

Transforming the Motor Market - Lessons Learned from New Jersey

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ABSTRACT

Public Service Electric and Gas Company (PSE&G) implemented the Motors Pilot Program (MPP) in March 1997 to capture conservation savings; develop and evaluate the MPP delivery mechanism; and begin the motor market transformation process. To evaluate this program, PSE&G developed a three-year program evaluation strategy. The first-year effort reported in this paper focused on examining the delivery mechanism and obtaining insight into initial market effects of the program. This paper presents the market effects related to the key market barriers PSE&G identified and compares the findings with baseline data where available. PSE&G's program was successful in creating awareness of qualifying motor efficiencies among participants but it did not show other measurable market effects during the first year. We then describe major difficulties encountered in conducting this evaluation and present the lessons learned. Our findings validate certain aspects of the theory (ies) of market transformation and highlight other aspects that may suggest reassessing the ways in which market transformation programs are designed, implemented and evaluated.

Introduction

Public Service Electric & Gas (PSE&G) implemented the Motors Pilot Program (MPP) in March 1997 to capture conservation savings by promoting the use of premium efficiency motors. The program was designed as a three-year program but program details were finalized only for the first-year. The MPP was preceded by the baseline study conducted in 1996 by Easton Consultants, who concluded that sales of premium efficiency motors were modest in New Jersey and in PSE&G's service territory. Another reason for promoting premium efficiency motors was the advent of the EPACT standards in October 1997. The EPACT standards were expected to make less-efficient pre-EPACT motors obsolete, leaving consumers with a choice of EPACT-conforming motors and premium efficiency motors. This situation provided an opportunity to move customers to higher levels of efficiencies compared to those mandated by the EPACT standards.

For pilot qualifying motors, PSE&G selected the motor efficiency criteria developed by the Consortium for Energy Efficiency (CEE) which significantly exceeded the EPACT standards¹ and premium efficiency motors available from manufacturers. The majority of PSE&G qualifying motors were available in New Jersey. The program was directed at vendors, who play an important role in

¹ Four motor efficiency standards/criteria referred in this paper are: (1) Pre-EPACT motors, popularly known as standard motors that are no longer manufactured after October 1997, (2) EPACT motors, i.e., motors manufactured after October 1997 that meet the minimum efficiency standards specified in EPACT, (3) premium efficiency motors with efficiencies somewhat higher than those specified for EPACT motors, and (4) CEE motors or PSE&G qualifying motors that meet the CEE efficiency criteria, which generally exceed the efficiencies of premium efficiency motors.

promoting and making premium efficiency motors available, and at customers who offer potential for changing their buying practices in favor of qualifying motors. The program was limited to motor sizes from 1 hp to 50 hp – a range that accounted for about 97% of motor sales in PSE&G's service territory. Customer incentives offered by PSE&G were designed to cover the incremental cost to the customer of buying a PSE&G qualifying motor. Vendors were offered incentives for the first six months of the program to encourage them to stock and promote qualifying motors.

Program Goals and Objectives

PSE&G's major goals for the MPP were to: capture conservation savings; develop and evaluate the MPP delivery mechanism; and begin the motor market transformation process by creating conditions whereby vendors and customers would select qualifying motors without formal intervention from PSE&G. The MPP objectives were: to increase the availability and sales of qualifying motors in PSE&G's service territory; increase the promotion of qualifying motors; change motor stocking practices in favor of qualifying motors; increase the number of vendors who stock qualifying motors; and change customer purchase practices in favor of qualifying motors.

Program Evaluation Strategy

To evaluate this program, PSE&G developed a three-year program evaluation strategy, which included process, impact and market transformation evaluations. PSE&G recognized that first year evaluation efforts do not lend themselves to high levels of measurable precision. Thus the focus in the first year was to examine the delivery mechanism and obtain insight into initial market effects of the program, within the constraints of a small sample.

The market transformation evaluation goals were to assess, with a low-level of precision: the availability of qualifying motors; the effectiveness of the program to encourage a change in vendor stocking practices, vendor awareness, and the number of vendors stocking qualifying motors; sales trends for qualifying motors; the effectiveness of the program to change customer purchase practices and to create awareness of qualifying motors; and trends in the price differences between pre-EPACT, EPACT and qualifying motors.

Methodology

We structured the evaluation to address PSE&G's main objectives for the First Year process, impact, and market transformation evaluations. Data sources for the market transformation evaluation included program databases and vendor and customer surveys.

Motors Pilot Program (MPP) Materials and Databases

Tools and information distributed to vendors and customers through the program were reviewed. The program database was reviewed for program profile, data quality and accuracy, comprehensiveness, and compliance with the qualifying efficiencies.

On-site and Telephone Surveys with Participating and Non-participating Vendors

The evaluation team conducted 30 to 45-minute on-site surveys with nine participating vendors and one non-participating vendor. We also conducted 15-minute telephone surveys with thirteen participating and two non-participating vendors. The surveys included questions about sales and stocking of premium efficiency and qualifying motors; knowledge and attitudes toward premium efficiency and qualifying motors; knowledge and awareness of changes in the federal motors standards; awareness, use, and perceived value of the MPP program and its features; and an exploration of how vendors promote premium efficiency motors to their customers.

On-site and Telephone Surveys with Participating and Non-participating Customers

The evaluation team conducted 45 to 60-minute on-site surveys with four large participating customers and one non-participating customer. We also conducted 10 to 15-minute telephone surveys with four large participating customers and ten large non-participating large customers. Telephone surveys with 50 small participating and ten small non-participating customers were conducted. The survey included questions about decision making in the purchase and inventory of motors; awareness of and reaction to PSE&G's program; knowledge of and interest in premium efficiency motors; use of information provided by PSE&G's program; and vendor role in purchase of premium efficiency motors. Table 1 Summarizes the survey sample.

Table 1. Summary of the Survey Sample

Survey Type	Vendors	Large Customers	Small Customers
On-site participants	9	4	
On-site non-participants	1	1	
Phone participants	13	4	50
Phone non-participants	2	10	10

Market Effects of the MPP Program

We present below our findings on the initial market effects, i.e., sales of qualifying motors, pricing of qualifying and premium efficiency motors, motor availability, customer awareness and customer purchase practices.

Sales Trend and Market Share of Qualifying Motors

Pre-Program Year. To assess the change in market share of qualifying motors, we asked vendors to describe changes in their sales since program implementation. In an effort to gauge the sales of PSE&G qualifying motors prior to the program, we asked vendors to estimate, before March 1997, the number of premium efficiency motors in the 1-50 hp range sold annually in PSE&G's service territory. Then we asked them to estimate how many of these would have qualified for the program.

Responses from small vendors were often inconsistent or incomplete, and were discarded from further analysis. Seven out of nine large vendors provided data on the sale of qualifying motors during the pre-program year. Two large vendors did not have the required information. Six large vendors indicated that they were selling qualifying motors in the pre-program year; one did not sell any qualifying motors during that time. These six large vendors sold 391 qualifying motors in the pre-program year or about 12.6 percent of 3,108 motors sold by them in the 1-50 hp capacity range. One large vendor had a project-specific sale of qualifying motors in the pre-program year that accounted for about half of the firm's sales volume in the 1-50 hp range. The share of qualifying motors in the 1-50 hp capacity range, excluding the project-specific sales of this large vendor, was 5.4 percent.

Program Year. Since the data from small vendors were incomplete or inconsistent, we used the data on large vendors to analyze the share of qualifying motors during the program year. In addition to the information we had on the number of motors rebated by large vendors, we also asked them if they sold qualifying motors during the pilot program year for which they did not request a rebate. Three vendors had sold 55 qualifying motors for which they or their customers did not apply for rebates. Adding these to 323 motors rebated by these vendors during the program, we calculated the total number of qualifying motors sold by these vendors during the program year at 378 or 10.7 % of their sales volume in the 1-50 hp range. The number of qualifying motors sold is slightly less than the previous year (378 versus 391 motors, or 10.7 % versus 12.6% in the pre-program year).

We then adjusted the program year sales of qualifying motors by eliminating the number of rebated motors sold by a vendor who could not provide information on their total sales during and before the program year. We also eliminated the large vendor who had a project-specific sale that distorted the results. With these adjustments, we estimate the share of qualifying motors during the program year as 7.2% - higher than the pre-program year share of 5.4% for the similar group of large vendors. The baseline study estimated the market share of qualifying motors at 5-7 percent of motors sold in New Jersey and our estimate falls almost within this range. Considering small sample size and low precision in the sales data collected from vendors, we believe that the market share of qualifying motors did not measurably increase during the first year.

Price Trend

In designing the rebate pilot, PSE&G understood that price hikes expected as a result of EPACT would reduce the incremental costs for qualifying motors; i.e., the prices of EPACT motors would come more into line with the prices of premium efficiency lines. It was also expected that program-generated, long-term demand for qualifying motors might help to contain price increases for qualifying motors. To explore the pricing changes, we asked vendors to identify the nature of this change and the magnitude in the following categories: EPACT motors compared to non-conforming motors of the pre-program year; premium efficiency motors; and qualifying motors.

Small vendors interviewed said that the net price of premium motors had increased for all efficiency categories. There was great variation, however, in their estimates of the magnitude of this change. Large participating vendors interviewed on-site indicated that the price of EPACT motors had increased about 8.8% whereas the price of premium and qualifying motors increased about 2.8% compared to the previous year, narrowing the difference in incremental costs. While the decrease in

incremental costs would help in lowering the rebate level during the second program year, we note that price changes were due to the advent of the EPACT standards.

Motor Availability²

We wanted to determine if the program influenced vendors into stocking more qualifying motors. Another indicator of motor availability we used was the share of motors listed in the major motor manufacturers' catalogs that met the CEE efficiency criteria.

Vendor Stocking Practices. We asked vendors to describe their motor stocking practices during the program year (March 1997 to March 1998). Only four of the nine large vendors could provide complete information on the number of motors stocked but seven large vendors provided information on the relative changes - overall and for qualifying motors during and prior to the program year. Five of these seven large vendors indicated that there was no change in their inventory of qualifying motors before and after the program. One large vendor indicated a five percent increase, and another indicated a 100 percent increase in the number of qualifying motors stocked because of a new corporate policy that mandated stocking only premium efficiency lines. Therefore, we conclude that the MPP did not have a significant impact on the stocking practices of large vendors during the first year but it did increase vendor awareness of the qualifying efficiencies. One large vendor pointed out, "we do not take into account PSE&G's qualifying requirements while making stocking decisions."

Motor Models. The Easton Baseline Study estimated that overall 60% of premium efficiency models available in New Jersey qualified for the program but data were not available separately for motors in the 1-50 hp capacity range. We found that three of the five major brands had a dominant share of motors rebated in the program and almost all premium efficiency models of these three brands met the qualifying efficiency requirements. Another brand did not have qualifying motors in several capacity ranges according to the Motor Master+ database. The premium efficiency line, offered by another dominant brand, does not appear to have qualifying motors in most capacity ranges. We conservatively estimated that 65-70% of premium efficiency motors available in the 1-50 hp range met the qualifying efficiency requirements. This is about the same as the baseline estimate.

In response to our questions, customers mentioned non-availability of qualifying motors as an important factor (second most important reason after higher first cost) in making motor purchase decisions; therefore, we wanted to examine the extent to which this really prevented them from participating in the program. In our review of customer reasons for non-participation, we found non-availability of qualifying motors was not often cited as a reason for non-participation, and only one of seven large vendors interviewed on-site mentioned non-availability of qualifying motors as a reason for sales lost in a few instances. We conclude that non-availability of qualifying motors does not appear to be a market barrier in PSE&G's service territory.

Customer Awareness

² The Easton baseline study did not find motor availability or vendor inventory levels as market barriers

Customer or vendor awareness of qualifying motors was non-existent during the pre-program year because qualifying motors were not offered by motor manufacturers as a separate line. Therefore, to assess if lack of awareness affected program participation, we used customer awareness of premium efficiency motors and PSE&G's program as a proxy of customer awareness of qualifying motors. Nine out of 11 large non-participants and six out of ten small non-participants were aware of premium efficiency motors, and nine out of 10 large non-participants and six out of 10 small non-participants were aware of PSE&G's program. This suggests that factors other than lack of customer awareness of PSE&G's program and premium efficiency motors might have prevented non-participants from participating in the program.

Customer Purchase Practices

We reviewed current motor procurement practices of all customers and changes in these practices after participation in the program. Highlights of current procurement practices are listed are:

- Most large participants and non-participants have multiple decisionmakers.
- Large customers are more likely replace smaller motors instead of rewinding upon motor failure.
- More than half of large customers (10 of 18), had standard motor specifications for purchases but only three participating customers specified premium efficiency.
- Most large customers have plant-specific purchase policies and adhere to them.
- Five out of eight large participants and 35 out of 49 small participants reported maintaining motor inventory. A majority of participants stocked some premium efficiency motors. Most non-participants maintained motor inventory but rarely stocked premium efficiency motors.

Although large customers were aware of premium efficiency motors, only a small fraction has included premium efficiency motors as their purchase standard. Further, the share premium efficiency motors in customers' motor inventory is low which suggests that an opportunity exists to change their buying practices. The program has not moved a majority of customers from the awareness stage into purchasing premium efficiency or qualifying motors. The program, however, shows promise to change this over time as indicated by customer response to their future purchase plans. Six of eight large participating customers (five plan to purchase, one plans to consider) and 42 (26 plan to purchase, 16 plan to consider) out of 50 small participating customers said they consider or purchase premium efficiency or qualifying motors.

Lessons Learned

We encountered several challenges in conducting the first-year evaluation of PSE&G's program, which was implemented during the year the EPACT standards became effective. The advent of EPACT standards was expected to confuse customers and vendors about the new federal standards, premium efficiency lines and the CEE efficiency levels; but, this dynamic situation did not affect program participation. We found it difficult, however, to discern definitive trends in pricing because manufacturers had not firmed up pricing of their motor lines. Prior to the program year, the qualifying efficiency levels were not known to vendors or customers in PSE&G's service territory. In exploring customer purchase practices and similar questions, we had to combine responses about premium

efficiency and qualifying motors or explore responses only about premium efficiency motors, assuming that those responses will apply to qualifying motors. For example, in exploring customers' inventory levels, we had to ask and present the results for premium efficiency motors, not qualifying motors because customers were not aware of qualifying motors. We knew that it would be difficult to obtain reliable vendor sales and stocking data, which had to be adjusted or ignored depending on the reliability of data. Finally, as many studies have found, identifying and getting through to the right decisionmaker was a challenge.

While these difficulties were anticipated and were largely overcome, this evaluation has raised more fundamental questions about designing and evaluating market transformation programs. Some of our observations validate the theory(ies) of market transformation while others might require a reexamination of ways in which market transformation programs are designed, implemented and evaluated. We present below the lessons learned, in the format that parallels the most commonly used approach in market transformation, i.e., understanding the markets, selecting approaches to reduce market barriers, establishing market effect indicators and assessing progress toward market transformation. For each of these steps, we summarize PSE&G's design/approach, its effectiveness and possible future directions. We recognize that design and evaluation of a market transformation program will depend on data at hand, especially about markets and program goals. Therefore, future directions or possible solutions could vary widely. Our proposed future directions are intended as a possible way to improve the discipline of market transformation, in general and more specifically for the motors programs.

Understand Markets

Establishing the market baseline requires characterizing a market (market structure, market actors, attitudes of players, etc.), identifying market barriers, estimating the potential impact of market transformation and defining the data required for updating the baseline (Bronfman, 1998). PSE&G's baseline study characterized the motor market very well but this study was probably not required to establish the baseline that a market transformation program would require. While the study was rigorous in estimating market share of premium efficiency motors and price differential among different types of motors, it did not explore attitudes of market players or market barriers, except the availability of motors and technical/performance concerns about premium efficiency motors. As a result, PSE&G relied on secondary sources of information about market barriers. Table 2 summarizes commonly known market barriers in the motor market and our findings.

Table 2. Comparison of Baseline Market Barriers and First Year Results

Market Barriers	Actors Affected	Baseline	First Year Results
Higher first cost		Secondary sources	Important barrier
Awareness of qualifying motors	Customer	Not applicable	Increasing
	Vendor	Not applicable	Increasing
Technical or performance concerns	Customer	Not an issue	Not an issue

Market Barriers	Actors Affected	Baseline	First Year Results
Customer purchase practices	Customer	Not known	Not in favor of premium motors
Motor availability	Vendor stock	Not a barrier	Not a barrier
	Motor models	Not a barrier	Not a barrier
Information on CEE/premium motors	Customers	Not known	Need more education
	Vendors	Not known	Important vendors' staff not knowledgeable on CEE motors

As seen in Table 1, the higher first cost barrier existed as secondary sources suggested. Motor availability and technical concerns were not market barriers according to the baseline study or our findings. No baseline information, however, was available on customer purchase practices or customer knowledge³ of premium or qualifying motors. Our findings indicate that these continue to be important barriers⁴.

Another aspect of market barriers that we believe needs to be addressed is a more rigorous definition of a market barrier. The baseline study and our findings indicated that availability of motors, in terms of vendor stock or percent of motor models offered by manufacturers that conform to the CEE criteria, was not a market barrier. Yet, availability of motors is considered a market barrier in other parts of the US. It is will be helpful to define a market barrier more precisely so that baseline data can be developed and guidance is available on implementation approaches to be used to reduce this market barrier. Some of the questions to be considered for developing a workable definition of the availability market barrier are:

Should we consider product listing in manufacturers' catalogs as an indicator of availability of qualifying motors? If this condition is reached and all manufacturers offer qualifying motors, has the market been transformed? What if these motors are offered but are sitting in manufacturers' warehouses or vendor stock without getting sold? How many manufacturers have to offer complete lines (all ratings, all speeds and all enclosure types) of qualifying motors before an exit strategy is considered? How many distributors and dealers must stock qualifying motors before market transformation is considered successful? What proportion of non-participating customers must cite non-availability of qualifying motors as the most important reason for not purchasing these motors when they needed it?

It appears to us that an appropriate definition for the availability barrier will have to be multi-dimensional depending on the structure of a market being transformed. Defining product availability (supported by baseline indicators) at all levels of the market (manufacturer, distributor, dealer,

³ Customer knowledge means detailed information customers acquire prior to evaluating and making a purchase decision.

⁴ These barriers were known to PSE&G but baseline data that would have helped prioritize barriers were not available.

customer) will allow market transformation practitioners to better target intervention strategies and define market transformation indicators.

Select Approaches to Reduce Market Barriers

A classic approach to identifying market intervention strategies is to leverage the knowledge of market barriers as well as places in the market structure where these barriers should be reduced (Eto, Prahl, Schlegel, 1996). The next step is to design implementation strategies to reduce targeted market barriers. Thus, the cause and effect linkage ensures that implementation efforts lower market barriers. A straightforward cause and effect linkage simplifies the task of developing market effect or market transformation indicators.

PSE&G's intervention strategy acted to reduce some market barriers (higher first cost, awareness) during the first year but practically no efforts were made to reduce other barriers (customer purchase practices, customer knowledge). Market barriers such as motor availability and technical concerns that were proposed to be reduced were not important market barriers.

PSE&G's approach succeeded in creating awareness for the program and qualifying efficiencies; but, during the first year, it did not address important barriers or achieve cause and effect linkages. The assumptions built into its indirect strategy (high program participation generates demand for motors, prompting vendors to stock more motors and manufacturers to offer a more comprehensive line of motors; and vendors perform customer education function to transform customer attitude) were weak. Going forward, the MPP program will need to refocus its attention on important barriers and spend minimal resources to reduce barriers (availability, vendor stocking practices) that do not appear to exist.

Our findings emphasize the importance of an intervention strategy that is implemented in appropriate stages depending on the knowledge of market barriers. For example, it is not important to direct efforts at improving the availability of qualifying motors in PSE&G's service territory until it appears that there is a mismatch between the magnitude of demand for qualifying motors and their availability. A more appropriate sequence of implementation would be to supplement vendor and customer marketing with customer education efforts. Table 3 summarizes the effectiveness of PSE&G's First-Year approach in reducing market barriers and possible future directions.

Table 3. Effectiveness of Approaches Used to Reduce Market Barriers and Future Directions

Market Barriers	First-Year Approach	First-year Effectiveness	Possible Future Directions
Higher first cost	Customer and vendor incentives	25-30% free-riders; Vendors indifferent to incentives	Need customer incentives; vendor incentives dropped
Awareness of qualifying motors	Marketing to customers	Effective in generating awareness but not purchase	Focus on changing purchase practices
	Marketing to vendors	Increased vendor awareness	Recruit more

Market Barriers	First-Year Approach	First-year Effectiveness	Possible Future Directions
		of qualifying efficiencies	vendors
Technical or performance concerns	No efforts to solve technical concerns	Not an issue	Monitor technical concerns
Customer purchase practices	Little marketing to customers; assumed vendors will market	No evidence of vendors marketing to change customer purchase practices	Supplement vendor efforts; marketing to large customers
Information on qualifying/premium motors	Program marketing materials	Raised awareness, did not improve customer or vendor staff knowledge	Need more educational efforts

Establish Market Transformation Indicators

As mentioned before, intervention strategies must be linked directly with the market barriers they attempt to reduce; similarly, market transformation indicators must be linked with the barriers and intervention strategies chosen. PSE&G's program was experimental in some ways - a learning process for everyone involved with the program. As a result, we assessed all market effects normally expected for a market transformation program. It was known that certain market effects might not be noticeable after the first-year but it was worthwhile to assess trends in market effects anyway to enhance the understanding of market transformation process and learn more about markets.

PSE&G quantified only one indicator of program success, i.e., number of motors rebated, whereas, multiple indicators would have been more useful. Multiple quantitative market transformation indicators, made known to everyone involved with program design, implementation and evaluation, help in assessing whether implementation activities are being directed appropriately. These indicators include the final market transformation indicators (milestones at which market intervention is withdrawn) as well as leading indicators (tied to planned implementation activities), which may be time-based if all barriers are being addressed simultaneously or linked with a prioritized order in which market barriers are to be reduced. Some key questions to be asked for establishing market transformation indicators (final or leading) include: Are we measuring the right indicators? Are we measuring too many or too few market indicators? Do the indicators direct performance towards program goals? Is there a cause and effect relationship between outcome measures and the chosen strategy? Are market indicators aligned with the needs of all parties? Are market indicators practically and cost-effectively measurable? Can we establish market indicators to provide performance data on the various stages of implementation?

The First-Year evaluation did not require us to redesign market transformation indicators or scope out the data to be collected periodically. However, in Table 4, we present possible examples of final market transformation indicators and leading indicators for market barriers identified by PSE&G.

Table 4. Selected Market Effect Indicators

Market Barriers	Indicator used in the First-Year	Final Market Transformation Indicators	Leading Indicators
Higher first cost	Incremental cost of qualifying motors	Compared to baseline, declined importance of first cost as a purchase factor and reduction in lost sales due to first cost	Lost sales due to first cost; sales outside program; importance of first cost as a purchase factor
Customer awareness of qualifying motors	Participation rate	Participating customers account for 80% of motor purchases in PSE&G's service territory	customers contacted; # participating
Vendor awareness of qualifying motors	Participation rate	Participating vendors account for 80% of sales in PSE&G's service territory	# of vendors contacted/recruited
Technical concerns	None	Technical/reliability/performance reasons not cited for non-participation; reasonable of evidence of sustained technical improvements	Non-participation due to performance concerns; failures due to technical reasons unique to qualifying motors
Customer purchase practices	None	% of customers specifying qualifying motors; share of qualifying motors in customer purchases	# of decisionmakers identified/contacted; # of purchase practices profiles developed
Qualifying motor availability	Vendor stock	% vendors carrying full line of qualifying motors; qualifying motor share in vendor stock	# of motor vendors identified/contacted/recruited; % vendors carrying full line of qualifying motors; share of qualifying motors in vendor stock.
Qualifying motor availability	Motor models	% share of qualifying models in manufacturers' line; # of major manufacturers carrying full CEE line	% share of qualifying models from catalogs; brands carried by vendors; market share analysis

Concurrent Assessment of Market Transformation

Market transformation programs have a multi-year time horizon over which market structure may change, organizational or administrative barriers may emerge, or competing products may be available, requiring a reassessment and re-adjustment of the intervention strategy and evaluation plans. One such change PSE&G experienced was the opening of program to all vendors instead of a few vendors as originally planned which required resources to be directed at recruiting and servicing

vendors at the expense of direct marketing to large customers. This resulted in a longer start-up time, leaving less time and resources to fully implement the original plan. We evaluated the program in a classic DSM time-frame, i.e., year-end evaluation instead of conducting an on-going assessment that allows assessing the impact of changes and providing feed back for program re-design and implementation.

The evaluation paradigm for market transformation has changed. Instead of asking, “Did we do what we set out to do?”; we must now ask, “Are we doing what we set out to do?”. There is no general guideline available on the right frequency for on-going assessments; perhaps it may not be feasible to prescribe an informally applicable guideline. The Northwest Energy Efficiency Alliance, for example, conducts six-monthly Market Progress Evaluation Reports (Bronfman, 1998). We suggest conducting assessments that are initially tied to major program phases/milestones but are adaptive as market conditions change. Thus, in addition to making program management adaptive to the evaluation findings, we must make the evaluation process adaptive to significant market changes. The need for an on-going dialog between designers, implementers and evaluators has been widely recognized. Under the current structure of program planning, implementation and evaluation, some responsibility for on-going tracking of program performance and corrective action may fall on program implementers, who need to watch the leading indicators and initiate evaluations when needed even if these were required ahead of schedule. The evaluation process should approach the private sector model in which product managers are responsible for designing and monitoring the performance of products.

One Size Does Not Fit All

Most commonly cited measures of long-term market effects are availability of new or competing products, new players, new rules of exchange, changed market structure in favor of energy efficient products and services, increased market share of existing products, changed attitudes toward energy efficient products and lower price differential between standard and energy efficient alternatives (Feldman, 1994). For PSE&G’s program, we assessed if some of these market effects were observable after the first year. From this evaluation and secondary sources, we have gained more understanding of the motor market based on which it appears less certain that all market effects would apply to all energy efficient products and services.

The market effects mentioned above were noticed after the markets for electronic ballasts and T8 lamps were largely transformed (Rosenberg, Rufo, Besa, O’Drain, 1998). There is, however, a major difference in the stage of product/technology life cycle where these products were when market transformation began through utility intervention compared to premium efficiency motors (new versus mature/declining markets). The premium efficiency motor technology is mature but not widely accepted in the market place 20 years since its introduction. It is unclear if increased acceptance of this technology will demonstrate all classic market effects, particularly decreased price differential for adopting more efficient motors and changed market structure. The price of premium and qualifying motors, which use more and expensive materials, does not appear to be substantially influenced by the economies of scale. Utility programs helped in increasing the acceptance of electronic ballasts and T8 lamps by generating a huge rebate-driven demand, and the resulting economies of scale reduced market prices while increasing market share. Manufacturing economics may not allow motor manufacturers to reduce prices of motors in the same manner. If we grant that motor prices may drop somewhat after the

market intervention generates a huge demand, it is unclear if this effect will be measurable given unreliable information on discounts offered by dealers and the differences in available value added packages, which raises a question about the utility of price differential as an indicator of transformation of the motor market.

We also found that motivations of major market players, i.e., motor manufacturers and vendors were not, and are still not well known. For example, manufacturers have offered premium efficiency lines for decades but aggressive push on their part to promote premium efficiency lines appears lacking. We also do not know enough about factors that motivate vendors into stocking a brand of motors or an industrial product. From vendor responses, it appears that brand carrying and stocking decisions are complex and a premium efficiency motor line is just one of the many items sold by most vendors. Is it then possible to influence vendors into carrying a CEE line if customer demand is insufficient or competing products are more profitable?

If we accept that all market effects do not apply to all products, we need modify evaluation approaches that now might have to be less rigorous and comprehensive. Market transformation practitioners have emphasized the need for baseline data, which unquestionably are required. However, overemphasis on the depth and breadth of baseline data and evaluation efforts is not warranted if we directed evaluations to assess the right market transformation indicators that are linked to intervention strategies and market barriers.

Finally, the market transformation programs have emphasized transforming markets, mainly because end-user oriented DSM programs did not transform markets. The results of PSE&G's motors program suggest that customers continue to hold a key place in the market structure and it may be very difficult to transform markets when customer emphasis is reduced. As more evaluation results come in, we will need to continue testing our assumptions, intervention strategies, and evaluation approaches. To this end, PSE&G has made a significant contribution by implementing their pilot program knowing fully well that the art of market transformation was evolving amidst market changes and many unknowns but more needed to be learned about transforming the motor market.

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