bound the economic potential over a specific time horizon to accommodate the analysis of measures under replacement on failure and new purchase situations.

2 Specifically, we estimated 'Without Funding' savings. Without Funding is that portion of economic potential savings that would be achieved if energy-efficiency funding were to be discontinued; i.e., this potential is equivalent to naturally occurring energy savings. The impact of standard and code changes during the forecast horizon is captured in this scenario.

3 Specifically, we estimated 'With Funding' savings. With Funding savings is the portion of the economic potential savings that could be achieved given the continuation of recent DSM expenditure levels. Recent ratepayer funding for energy-efficiency programs is mandated to continue through 2002 at decreasing levels of 3.3 mills3/kWh in 1998, 3.1 mills/kWh in 1999, 2.85 mills/kWh in 2000, 2.7 mills/kWh in 2001, and 2.5 mills/kWh in 2002.

Project Overview

The directive for this study was to complete as much of the analysis as possible with secondary information. Primary data collection was reserved for customer surveys directed at identifying and classifying barriers. Table 1 presents the key questions and sectors studied in this evaluation, along with the data sources utilized to inform the team's response to each key question. These methods were adapted to each sector involved in the study to ensure that resources were utilized efficiently and in a way that best met the evaluation objectives. The spreadsheet analysis performed for the residential and small C&I sectors included identifying the relevant energy efficiency measures for analysis, determining which market events (retrofit, replacement, etc.) were appropriate for analysis, and determining remaining efficiency opportunities through use of secondary information. Data sources used in this analysis included, but were not limited to, impact evaluation savings estimates, the proportion of treated homes in programs for individual measures, market share results from previously performed Delphi panels, and past free ridership rates.

Table 1: Summary of Data Sources Used in Analysis of Sectors

	Sector			
Key Question #	**Residential**	**Small C&I (< 100 kW)**	**Medium & Large C&I (100 kW- 5,000 kW)**	**Very Large C&I (>5,000 kW)**
1	Spreadsheet Analysis of Secondary Data	Spreadsheet Analysis of Secondary Data	Triangulation of 'expert panel' and 'bottom-up' methods[4]	On-site Visits with Facility Walkthroughs
2	Spreadsheet Analysis of Secondary Data	Spreadsheet Analysis of Secondary Data	Triangulation of 'expert panel' and 'bottom-up' methods	On-site Visits with Facility Walkthroughs
3	Telephone Customer Surveys	Telephone Customer Surveys	Telephone Customer Surveys and Focus Groups	Telephone and on-site Customer Surveys and Focus Groups
4	Competitive Retail Supplier and Energy Service Company Interviews, and Secondary research on international experience and other U.S. experience			

The following sections present our answers to aforementioned questions.

Key Question #1: Remaining Economic Potential

What are the remaining energy-efficiency opportunities in the residential, and the commercial and industrial (C&I) customer sector in Massachusetts?

Since the late 1980s, the Massachusetts electric utilities working in cooperation with the Massachusetts' Department of Telecommunications and Energy and other interested non-utility parties have set a high standard in the design and delivery of energy-efficiency programs in the Commonwealth. In spite of this national leading effort, there continues to be a substantial amount of cost-effective energy-efficiency opportunities beyond the cost-effective measures that have been targeted.

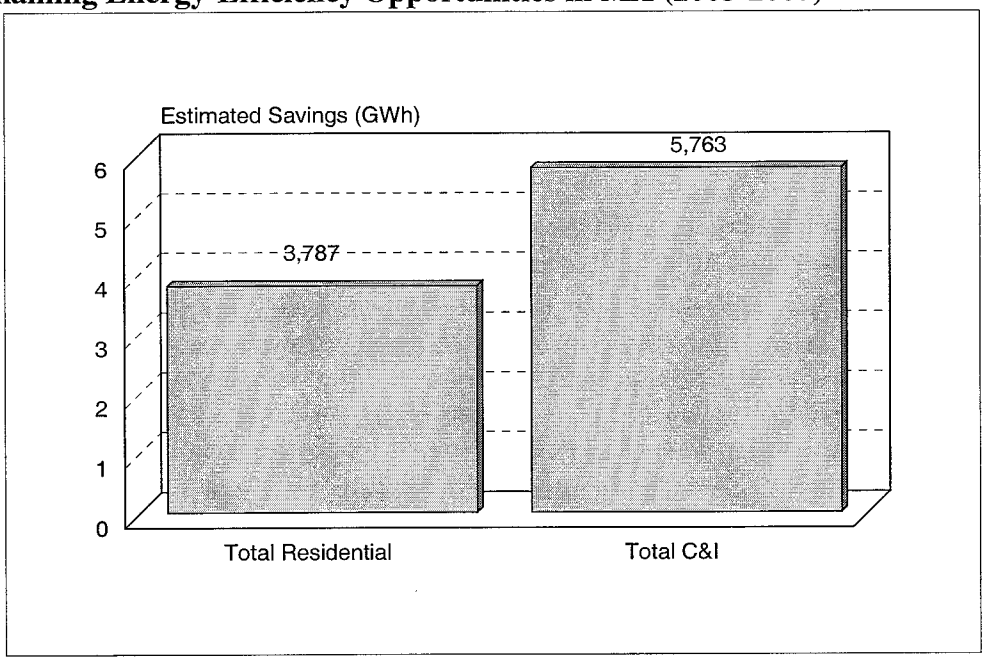
Figure 1 presents our estimate of the remaining energy-efficiency opportunities[5] (EE opportunities) from 2003 through 2007 by major customer sector. For the residential class, the EE

[4] The 'expert panel' approach is a 'top-down' method that utilizes the estimates of a panel of experts from both utility and non-utility parties. The 'bottoms-up' approach refers to the estimation of savings based upon group reports of past experience with selected facility improvements.

[5] The "remaining energy-efficiency opportunities" is generally defined as the economic potential of achieving electricity savings that are deemed to be cost-effective from a societal perspective. See technical appendices for further description and limitations of the economic potential analyses.

opportunities are estimated to be 3,787 GWh. For the residential class, this is approximately 31 percent of the annual class consumption from billing data from Massachusetts customers in 2000 (12,290 GWh). A relatively small proportion (5%) of these residential EE opportunities are estimated to come from emerging technologies. For the C&I sector, the remaining EE opportunities are estimated to be 5,763 GWh, or 21 percent of the annual class consumption from Massachusetts C&I customer billing data in 2000 (27,656 GWh). In contrast to the residential class, one-third of the C&I economic potential is estimated to be related to emerging technologies. The analysis of both sectors indicates ample opportunity for continued funding to achieve a significant reduction in customer electricity use.

Figure 1: Remaining Energy-Efficiency Opportunities in MA (2003-2007)



Key Question #2: With Funding and Without Funding Potential

What portion of these remaining energy-efficiency opportunities is likely to be achieved over the five-year period (2003-2007) absent further ratepayer funding? Conversely, what proportion is likely to be achieved given continued ratepayer funding?

Figure 2 summarizes our estimates under the "without funding" and "with funding" scenarios. This figure presents the results for each class and selected segments within the sector. The "with funding" estimates assume that funding levels would be similar to recent public expenditures.

For the residential sector, in the absence of ratepayer funding we estimate that customers would implement 332 GWh of savings, or approximately 9% of the total residential economic potential[6]. With continued ratepayer funding[7] (the "with funding" scenario) we estimate additional savings of 335 GWh over what would be achieved without funding, for a total of 667 GWh from 2003-2007. These incremental savings are double what would be achieved without continued funding and the combined savings are equivalent to 18% of the economic potential achieved during the 2003-2007 time period. Figure 2 also presents the total residential savings distributed between the single-family and multifamily customer segments. The majority of the savings (72%) are associated with the single-family segment.

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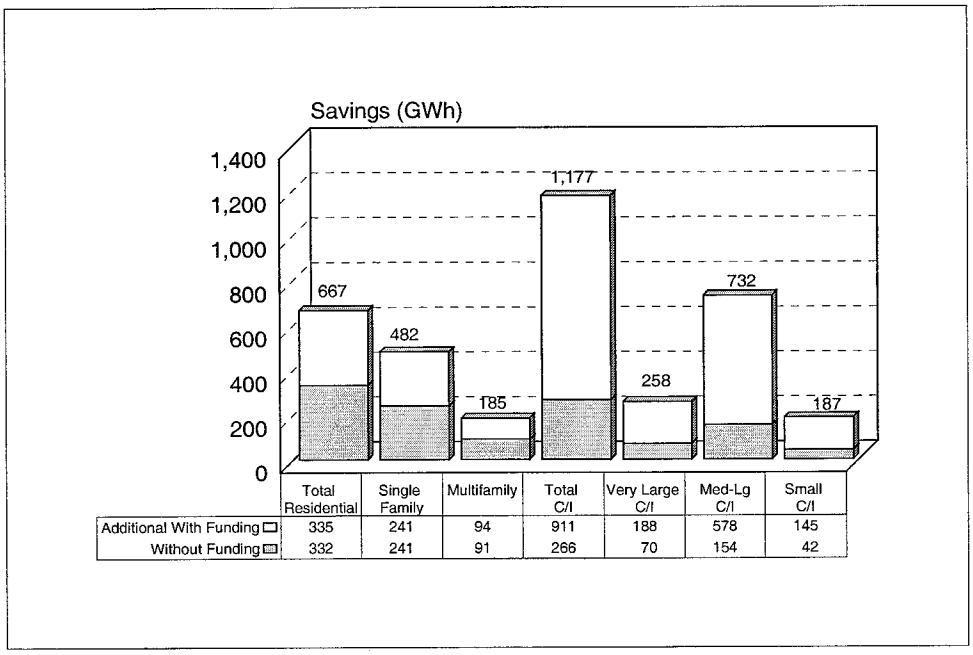
[6] Residential "without funding" estimates in this report do not include savings from low-income programs, for which funding is mandated indefinitely pursuant to the Electric Restructuring Act.

[7] The "with funding" savings estimate assumes funding levels of approximately 2.7 mills per kWh based on historical program expenditures over the period 1995 to 2000.

Figure 2: With Funding and Without Funding Savings (2003-2007)



	Total Residential	Single Family	Multifamily	Total C/I	Very Large C/I	Med-Lg C/I	Small C/I
Additional With Funding	335	241	94	911	188	578	145
Without Funding	332	241	91	266	70	154	42

For the C&I customer class, in the absence of ratepayer funding, we estimate savings of 266 GWh or less than 5% of the economic potential during the 2003-2007 time period. In contrast, under the continued funding scenario we estimate that an additional 911 GWh savings would be achieved, for a total of 1,177 GWh from 2003-2007. These incremental savings are nearly three and one-half times greater than the without funding scenario and the combined savings represent 20% of the economic potential. At the segment level, the majority of the savings are associated with the medium to large C&I customers. In addition to this group of customers, the very large C&I customers continue to present opportunities for substantial energy-efficiency savings.

There are some notable differences between the residential and C&I savings estimates. For instance, as noted above, the incremental savings for the residential sector under the "without funding" scenario is roughly equal to what would be achieved absent continued funding. For the C&I sector, however, additional savings from ratepayer-funded programs are estimated to be roughly 3.5 times greater with continued funding compared to without funding. A potential reason for this difference is that recent program activity has focused upon C&I potential savings which might tend to drive up the "with funding" estimate for the C&I sector relative to the residential sector. Another potential reason is that the without funding estimate for C&I was thought to be conservative, which could also be producing the observed difference.

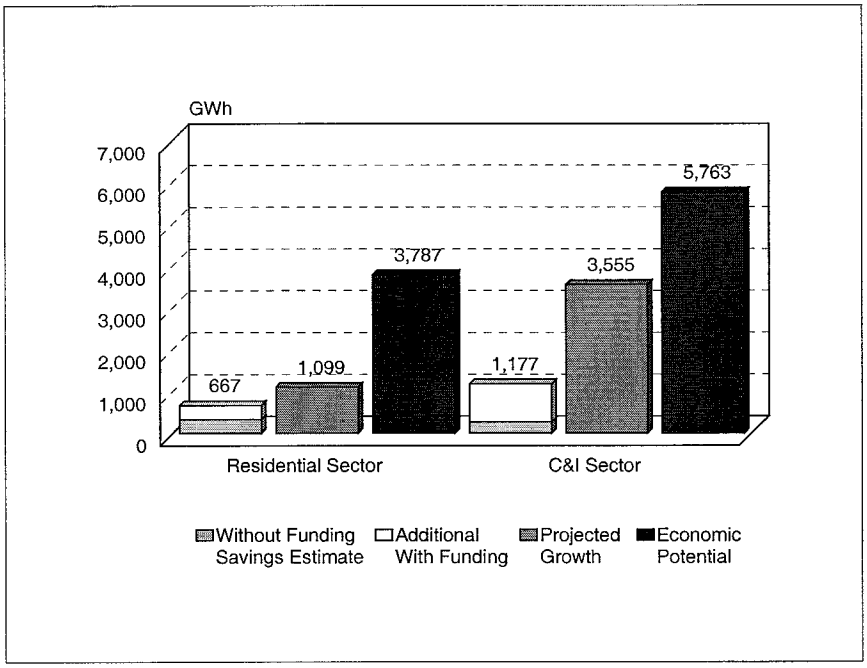
Figure 3 illustrates the impact that energy-efficiency savings would have in terms of offsetting projected growth[8] in electricity use over the period 2003-2007. Given 667 GWh of total savings acquired with continued funding in the residential sector, continuation of ratepayer-funded energy-efficiency activities would offset roughly 61 percent of forecasted growth for this sector over the five-year period. Similarly, for the C&I sector, Figure 3 compares potential with funding savings of 1,177 GWh with a forecasted growth of 3,555 GWh, thus offsetting electricity demand growth over this period by an estimated 33 percent. It is clear from the figure that the available savings (the economic potential)

[8] The projected growth values are based on forecasted sales developed by the electric distribution companies, which include downward adjustments to reflect anticipated energy-efficiency program savings. For the purposes of our analysis, these downward adjustments (based on historical program savings over past five years) have been excluded so as to appropriately reflect forecasted growth absent future funding for energy-efficiency programs.

far exceeds the forecasted growth, thus showing that if all remaining energy-efficiency opportunities could be captured, they would more than offset growth in electricity demand.

Finally, it is important to note that the savings estimates provided above do not account for additional savings that could be achieved under a "with *aggressive* funding" scenario in which new energy-efficiency programs and emerging technologies are targeted. While the research team estimated the magnitude of these potential savings over the 2003-2007 timeframe, as discussed in Section 4, the focus of this report is on the potential savings to customers under the "with funding" scenario.

Figure 3: Comparison of Savings Estimates with Projected Growth (2003-2007)



Key Question #3: Market Barriers and Strategies

What market barriers prevent further development of competitive markets for energy-efficiency products and services, and how might these barriers be addressed?

Historically, the Massachusetts distribution utilities have identified and targeted market barriers in the interest of improving the adoption of energy efficient products and services among their customers. Many elements of program design such as incentive levels and marketing strategies have sought to address identified market barriers and successfully moved particular measures beyond these barriers. While this study suggests that barriers reminiscent of those identified in previous studies remain within and among the various market players examined, it is important to note that they may be applicable to a different set of measures and practices. In this regard, it is important to note that utilities have moved many technologies into common practice by moving them beyond barriers, but new measures and technologies are experiencing the same barriers in the marketplace today.

As part of this study, we analyzed barriers that different types of customers face to investing in energy efficiency, as well as barriers that energy-efficiency service providers (EESP) and competitive retail suppliers (CRS) encounter in selling energy-efficiency products and services to customers.

Residential Customer Barriers. A survey was conducted to identify market barriers that residential customers face to investing in energy efficiency. The survey focused on questions regarding three technologies: compact fluorescent lamps (CFLs), refrigerators, and air sealing. Table 2 below summarizes the primary barriers identified for each technologies, and provides recommended strategies

to overcome the highest identified barriers for CFLs and refrigerators, and broad marketing strategies to develop understanding and knowledge about air sealing. These marketing measures are recommended with the assumption that many barriers relate to a lack of education and understanding about the energy efficient product or measure, and recognizes that purchasing decisions are more than just rational economic choices. It is important to note that while the barriers are based upon survey results, the strategies to overcome the barriers are based upon the teams past experience and opinions.

Table 2: Residential Market Barriers and Strategies

Barriers and Strategies to Overcome Residential Barriers	
CFLs – Lack of availability, lack of awareness.	Work with manufacturers to develop retail sales: co-op advertising opportunities, spiffs for desirable shelf placements, and high visibility end cap displays
Refrigerators–Asymmetric information, first cost, and access to financing.	Continue to provide Energy Star marketing campaign to customers Improve and enhance countertop displays and materials that clearly show real-life savings projections for Energy Star labeled refrigerators Provide funding for easy eligibility low-cost/no-cost financing of Energy Star labeled refrigerators
Air sealing – general lack of understanding and knowledge.	Subsidize demonstrations at home improvement centers Create and implement promotional and descriptive newspaper and radio advertising Create first hand knowledge and word of mouth marketing in targeted neighborhoods by giving away free installations at home shows, chamber of commerce events, and other community functions

C&I Customer Barriers. The research team conducted a market barrier survey across a wide spectrum of C&I customers. The following tables summarize the findings of the C&I barrier research. Table 3 highlights specific market barriers encountered along with potential strategies to help overcome these barriers. For this presentation, we grouped these barriers into four categories: 1) Practices and Values, 2) Unavailability and Performance Uncertainty, 3) General Complacency, and 4) Lack of Perceived Need.

Table 3: C&I Market Barriers and Strategies

Barriers and Strategies to Overcome Practices & Value	
Long Payback	Education on long term operating costs, promotion of grants, quantification of non-energy and non-electric savings.
Inadequate time, financing difficulty	Provision of audit services and/or low-cost/no-cost financing may alleviate need for customer to have staff available to perform services on own or to have the money readily available.
Training too costly	Provision vendor of free/low cost group training, promote available low-cost training by non-profits or government agencies.
Barriers and Strategies to Overcome Unavailability & Performance Uncertainty (Risk)	
Some EE equipment is difficult to get	Identify specialized and qualified vendors and bulk purchasing programs. Encourage manufacturers to produce more efficient equipment & reduce unit costs.
Performance Uncertainty	Utilize case studies and testimonials. Facilitate customer-to-customer networking. Conduct emerging technology workshops. Provide performance guarantees. Utility quality control and co-investment increases customer's confidence.
Lack of trust for EE contractors	Develop project standards, facilitate contractor/user breakfast meetings. Provide utility sponsored energy-efficiency 'consumer protection' service, provide contractor training and qualification services (such as teaching how to market higher-end services and how to show customers there is a predictable return and more reliable service associated with those premium services), develop joint utility/contractor projects to define and market premium services.
Barriers and Strategies to Overcome General Complacency	
Reducing electric costs not important	Provide benchmarking services for specific industries.
Does not understand major electric end-uses	Provide quick and easy tools to estimate energy costs.
Does not track energy usage	Educate about value of tracking costs, and promote efficiency based upon societal and environmental performance. Demonstrate to the customer that real-time metering can provide useful information for managing demand and energy aspects of the customer's load. Furthermore, real time metering allows the customer to participate in current and future load management offerings.
Barriers and Strategies to Overcome Lack of Perceived Need	
Happy with current lighting design/HVAC	Promote new lighting and HVAC technologies, provide lighting design workshop, provide newsletters on available technologies, develop case studies showcasing lighting design projects (or testimonials), provide HVAC technology reports.
More important things	Identify links between efficiency improvements and customer priorities.
No additional energy-efficiency opportunities	Provide benchmarking services for specific industries.

Table 4 presents a ranking of each factor based on the survey responses in each C&I sector of interest. The closer the barrier is to "5" the more likely that the barrier still exists within the particular sector (all scores 3 and above are highlighted in bold). As evidenced by the table, Small C&I perceive more barriers preventing them from pursuing energy-efficiency activities. Generally, barriers appear to be associated with the size of the customer, with most gradually diminishing as customer size increases, although Practices and Value appears to be relevant to all customers surveyed. In fact, no factor received a score above 3 in either the very large C&I sector or the large commercial sector.

Table 4: Barriers by Sector

Factor	Small C&I	Medium Com.	Medium Ind.	Large Com.	Large Ind.	Very Large C&I
Practices and Value	**3.65**	**3.51**	**3.54**	2.98	**3.14**	2.73
Lack of Availability or Performance Uncertainty	2.50	2.47	2.56	2.39	2.38	1.54
General Complacency	2.01	1.87	1.88	1.64	1.68	1.47
Lack of Perceived Need	**3.27**	2.77	2.98	2.90	2.82	2.79

In addition to customer surveys, focus groups were conducted for Large and Very Large C&I customers. When asked about factors that limited or blocked approval of energy efficiency projects, focus group members described and elaborated on issues and concerns consistent with those discussed in the survey results regarding barriers that affect large and very large C&I customers, including the following:

- Many proposals for energy-efficiency improvements in this sector were subject to the same barriers that impede energy-efficiency projects for smaller, less knowledgeable companies, such as limited knowledge about certain technologies and split incentives.
- The most serious barrier for most focus group members was the set of internal practices at their companies. These practices included not only stringent requirements for payback or return on investment, but also strong competition for internal resources against projects offered by other departments.
- As would be expected, hassle or transaction costs as well as concerns about potential inconveniences to customers may act as barriers to energy-efficiency projects. Examples of transaction costs include changes to production facilities or operating hours. Potential inconveniences to customers include such things as changes in lighting quality.

The focus groups also gathered other important information on the large and very large C&I sectors. First, the focus groups indicate that many projects undertaken by these sectors are motivated by factors other than an interest in energy efficiency *per se*. These factors include interest in improved load factors, fuel-switching, and demand reduction. Second, many of the large and very large C&I customers have participated in energy conservation programs in the past, and indeed several have participated more than once. Third, electric ratepayer energy-efficiency funding has been of considerable value to this sector, both with respect to supplementing internal funding and the value of technical assistance provided through the electric utility administered programs. Fourth, large and very large C&I customers generally do not find the current efficiency offerings of competitive retail suppliers to be of high value.

Energy-Efficiency Service Provider and Competitive Retail Supplier Barriers. EESP and CRS virtually ignore the residential and small C&I customers primarily due to the high acquisition or transaction costs, customer education barriers, low gross profitability, and the separation of motivations between a property owner and renters. EESP and CRS appear to generally follow the 'easy money path'. EESP and CRS cited a litany of internal barriers (i.e., within the company) and external barriers (i.e., outside the company) preventing their firms from offering energy-efficiency services to different types of customers.

The major internal barriers and obstacles to the provision of energy efficiency services include:

- Some CRS firms are too small for EESP and CRS to provide a broad menu of services or to offer energy services,
- The return on energy-efficiency offerings do not meet CRS profitability requirements, and

- Energy-efficiency services are complex and require a degree of expertise or staffing that is beyond a CRS's willingness to invest at this time. Also, EESP do not spend significant time engaging large customers with their services.

The major external barriers and obstacles to the provision of energy efficiency services include:

- The economic climate, as it relates to low perceived energy costs (at least relative to other expenditures),[9,10]
- Requirements to provide supplier credits, ancillary services, and reserves at the front end of CRS offerings (e.g., provision that requires all suppliers to comply with the backup and safety requirements of traditional utilities),
- Considerable time and effort is needed to educate customers contacted by CRS and EESP about energy efficiency (i.e., high transaction costs),
- Financial concerns stemming from corporate practices for C&I customers, e.g., the need to meet mandated payback or rate of return criteria (indicates the loss of momentum for energy-efficiency projects as they move up the corporate ladder),
- Costs involved in shutting down service to accommodate improvements (e.g., shutting down an assembly line) for some industrial customers, and
- Some commercial customers are dependent on access to financing, which requires sellers to bring capital funding to the project.[11]

Other barriers and obstacles to the provision of energy efficiency services include:

- The lack of attention given to energy issues by C&I customers in cases where energy costs are a very small proportion of the budget,[9]
- Some industries where energy is a crucial input have their own expert staff and thus a limited need for external resources (a barrier to using CRS/EESP, but is a positive result overall),
- The long decision cycles that characterize some large, complex customers increasing transaction time, and therefore, costs, and
- Difficulty in changing some residential customer behavior/habits regarding electricity use.

Key Question #4: Role of the Energy Service Market

What is the current role of the evolving competitive energy service market in providing energy-efficiency products and services to customers and how might that role change in the near future?

CRS fail to deliver energy efficiency to a broad customer base. A fundamental reason that CRS are not providing energy-efficiency services to a broad customer base in Massachusetts stems from the fact that a competitive market for electricity services has yet to develop due to low competing standard offer rates[12]. Table 5 presents data[13] on migration of Massachusetts customers from their local distribution company to CRS firms. These migration data support the information collected from the CRS interviews. Only among large C&I accounts have the CRS made any inroads to selling electricity to customers -- and their market share in that sector is well below 10%. In no other sector have more than one percent of the customers switched to CRS firms for power services. Thus, even if energy-efficiency offerings from CRS were successful, they would represent a miniscule portion of the customer base that would be receiving energy efficiency from those providers in the near future.

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[9] It should also be noted that the interviews took place before the effects of any 2001 rate increases.

[10] It was reported by a non-utility party representing medium/large C&I customers that corporate management typically takes notice of energy costs when they exceed 2% of the cost of goods or services.

[11] CRS report that, in contrast to commercial customers, industrial customers typically have ready access to capital.

[12] Standard offer rates are set to expire in March of 2005.

[13] These data were provided by MA DOER and are for February 2001.

Table 5: Status of Customers Migrating to CRS

February 2001	Competitive Generation				% Competitive	
	Total Number of Customers Switched to Competitive Generation (A)	GWh of Competitive Generation Used for Month (B)	Total Customers (C)	Total GWh Sales (D)	Customers (A/C)	Energy (B/D)
Residential	2,514	2.91	2,061,164	1,267.19	0.12%	0.23%
Small C/I	145	1.98	247,824	376.09	0.06%	0.53%
Medium C/I	205	13.07	20,733	650.85	0.99%	2.01%
Large C/I	411	180.44	6,164	1,337.26	6.67%	13.49%

It remains to be seen whether involvement of CRS in the market results in any increase in efficiency investment or just a transfer of work from other EESP. In our interviews there were few CRS that believed that efficiency services played a key role in the sale of electricity. It is possible (albeit difficult to predict) that this may change if higher electricity prices persist, as a larger competitive market for electricity sales develops, and as customers master commodity purchasing and therefore have the time to pursue more sophisticated packages that include bundled efficiency/power products. There were several CRS that indicated that they would reassess launching energy-efficiency services when full retail competition occurs in Massachusetts. However, the interviews support the notion that even in states where deregulation has matured there is still limited energy-efficiency services offered by CRS.

The residential, small commercial and industrial sectors are underserved. CRS indicated that residential customers get the least amount of attention because of an education barrier, a lack of interest, and a lack of profitability. There were no CRS that served just residential customers in the sample contacted. Many of the same barriers were reported by EESP as the reasons why they do not target the residential and small C&I market. In the interviews, CRS reported that they concentrate on the large commercial, industrial, governmental, and institutional areas for both their sale of commodity and energy services.

Generally, CRS firms seek large customers who are currently inefficient, have a sizeable portfolio of buildings, a corporate commitment to improve energy efficiency, and centralized decision making and control over satellite sites. While it is clear that there are large customers with opportunities according to the very large on-sites, it is difficult to determine the number of customers that meet the criteria of an 'ideal' customer from the CRS point of view. There may be other customers that CRS would provide services to that are less profitable than this 'ideal' customer, but the interviews seem to suggest that they (the CRS) are not aggressively targeting them.

EESP reported they target commercial, government and institutional, but do not target industrial and residential customers. In addition, EESP "ideal" customers were described as having either a project that is at least $1 million, a bill over $100K or more, or a size of at least 100,000 square feet. While it is difficult to assess how many customers in Massachusetts meet these conditions, it is clear that the majority of customers do not appear to be profitable by these standards. This is despite the analysis discussed earlier, which indicates significant energy savings opportunities among the C&I sectors for EESP to target. Both the CRS and EESP ideal customers do not appear to include the residential or small C&I markets.

CRS entrance into the market is seen as positive by EESP. The entry of more competitive retail suppliers is seen as making a positive impact in raising customer awareness and broadening the market, but at the same time some EESP perceive that the entry of such firms may impinge on their own market share. The competitiveness of the standard offer rate in Massachusetts is having a dampening effect on the entry of CRS into the state and therefore the synergy between these market actors.

Many EESP are dependent on energy-efficiency funding. Many EESP are dependent on the energy-efficiency funding and the education and awareness generated by ratepayer-funded programs to sustain their level of project work. In fact, 19 EESP respondents reported that an average of 67% of their projects use MA energy-efficiency funds. Specifically, 70% of the traditional Energy Service Companies (ESCOs) contacted, 100% of the Medium sized EESP contacted, 100% of the design/architectural/engineering firms contacted, and 40% of the Trade companies contacted reported that they use these funds. In addition, it was reported by respondents that an average of 55% of their projects would be negatively impacted if MA energy efficiency were to cease, driven primarily by medium-sized EESP firms and Design/architectural/engineering firms that reported that between 71%-73% of their projects would be negatively affected. It is important to note that it is not known what size projects the 55% estimate would include, nor whether future EESP projects would receive funding due to changing energy-efficiency program criteria.

EESP are optimistic about their growth potential in Massachusetts. EESP are optimistic about their growth potential in Massachusetts, based upon questions regarding expected growth trends over the next 2-3 years. Anecdotally, respondents seemed to feel that continued funding contributed to this optimism. This includes likely opportunities for performing efficiency services outsourced by CRS.

Recommendations

The following recommendations are based predominantly upon the findings of this study. However, this study also included a review of national and international experience, which suggested that information available from other more fully deregulated markets should be considered as part of the process of deciding whether to continue funding to support residential and C&I energy-efficiency programs. Preliminary results from these deregulated markets suggest that public funding of efficiency is paramount to ensuring continued energy conservation following deregulation in some sectors.

Residential Energy Efficiency. Based upon the results from this study, the research team believes that funding of residential sector energy-efficiency programs will be necessary if the policy goal is to capture a considerable portion of remaining energy-efficiency opportunities over the forecast horizon. This recommendation rests on the following points:

1. The projections of economic potential remaining in the residential sector that can be achieved indicate a significant opportunity for continued funding to target. Only 332 GWh of savings would likely be achieved in the absence of such funding, whereas twice that amount would be achieved if funding were to continue at levels consistent with recent expenditures. Under a more aggressive funding scenario, which would target new programs and emerging technologies, an even higher percentage of the estimated savings potential could be achieved.
2. Continued funding for the residential sector appears to be particularly important as EESP and CRS interviews indicate that little activity is being directed to this marker with the exception of EESP who participate in ratepayer-funded programs as a vendor (e.g., program implementers).
3. Continued deliberate, well-designed, and carefully targeted interventions to address obstacles to the adoption of energy efficient alternatives by consumers in the marketplace. Such programs will not be mounted in the absence of public funding.
4. The instabilities seen in other deregulated markets carry the risk of reliability problems and volatile energy prices. The research team believes that continued funding of these programs will help buffer customers from high energy prices.

C&I Energy Efficiency. The research team believes that funding of C&I sector energy-efficiency programs will be necessary if the policy goal is to capture a considerable portion of available electricity savings over the forecast horizon. This recommendation rests on the following points:

1. The projections of economic potential remaining in the C&I sector that can be acquired indicate a considerable opportunity for continued funding to target. Specifically, in the 2003-2007 time period, 1,177 GWh would be saved with funding continued at levels consistent with recent expenditures. However, there is limited likelihood of these savings being achieved in the absence of continued funding, with a mere 196 GWh of savings, or 3% of the economic potential. The Small C&I sector in particular appears to be the least likely to achieve significant savings without incentives.
2. Emerging technologies represent a significant opportunity for energy savings within the C&I sector, particularly within the Very Large C&I sector. This suggests that early promotion of these technologies by the utilities or third parties is necessary to ensure the potential savings arising from these technologies are realized. However, this would require higher funding levels than recent expenditures.
3. Continued, deliberate, well-designed, and carefully targeted interventions to address obstacles to the adoption of energy efficient alternatives by C&I consumers in the marketplace. This report provides suggested strategies to overcome the specific barriers identified. These barriers are most prevalent in the Small C&I sector.
4. Competitive Retail Suppliers are not providing energy-efficiency services to a broad base of customers. Specifically, interview results indicate that market dynamics such as the competitiveness of the standard offer and associated lack of migration of C&I customers to CRS has slowed the maturation of a competitive market in Massachusetts (one respondent estimated that the actual cost of supplying retail customers is up to 50% higher than what the retail customer can get under default service rate). The CRS market players are still struggling to make money on the electricity commodity with the small margins currently available. This leaves CRS little incentive to embrace added value services such as energy conservation.
5. The extent to which any energy-efficiency services are being provided to customers focuses on the large C&I sector. In addition, the small and medium C&I marketplace continues to show little demand for efficiency services, as customers do not appear to be fully aware of savings opportunities. The education process is still very long and transaction costs are high among C&I customers as well. The reported lack of profitability in certain C&I segments (especially the Small C&I market) is also hindering the provision of efficiency services by CRS and EESP firms alike. Utility intervention and funding still appears to be needed in order to provide small C&I customers the opportunity and means of reducing energy usage.
6. There appears to be strong support among EESP for maintaining existing funding. The majority feels that the success of many of their projects would be compromised if efficiency funding were to be eliminated.
7. Reorganize program participation databases from a corporate perspective to develop tools that can better assess the program participation of large and very large C/I companies. This may also help in identifying and contacting the responsible professionals in large and very large companies. In addition, improve account executive effectiveness through such mechanisms as reduced turnover and increased use of customer feedback on knowledge and responsiveness. Encourage utility account executives to attend to motivators other than energy efficiency when assessing a company's potential for program participation, to the extent that they do already not do so.