
STIMULATING UTILITIES TO PROMOTE ENERGY EFFICIENCY: PROCESS EVALUATION OF THE MADISON GAS AND ELECTRIC COMPETITION

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Abstract

In 1988, the Public Service Commission of Wisconsin (PSCW) authorized the Madison Gas and Electric Company (MGE) to encourage energy efficiency among its customers through the Energy Conservation Competition Pilot (the Competition). The two key objectives of the Competition were to motivate MGE to improve its conservation efforts in terms of both the quantity and cost-effectiveness of conservation achieved, and to provide an opportunity for energy service companies to design and implement innovative and competing programs. The PSCW also approved this program in order to test whether the Competition format was a regulatory strategy that should be used for other Wisconsin utilities for pursuing conservation.

We found the MGE Competition to be an innovative experiment and to have been generally successful in stimulating utility and third-party delivery of DSM services at MGE in the short term, assessing market potential, encouraging innovative DSM program delivery strategies, and providing a measure of utility performance (net benefits). Relative to previous efforts, the Competition produced a huge increase in estimated gas savings, significant increases in estimated electric savings, and a reduced emphasis on estimated peak demand reductions. In general, types of measures installed varied by competitor, but free ridership (15%) did not vary by competitor.

The Competition is one of several approaches that can be used by PUCs to stimulate the provision of energy conservation services. The appropriateness of each option, or the combination of several approaches, will depend to a great extent on a PUC's overall regulatory philosophy and policy objectives, PUC organizational capabilities (e.g., large or small staff) and approach (e.g.,

proactive or mainly reactive), and consideration of a utility's specific circumstances, problems, and preferences.

Background

The Competition was conceived in MGE's 1988-89 rate case. The idea was generated and developed by staff of the PSCW and later adopted with some modifications by the Commission. The main reason why the PSCW staff promoted the idea of the Competition was that they were dissatisfied with the scale and quality of the existing demand-side management programs of MGE. According to PSCW staff, the basic problem was that MGE had good ideas and concepts, but was not implementing many significant programs; therefore, the PSCW staff and the Commission believed MGE needed to be motivated. Thus, as seen by the Commission and PSCW staff, the *primary objective* of the Competition was to compel MGE to install more energy efficiency measures in its service territory. Changes in attitudes and commitment to energy efficiency were not as important to some regulatory staff as the utility's actions and activities that led to reduced customer energy use. Some PSCW staff did hope that the Competition would motivate corporate management to give higher internal priority to its conservation services. In addition, some PSCW staff thought that motivating senior management at MGE would allow MGE's Marketing Department, the group primarily responsible for designing and implementing energy-efficiency programs, to do its job more effectively. Some PSCW staff also hoped that this priority would push the company to win the Competition and to make long-lasting changes within its organization. In summary, the PSCW staff saw the Competition primarily as a psychological incentive, rather than an attractive financial incentive.

The PSCW staff felt the Competition had a number of other important objectives: (1) accelerate the pace of cost-effective conservation implementation; (2) identify additional institutional resources for conservation promotion in the service area; (3) help identify and test innovative conservation delivery or marketing approaches; (4) determine ways to measure utility performance; and (5) test a new regulatory strategy (of competition between a utility and a vendor) in a conservation setting.

During the Competition, MGE offered conservation programs of its own design to three targeted customer sectors: small commercial and industrial (C&I), large C&I, and the residential rental (multifamily) sector. The total budget of these programs was \$950,000 for a one-year period. Simultaneously, three other firms chosen through a competitive bidding process offered their own conservation programs, each targeted to one of the three sectors: Honeywell in the large C&I; A&C, Inc. in the small C&I; and Building Resource Management Corporation (BRMC) in the rental sector. The total budget of these programs was also \$950,000. In each sector, MGE and its competitor competed to provide conservation services in each of the respective customer groups. At the end of the Competition, the competitor achieving the most energy conservation cost-effectively in each sector was to receive a cash incentive (bonus).

The administration of the Competition was overseen by a three-member Panel comprised of one MGE representative, one PSCW representative, and one independent third-party representative. Determination of policy guidelines, resolution of disputes, tracking of results, and other aspects of the Competition were the responsibility of the Panel. In addition, an independent Monitor, selected by the Panel, assisted in determining the performance of each competitor.

Delivery of conservation services under the Competition commenced in November 1988. Competition in the small and large C&I sectors lasted nine months and ended July 1, 1989; the rental competition began on February 1, 1989, and lasted for one year. At the end of the Competition, MGE won in the small C&I and rental sectors, but lost in the large C&I sector.

Process Evaluation

Lawrence Berkeley Laboratory (LBL) was asked by the PSCW and MGE to assess and evaluate four primary objectives of the Competition (Ref. 1): (1) assess if the Competition format is a regulatory strategy worthy of future pursuit; (2) compare the Competition with other

regulatory strategies in promoting conservation; (3) determine how conservation services and/or future such Competitions can be improved; and (4) assess the usefulness of the impact accounting methodology used in the Competition. This paper presents the key findings of the evaluation, with a special emphasis on the first two objectives.

In order to address these objectives, a variety of data sources were used: written materials, in-depth interviews with key project participants and individuals outside of MGE, survey of trade allies (vendors) in the Madison area, survey of customers that participated in the Competition, and a database of measures installed in the Competition. Using these sources, we documented the history of the Competition, described the marketing strategies adopted by MGE and its competitors, customer service and satisfaction, and administrative issues. We also evaluated initial information on program impacts, including estimates of program savings, the distribution and type of installed measures, and estimates of free riders. We examined the impact of the competition on MGE, its competitors, and other Wisconsin utilities. Finally, we compared the Competition concept with other approaches that PUCs have used to motivate utilities to promote energy efficiency and discuss its applicability and transferability to other utilities.

Key Findings

Impact of the Competition on MGE

The Competition influenced MGE to be much more aggressive in developing and implementing conservation service programs to its customers. Structural, procedural, and perceptual changes occurred during the Competition to facilitate the design and implementation of energy-efficiency programs; some of these changes were short-term and some were of a more permanent nature.

Key short-term impacts included the following: a more autonomous Marketing Department with clearer goals and objectives; a faster internal process of program development and approval; conservation programs implemented more quickly in all sectors; and expanded and improved marketing efforts. In addition, MGE's conservation budget doubled for each sector (if one includes funds for competitors), and a greater percentage of these funds went to the C&I sector. To conduct the above activities, a number of organizational changes occurred in the Marketing Department; *e.g.*, more teams were built and work groups (composed of management and field staff) were established for each sector. These organiza-

tional changes led to more verbal exchanges (in contrast to written communication), idea generation, and brainstorming, and increased decision making by a few people within a sector.

It is premature to speculate on long-run effects at MGE because it is unclear whether short-term effects will, or should, become institutionalized in MGE. Nevertheless, some longer-term changes that have occurred as a result of the Competition and that appear to be of a more permanent nature include a more autonomous Marketing Department, more vendors hired, improved program design, and more targeting of measures and mailings. Although both short- and long-term changes might have occurred at MGE naturally over time in the absence of the Competition, many of these changes were accelerated by the program.

Despite the success in making MGE more aggressive in developing and implementing conservation service programs to its customers, the Competition had mixed success in getting the commitment and support of key MGE personnel to promote energy efficiency more than they did before the Competition. Top management and some field representatives were not motivated explicitly and additionally by the Competition. For example, top management felt that, at the time of the Competition, MGE was headed down the same road as the PSCW and that customer service might suffer from outside vendors—a concern that went unrealized. Similarly, some field staff were angry and felt threatened by the Competition and experienced considerable frustration with the rules of the Competition, which they felt would not serve the best interests of their customers and would jeopardize the quality of the service they provided to their customers. In contrast, lower and upper management stated that they were motivated more by professional and organizational pride: they felt they were good workers, had something to prove, and wanted to win, maintain their credibility, and earn the respect of senior management and the PSCW.

Impact of Bonus on MGE

The bonus did not motivate MGE management or staff. Initially, the bonus did get MGE's attention, but once the Competition started running, MGE did not care whether it got the bonus: it only wanted to win, and the bonus became the symbol of being a winner or loser. The bonus was not large enough to influence top MGE management, nor would a larger bonus have made a difference, since the monetary rewards were secondary to the goal of winning. The bonus may have initially provided an incentive to the field staff, since some thought

that the bonus money would be going to them. For others, the uncertainty of how the bonus was going to be distributed made them less motivated and committed. For still others, the bonus never influenced them because they knew that field staff did not get bonuses; they assumed the bonus money would go to management or stockholders. In conclusion, MGE's customer representatives were not stimulated by the bonus.

The bonus also had a negative effect on MGE lower management and customer representatives for the following reasons: they considered themselves professionals and thought the bonus was not necessary for them to do good work and, therefore, they regarded the bonus as demeaning; they thought their other work would suffer if they worked for a bonus in the Competition; and they believed customer service would suffer if they focused only on good prospects for winning the bonus.

Impact of Competition on Other Wisconsin Utilities

The Competition was viewed negatively by several other Wisconsin utilities, as a stick that could potentially be used by the PSCW to encourage energy efficiency programs. From a regulatory perspective, this was a positive impact because MGE's Competition motivated utilities to promote energy efficiency without experiencing the Competition and without incurring additional PSCW staff resources. For example, Wisconsin Power and Light and the Wisconsin Public Service Corporation negotiated a settlement with the PSCW to avoid a program like the Competition. In contrast, Wisconsin Gas decided to run a program similar to the Competition, except that the utility acted as the referee and did not compete with outside vendors. The impact analysis (see below) may indicate other reasons for success in the Competition.

MGE's Organizational Advantages

Participants felt that the winner in each sector won primarily because of its organizational advantages and the effectiveness of its marketing strategy. The conduct of the Competition was considered to be fair by most of the participants. Perceived differences in fairness were mainly attributable to the incumbent advantages MGE possessed as the "home team" in the Madison area. As the local utility, MGE had name recognition, a presence in the marketplace, high credibility, trust, respect, and an excellent reputation for customer service. MGE also had pre-established customer contacts, a customer database, and often knew who to contact in a specific building. Furthermore, MGE had good rapport with trade allies,

who were contracted to market MGE's services. These organizational advantages permitted MGE to have a significant competitive edge over its competitors in the small C&I and rental sectors, and a slight edge in the large C&I sector (Honeywell had the advantage of being a nationally well-known company, credibility, trust, respect, and presence in the Madison marketplace).

Marketing Strategies

In the large C&I sector, a number of participants stated that Honeywell's marketing approach of targeting large customers, using rebates to enhance what it normally did, addressing all of a customer's energy-related needs, providing a full portfolio of services through its turn key service operation, and guaranteeing savings for many of its customers was effective. In the small C&I sector, many participants felt that MGE's marketing strategy of a blitz approach (e.g., giving away setback thermostats, low-flow showerheads, and exit lights) and full portfolio of measures was superior to its competitor. In the rental sector, many participants believed that MGE won because it emphasized low-flow showerheads, offered high rebates, targeted good prospects, and worked well with trade allies.

MGE relied on traditional marketing methods (e.g., advertising, bill inserts, newsletter, presentations, and direct mail), but also used more innovative methods (e.g., working with trade allies and using turnkey services) to win two sectors (the small C&I sector and the rental sector). Honeywell relied on its basic sales approach to convince customers to install energy-efficiency measures; combined with guaranteed savings and bundling of measures, Honeywell won the large C&I sector. Although they did not win their respective sectors, A&C's sales process and use of door-to-door cold calls and BRMC's use of one-stop shopping, bundling of measures, and 25/40% subsidy (where customers received a 40% rebate if all recommended measures were installed, or a 25% rebate if a subset of the recommended measures were installed) were effective in stimulating energy efficiency in the small C&I and rental sectors, respectively.

Rebates

Rebates offered in the Competition were critical in stimulating customers to invest in energy-efficiency measures. In the large C&I sector, rebates drove MGE's program; for Honeywell, while rebates contributed to what it was already doing, none of its projects would have happened during the Competition without the rebates. In the small C&I sector, MGE and A&C thought rebates represented a strong marketing tool and induced activity

that would not otherwise occur. In the rental sector, MGE felt that rebates accelerated the market by at least a couple of years; BRMC also felt rebates were important but decided to reduce the cost of the measure up front (as a subsidy) to the customer, rather than have the customer wait for a rebate after the measure was installed.

Customer Service and Satisfaction

Overall, most customers were very satisfied with the Competition and with the different components of the program. Moreover, the competitors were able to provide similar levels of satisfactory service as provided by MGE. Also, although expected to be a problem, there were few cases of customer confusion as a result of the number of competing vendors operating in the Madison area.

Administering the Competition

The administration of the Competition ran relatively smoothly. The key administrative problems evident in the Competition were related to the Performance Score and the roles of the Panel and Monitor. Many of these problems could be solved or ameliorated in a future Competition if sufficient time were given initially for designing the program (some competitors noted that a future Competition should run longer than MGE's Competition: two years should be sufficient for running the programs, after a minimum period of 4-5 months for designing the Competition).

Many participants felt that the Performance Score (benefits squared divided by costs), used to determine the winners in the Competition, had major flaws and was an inappropriate measure of performance. The Performance Score was not a stable indicator, since it magnified small differences in benefits, so that changes in the latter would lead to significant changes in the score. In addition, "cream-skimming" appeared to be a problem, particularly for measures designed to reduce electricity use. Benefits from long-lived measures were not fully captured in certain sectors. Since the Competition, the PSCW has been using net benefits (benefits minus costs) for measuring utility performance.

The Monitor's role as referee influenced the administration of the Competition. While some of the competitors thought the Monitor did a good job in what was expected of him and was conscientious, several competitors were critical of the Monitor's work. The Monitor was criticized primarily for being too slow (not timely) in preparing the energy-saving calculations, the Competition database, and monthly reports, and in inspecting installations. Despite the guidance given in the Request

for Proposals (RFP) and the Monitor's contract, some competitors felt that the lack of clear directions and priorities given to the Monitor at the beginning of the Competition may have caused many of the Monitor's problems. Similarly, some competitors felt that the Monitor may have received undue criticism, since the Monitor was considered by many as the referee of the Competition, and unhappy competitors wanted to "kill the messenger." Nevertheless, as the Competition progressed, dissatisfaction with the Monitor's work remained a source of contention among several competitors.

The Panel was responsible for administering the Competition and establishing the rules of the Competition. Most participants believed the Panel to be fair to everyone by reasonably accommodating their interests and by making satisfactory decisions. However, several participants thought the Panel suffered the same problem that afflicted the Monitor: the Panel was too slow in making timely decisions on critical issues. The Panel's reluctance to direct the Monitor in the early part of the Competition may have been a reflection of the dual management responsibility that was provided in the Competition: the Monitor and the Panel expected each other to provide the leadership. This reluctance might also have reflected the fact that the PSCW and MGE felt that it would be inappropriate for either of them to lead the Panel.

Initial Information on Program Impacts

Table 1 summarizes the reported electric and gas savings, based on engineering estimates, for MGE and its competitors in each sector. A full-scale impact evaluation, including billing analysis and probabilistic sensitivity analysis of the uncertainty in engineering estimates, was in progress at the time this paper was being prepared and will examine energy savings (estimated vs. actual results), costs, and cost-effectiveness in detail (Ref. 2); in this paper, we offer some initial observations on reported results. First, MGE is a relatively small utility and the results of the Competition should be viewed in the context of the utility's size and previous efforts. In 1988, MGE reported a peak demand of 517 MW and electric sales of about 2190 GWh. In its 1988 Annual Conservation Report, MGE reported estimated savings of 8.2 million kWh and peak demand reductions of 2.8 MW in these three sectors. Reported gas savings were quite small—around 6,460 therms in the rental sector. Relative to efforts in the previous year, the Competition produced a huge increase in estimated gas savings, significant increases in estimated electric savings (13.7 million kWh vs. 8.2 million kWh), and a reduced emphasis on estimated peak demand reductions. This increase was a result of both increased program funding and the more cost-effective use of these funds.

Table 1. Final Results of Competition: Estimated Energy Savings

Sector	kW	kWh on-peak	kWh off-peak	Therms on-peak	Therms off-peak
Large C&I					
• MGE	492	1,975,948	1,849,869	176,600	83,022
• Honeywell	180	1,923,521	2,692,375	196,047	78,153
Small C&I					
• MGE	303	747,235	413,125	400,654	126,350
• A&C	145	365,625	270,854	128,213	23,992
Rental					
• MGE	159	1,221,224	1,813,659	289,994	304,202
• BRMC	51	110,576	326,206	71,962	171,162
Total	1,330	6,344,129	7,366,088	1,263,470	786,881

^aSavings are calculated over the lifetimes of the measures, and peak savings refer to system peak savings.

Second, benefits from measures designed to reduce gas consumption account for about 56% of the total benefits in the first year. We did a simple calculation of the dollar benefits from the estimated savings in which electric and gas savings in the on-peak and off-peak periods were multiplied by MGE's respective avoided cost values. Gas savings are worth about \$735,000 in the first year, while electric savings are valued at \$577,000. Only in the large C&I sector did the dollar value of electric savings exceed gas savings. In our view, the significant gas savings resulting from installation of DSM measures (compared to the dollar value of the electric savings) is somewhat unique for combination utilities. The relative attractiveness of DSM options designed to reduce gas consumption could be related to the avoided costs used to value gas and electric savings (\$0.31-0.38/therm vs. \$0.03/kWh). It is also related to the predominance of gas used for heating and hot water in the market segments targeted by the Competition (particularly the rental market) and in the state in general.

Third, compared to its competitors, MGE appeared to place relatively more emphasis on promoting measures that produced demand reductions and electric savings during the peak period. The ratio of peak to off-peak electric savings is higher for MGE compared to its three competitors (e.g., the ratio for MGE was 1.07 vs. 0.71 for Honeywell). Fourth, Honeywell experienced increases in sales compared to previous efforts in the Madison area. In the large C&I sector, Honeywell estimated that sales increased three-fold (counting the Competition) from normal activities as a result of their participation in the Competition and ability to use the rebates to develop more attractive financial packages for new customers.

Free Riders

Free riders are defined as those participants in a conservation program that would have installed the energy conservation measures even if there had been no program. Because of the emphasis on rebates, MGE and its competitors expected that the number of free riders in this program would be extensive. Also, there was some concern initially that the level of free ridership would significantly differ across competitors. As discussed below, we found the average level of free ridership for all customers to be about 10-15%; however, the number of free riders was higher when measures were analyzed by sectors. The latter type of analysis is important for program designers in order to minimize potential free riders.

In the survey, we asked customers if their decision to install particular measures was influenced by their participation in the Competition program. Because of the

small numbers of customers installing some measures (e.g., cooling, motors, refrigeration, and weatherization measures), the following discussion focuses only on heating, lighting, and water heating measures, options which were installed by a relatively large number of customers.

Two sets of questions were used to probe the extent of free ridership for these measures. For all customers, the first question asked if the customer would have installed the same measure at the same time if the program had not existed. About 85% of the customers among all three sectors indicated that they installed heating and lighting measures because of the program; for water heating measures, the percentage (90%) was even higher. For heating measures, MGE customers in the small C&I and rental sectors were significantly more likely to be free riders than customers targeted by A&C and BRMC: in these sectors, 19% and 39%, respectively, of MGE's customers indicated they would have installed heating measures if the Competition had not existed. And in the large C&I sector, approximately one-third of MGE's and Honeywell's customers indicated they would have installed heating measures if the Competition had not existed. This sector also experienced a high proportion of free riders for lighting and water heating measures, ranging from 25% to 67%. Free ridership was also evident for lighting measures in the rental sector (about 17% for both MGE and its competitor). In summary, for all customers, free riders varied from 10 to 15% for the three end uses examined in this survey; however, free ridership was more extensive when examined by measure and by sector.

Those customers that indicated that they would have installed the measures without the program (i.e., were "free riders"), were asked an additional question to verify if the program had no impact on their decision to install a measure. Ten to 25% of these customers reported that the program did have some impact on their decision. Estimates of "free riders" would decrease for the entire sample to 8 to 13% for the three end uses examined in this survey, if we adjust for responses to this question.

Three additional questions were asked of those customers that indicated they would not have installed a measure without the program. The first question attempted to ascertain if the program had accelerated the purchase of a measure that the customer would have bought at a later date. About 50% of the customers indicated they would have installed the same measure at a later date, which suggests that the Competition accelerated energy-efficiency investment activity. This trend was particularly evident for heating system measures in the large C&I sector (82%). These findings were also confirmed by personal interviews with participants.

The second question asked if customers who had installed more than one measure would have installed fewer measures at the same time if the program had not existed. About 40% of the customers installing multiple measures indicated that they would have installed fewer measures; these results suggest that the Competition stimulated customers to install additional energy-efficiency measures. The third question asked if customers would have installed less efficient equipment if the program had not existed. One-third of the respondents installing heating and lighting equipment would have installed less efficient equipment, indicating that the Competition promoted a market for high-efficiency equipment. Additional information on free riders is contained in Ref. 1.

Other Regulatory Approaches

We briefly compared the Competition with four other alternative regulatory strategies that are being implemented in various states to stimulate utilities to improve their DSM efforts: (1) DSM programs mandated by PUCs; (2) provision of financial incentives to utility shareholders; (3) collaborative planning processes; and (4) DSM bidding. These various approaches are not mutually exclusive, and in many cases are being pursued simultaneously by PUCs and utilities. The advantages and disadvantages of the various options were examined in terms of overall regulatory philosophy, implications for

the roles of utility and third-party providers, as well as specific criteria and objectives used to assess utility DSM programs.

Regulatory Philosophy

Figure 1 describes the five alternative regulatory options to promote DSM in terms of overall regulatory philosophy (type of control mechanism), specific DSM objectives (full realization of DSM potential), and possible implications for the roles of the utility and third-party providers (vendors). It is well understood that PUCs use a combination of "sticks" and "carrots" in regulating utilities (Figure 1, first row). The choice is not strictly between "carrots" and "sticks" but in defining the proper balance and linkages between both types of control mechanisms. In the context of DSM, mandated DSM programs represent the traditional "stick" that PUCs often try first in an attempt to influence utility behavior.

The other four options can be thought of as representing a continuum from "carrots" to "new sticks." Regulatory options that include financial incentives are viewed most positively by utility management, but will often include a penalty for non-performance. On the other hand, collaborative processes represent an attempt to enhance DSM program options outside the traditional regulatory framework. Collaboration involves negotiation among the utility and other interested parties to

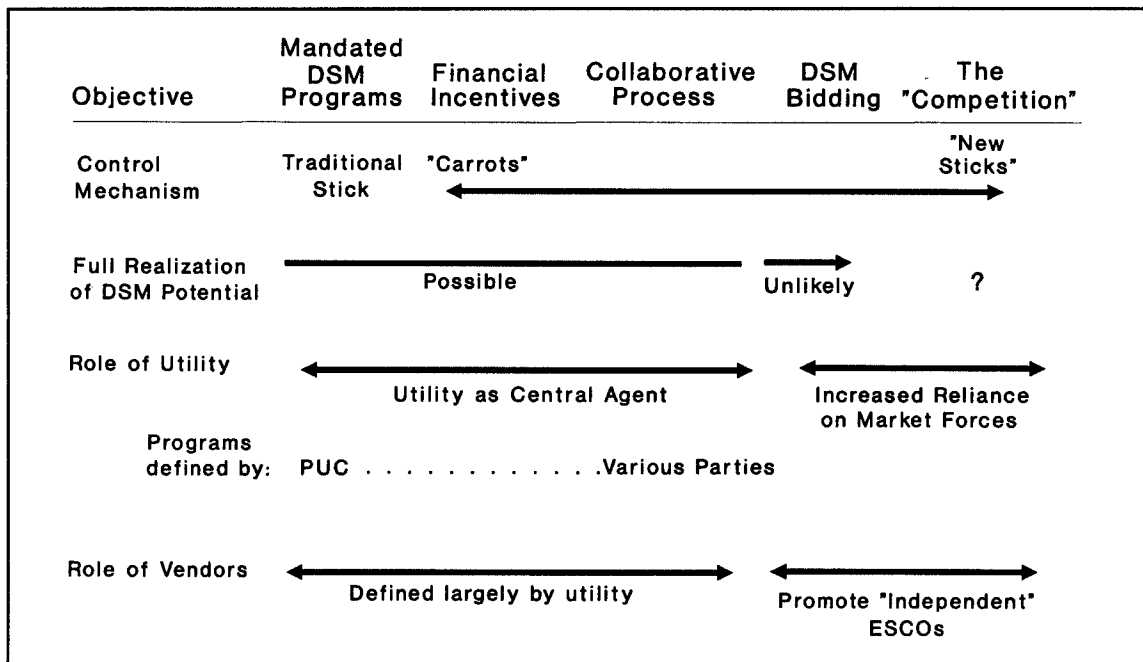


Figure 1. Alternative Regulatory Options to Promote DSM

develop a consensus on an implementation strategy to realize the DSM market potential. Depending on how DSM bidding programs evolved (initiated by utility voluntarily, or as the result of a PUC order), DSM bidding may be viewed either as providing additional service options to customers, or as a potential threat to traditional utility DSM programs. In our model, the "Competition" represents a "new stick" that is available to PUCs.

Realization of DSM Potential

The various regulatory options need to be evaluated against the objective of full realization of the DSM potential (Figure 1, second row). This objective can be interpreted along several dimensions. First, in reviewing a utility's DSM plan, PUCs are often concerned that the plan includes programs that are offered to all customer classes (*i.e.*, programs are "comprehensive"). Second, PUCs will often comment on the utility's attempt to capture the full market potential for DSM in various sectors (*e.g.*, how ambitious and aggressive are the program goals, estimated penetration rates, and savings targets for particular program areas). Current experience with DSM bidding programs suggests that they have a limited role in a utility's overall DSM strategy, and may not be appropriate for all market segments; *e.g.*, it is difficult to imagine DSM bidding programs focusing on new construction. Proponents of the other three options (mandated DSM programs, financial incentives, and collaborative processes) would argue that they offer the possibility of full realization of the DSM potential, albeit by different means. PUCs that mandate DSM programs are often concerned about ensuring that DSM opportunities are available to all customer classes and about capturing full market potential. One of the arguments given for shareholder incentives is to provide the utility with a financial stake in the successful development of DSM resources, to make it financially attractive to aggressively promote energy efficiency in all sectors. Collaborative processes often address these issues by focusing explicitly on minimizing "lost opportunities" and increasing the penetration of comprehensive retrofits.

It is unclear how to evaluate the Competition against this objective of realizing DSM potential. The MGE Competition was a pilot and explicitly limited to three sectors (rental, and small and large C&I). Theoretically, the approach could be expanded to include all types of market sectors and could be "comprehensive" to the extent that there was a pool of third-party providers willing to compete and to provide services to all customers in all sectors. The relevant time horizon is critical in assessing utility efforts to develop the full market potential. While the Competition lasted for 9-12 months,

the other regulatory options are often implemented over longer time periods. For example, winning vendors in DSM bidding typically have 2-3 years to achieve their savings goals, and the program goals and penetration rates of utility DSM programs are typically assessed over the planning period of a short-term action plan or a general rate case cycle (1-3 years). Thus, in addition to stimulating utilities into action, the "Competition" should be viewed as a "blitz" program that can be used by PUCs to assess short-term DSM market potential, not long-term potential.

Role of Utility

Another distinctive feature of these various regulatory options relates to the underlying vision of the role of the utility in the demand-side arena (Figure 1, third row). Approaches that involve mandated DSM programs, financial incentives, and collaborative processes tend to rely more heavily on the utility as the central agent in defining DSM resource opportunities and in implementing DSM programs. The PUC will often issue an order that defines the mandated DSM programs to be implemented by the utility. The end product of collaborative process is a set of utility-sponsored programs that has been defined and developed by the various parties. Note that mandated DSM programs, programs implemented by the utility which are eligible for incentives, and programs that arise out of collaborative processes all can result in significant increases in activity and work for third-party providers because the utility typically will contract for various aspects of DSM implementation. In the "Competition" approach, conservation programs are implemented by third-parties that are relatively independent of utility control or guidance.

Role of Vendor

The alternative regulatory options affect the type of vendors participating in the DSM programs (Figure 1, last row). In mandated DSM programs, programs that use financial incentives, and collaborative processes, utility preferences and needs will tend to define the emerging energy services market. Utilities may choose to rely on trade allies, builders, architectural and engineering firms, and vendors of specific projects (*e.g.*, lighting and HVAC companies) to provide specific services (primarily on a fee-for-service basis). Utilities also may utilize ESCOs to deliver some of their programs. In contrast, DSM bidding and the "Competition" imply an increased reliance on market forces and non-utility entities (ESCOs) to define DSM resource opportunities and to provide comprehensive energy services. In these programs, the ESCO typi-

cally has a more distant (and in some cases adversarial) relationship with the utility and assumes greater performance risks. Most ESCOs are full-service providers in the sense that they offer comprehensive DSM services to customers (initial audits, specification of retrofit packages, financing, project management and installation, and, in some cases, guaranteed savings and continuing operations and maintenance), in contrast to the more specific and narrower range of services typically offered by equipment vendors or contractors.

Applicability of Competition

We found that the Competition, as a "stick," is just one of several approaches that can be used by PUCs. The appropriateness of each option, or the combination of several approaches, will depend to a great extent on a PUC's overall policy objectives, PUC organizational capabilities (e.g., large or small staff) and approach (e.g., proactive or mainly reactive), and consideration of a utility's specific circumstances. Our analysis suggests that the Competition approach may have limited applicability in other states. The ability to transfer this approach may be limited by a number of factors, including the reluctance by energy service firms to compete directly against well-established utilities in Competitions, given that other opportunities may be more attractive and less risky for energy service firms in the current business environment. For example, utility-sponsored programs are expanding rapidly in several regions, and utilities are contracting out much of this work to third-party providers. Moreover, ESCOs may be more interested in the long-term contracts that are offered through DSM bidding programs and the prospects of a less adversarial relationship with the utility. In fact, the initial response by ESCOs to the request for proposals in the rental sector illustrates this problem.

The feasibility of the MGE Competition was improved because of a unique combination of factors, including Wisconsin's mature and sophisticated least-cost planning process, the long-term working relationships established between the PSCW and utility staff as a result of Wisconsin's least-cost planning process, the geographic proximity of the utility and PSCW staff, and the distinctive characteristics of MGE and its customers. For example, MGE is a small organization with a small, compact urban service area, has an innovative marketing department, and its customers are highly educated, liberal, socially responsive, and aware of environmental and energy-related issues.

Finally, a Competition-type approach similar to the MGE pilot involves a significant commitment of PUC

staff resources. Other alternative regulatory approaches also involve additional responsibilities and work for PUCs. However Competition-type approaches involve PUC staff in different types of decision-making roles (through membership on a Panel) and may require more direct and sustained involvement in the implementation details of DSM programs. Some PUCs may not be that anxious to assume these new roles, given limited resources, particularly if they are involved in one or more of the other approaches described previously.

Conclusions

We found the MGE Competition to be an innovative experiment and to have been generally successful in stimulating utility and third-party delivery of DSM services at MGE in the short term, assessing market potential, encouraging innovative DSM program delivery strategies, and providing a measure of utility performance (net benefits). For example, the Competition did demonstrate the amount of energy conservation that could be achieved in certain sectors over a specified time period (9-12 months) to the PSCW, MGE, and other utilities; and the results of the Competition will be used by the PSCW as a yardstick for measuring and comparing the performance of utilities in Wisconsin: the PSCW will use net benefits (benefits minus costs) as the measure of performance.

Our evaluation suggests that there was a significant divergence of opinion about the relative merits of this approach among key participants. The PSCW staff viewed the experiment as highly successful in terms of motivating MGE and other Wisconsin utilities to increase conservation services; MGE staff were not enthusiastic about the basic approach, while other utilities reacted negatively. Despite the Competition's problems and limitations, the program clearly stimulated MGE to develop a broader menu of conservation services for its customers and to implement these programs more aggressively. However, the Competition is one of several approaches that can be used by PUCs to stimulate the provision of energy conservation services. The appropriateness of each option, or the combination of several approaches, will depend to a great extent on a PUC's overall regulatory philosophy and policy objectives, PUC organizational capabilities (e.g., large or small staff) and approach (e.g., proactive or mainly reactive), and consideration of a utility's specific circumstances, problems, and preferences.

Acknowledgments

This work was supported by the Madison Gas and Electric Company on Contract No. BG90-005 through the U.S. Department of Energy under Contract No. DE-AC03-76SF00098, and by the Assistant Secretary for Conservation and Renewable Energy, Office of Utility Technologies of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098. This work benefitted greatly from input and assistance from Lynn Hobbie of MGE.

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