Madison Gas & Electric
Residential Lighting Program
Profile #93

LIBRARY
WASHINGTON STATE ENERGY OFFICE
9[illegible] ST. SE, BLDG. 4
PO BOX 43169
OLYMPIA WA 98504-3169

Executive Summary

Madison Gas and Electric is a small investor-owned utility that sells both electricity and gas in Wisconsin. Despite its size, Madison Gas and Electric (MGE) has been a pioneer in demand-side management. In fact, a 1991 DOE study found MGE to be one of nine leading utilities nationally in the delivery of rebate programs.

The Residential Lighting program provides a snapshot of the utility's DSM philosophy. The program has evolved substantially over a number of years, with lessons learned at each juncture used to refine it and hone its success. The program in its current form is now being phased out as its mission is fulfilled. The utility was successful at significantly increasing the availability and acceptance of CFLs in the residential market. MGE now hopes to use customer education and cooperative efforts with retailers and manufacturers to sustain and increase this market share.

Before the Residential Lighting program began, MGE's customers primarily purchased incandescent lightbulbs due to a lack of awareness and availability of alternatives. MGE aimed to create a program which would help turn the retail marketplace into a reliable, permanent source for high-efficiency products; educate and motivate customers to continue to buy high-efficiency lighting products; achieve maximum customer and utility energy savings at the least cost; and support rather than compete with lighting business allies. The program succeeded in fulfilling the transformation of the retailers in the service territory. For instance, in 1990 there were only four retailers in the MGE service territory selling six models of CFLs. Currently there are 62 retailers (out of 100 retailers) selling a total of 63 models of CFLs.

Working with retailers and manufacturers has been one of the most important ingredients of the program's success. While coupons were distributed directly to customers, later in the program these coupons were provided through stores as well. MGE also offers to pay 50% of cooperative advertising for retailers keen on promoting energy-efficient lighting technologies. Retailers who agreed to handle in-store coupon distribution have been highlighted in several newspaper ads, and lists of vendors stocking CFLs were provided to customers. MGE staff have also met with retailers and manufacturers to promote the program and provided point of purchase displays for shelves and counters. MGE has regularly followed-up with retailers to maintain their awareness and thorough understanding of program details and to ensure that they carry a sufficient stock of lamps and fixtures.

While the program initially sputtered, MGE management was confident in the program's basic design and thrust. Over time the program's impact grew dramatically and in recent program years the goals have been exceeded by factors of two, three, and four! Then in 1994 because of the program's positive impact on the marketplace MGE elected to begin phasing out monetary incentives and focus more on customer education and other means to enhance CFL distribution, purchase, and use.

MADISON GAS & ELECTRIC
Residential Lighting Program

Sector: *Residential*

Measures: *1993-94 measures include electronically and magnetically ballasted CFLs, compact fluorescent indoor and outdoor fixtures, and high pressure sodium fixtures*

Mechanism: *In 1993-94, customers could redeem coupons for $5 or $10 for eligible lighting measures. Rebate amounts of $15 or $30 for other measures*

History: *Began in 1990. Presently program emphasis is being shifted from monetary incentives towards market support and maintenance activities*

1993-94 PROGRAM DATA

Energy savings:	*8,782 MWh*
Lifecycle energy savings:	*43,910 MWh*
Capacity savings:	*422 kW*
Cost:	*$863,300*

CUMULATIVE DATA (1990-91 - 1993-94)

Energy savings:	*23,799 MWh*
Lifecycle energy savings:	*78,765 MWh*
Capacity savings:	*738 kW*
Cost:	*$1,496,100*

CONVENTIONS

For the entire 1994 profile series all dollar values have been adjusted to 1990 U.S. dollar levels unless otherwise specified. Inflation and exchange rates were derived from the U.S. Department of Labor's Consumer Price Index and the U.S. Federal Reserve's foreign exchange rates.

The Results Center uses three conventions for presenting program savings. ANNUAL SAVINGS refer to the annualized value of increments of energy and capacity installed in a given year, or what might be best described as the first full-year effect of the measures installed in a given year. CUMULATIVE SAVINGS represent the savings in a given year for all measures installed to date. LIFECYCLE SAVINGS are calculated by multiplying the annual savings by the assumed average measure lifetime. CAUTION: cumulative and lifecycle savings are theoretical values that usually represent only the technical measure lifetimes and are not adjusted for attrition unless specifically stated.

© The Results Center

Madison Gas and Electric Company (MGE) is an investor-owned utility located in Madison, Wisconsin. In terms of financial strength and stability, MGE has consistently been ranked as one of the top investor-owned utilities in the country. The utility generates, transmits, and distributes electricity to more than 117,000 customers in a 250 square mile area in Dane County. Dane County has a total population of 367,000 and is the fastest growing county in the state in terms of population. MGE's service territory within Dane County has a total population of 250,000. MGE also transports and distributes natural gas to more than 97,000 customers in 975 square miles of its service territory in Columbia, Dane, Iowa, Juneau, Monroe, Vernon, and Crawford counties. MGE's gas and electric service territories encompass Madison, which is the state's capital as well as home to the University of Wisconsin and many high-tech companies. In a 1993 Money magazine survey, Madison was rated the second most liveable city in the country. [R#1,2]

MGE's electric revenues increased 3% in 1993 over 1992, up to $132.7 million, largely due to a warmer summer and a growing customer base. Hot weather and increased use of air conditioning drove electric peak demand to a system record 541 MW on August 26, 1993. While Wisconsin is known for its harsh winters, MGE's electric peak occurs in the summer because most customers heat with gas and the utility's air conditioning load has been increasing substantially in the last decade. Approximately 40% of summer peak load is made up of air conditioning, most of which is used in the residential sector. MGE had a total of 630 cooling degree days in 1993, compared to the historical average of 597, and had 7,351 heating degree days, compared to its norm of 7,455. [R#1]

MGE had total electric sales of 2,442 GWh in 1993 including 667 GWh to residential customers, 1,406 GWh to commercial customers, 173 GWh to industrial customers, 177 GWh for street lighting, and 19 GWh to "miscellaneous" customers. While MGE ended the year with 117,043 electric customers, the utility averaged 115,891 customers for the year. These customers consisted of 100,721 residential, 15,037 commercial, 77 industrial, 53 street lighting and public authorities, and three other utilities. [R#1]

In terms of energy sources generated and purchased, MGE's fuel mix was as follows: coal 47.1%, nuclear 26.6%, purchased power 23.1%, and gas 3.2%. The utility had a total 1993 generating capacity of 608 MW and peak demand of 541 MW creating a reserve margin of 12%. MGE generating facilities include a 17.8% share of the Kewaunee Nuclear Power Plant, 22% ownership of the coal-burning Columbia Generating Facility, the Blount Generating Station which uses gas, coal and renewables, and five combustion turbines in the Madison area. MGE has no plans for additional power plants prior to the year 2000. [R#1]

MGE 1993 ELECTRIC STATISTICS

Number of Customers	117,043
Number of Employees	721
Electric Energy Sales	2,442 GWh
Electric Energy Sales Revenues	$132.67 million
Peak Demand	541 MW
Generating Capacity	608 MW
Reserve Margin	12%
Average Electric Rates	
Residential	6.98 ¢/kWh
Commercial	5.00 ¢/kWh
Industrial	4.16 ¢/kWh

In 1993, MGE increased its holdings by adding new divisions and subsidiaries including two new divisions providing natural gas service in Elroy and Viroqua, Wisconsin. Great Lakes Energy Corporation is a wholly-owned subsidiary which markets excess gas supplies and pipeline capacity to commercial and industrial customers in the Upper Midwest, making MGE one of the first utilities in the country to offer comprehensive energy services outside its territory. MGE also owns 50% of Superior Lamp Recycling Inc., the state's first facility to recycle fluorescent lamps. [R#1] ■

© The Results Center

Utility DSM Overview

MGE 93 - 94 DSM PROGRAMS

Agricultural

Power Plus for Agriculture

Commercial / Industrial

Large C/I Conservation Service

Small C/I Conservation Service

Large C/I New Construction Conservation Service

Small C/I New Construction Service

Rental

Energy Rating Service

Conservation Service

New Construction Conservation Service

Residential

Energy Efficiency Service

Gas / Electric Conservation Checkup

Appliance Efficiency

HVAC Efficiency

High-Efficiency Lighting

High-Efficiency Water Heaters

Home Weatherization Package Rebate

New Home Services

Low Income Weatherization Assistance

General

Custom Gas & Electric Rebates

Direct Load Control

Electric - to - Gas Fuel Switch

Financing

Information

Leasing

Rates

Shared Savings

Training Programs

Madison Gas & Electric has been implementing DSM programs since 1987 under the Power Plus umbrella. In 1986, the Wisconsin Public Service Commission ordered the large investor-owned electric utilities in the state to use a "least-cost integrated planning process" in order to create what are referred to as "advance plans," essentially the nation's first integrated resource plans. As a result of this process, Wisconsin is considered one of the nation's leaders in least-cost planning and its utilities have been at the forefront of both program design and implementation. [R#2,14]

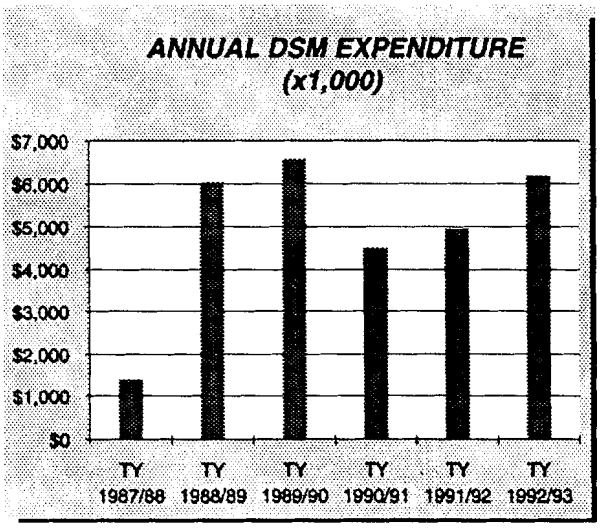
MGE tracks its DSM programs in "test years" (TY) which run from June 1 through May 31 and which are thus presented accordingly. (For instance TY 1992/93 runs from June 1, 1992 through May 31, 1993.) Figures in this section reflect both gas and electric costs and savings. Costs include rebates plus all administrative costs and have been levelized based on the earlier year of each test year, i.e. test year 1991-92 has been levelized using the conversion factor for 1991 per The Results Center convention. Starting in January 1995, MGE will track all programs on a calendar year basis, although the title "test year" will still be employed.

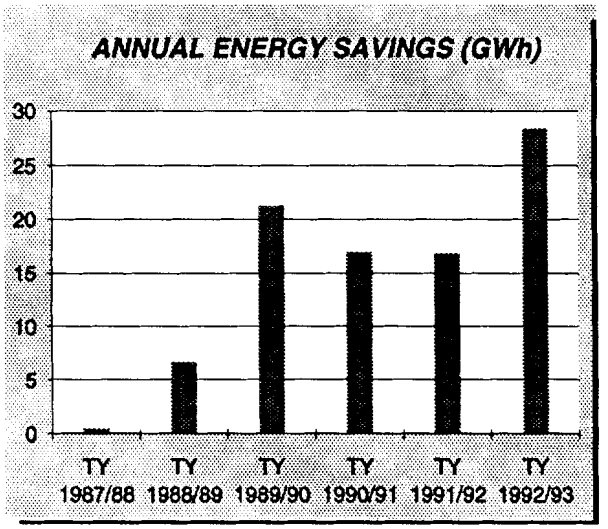
The utility's roster of DSM programs has achieved total annual energy savings of 90 GWh, annual summer coincident peak capacity savings of 36 MW, and annual gas savings of 8 million therms through May 1993. During test year 1992/93, MGE's DSM programs accounted for 28 GWh of energy savings, 13 MW of peak capacity savings, and 1.6 million therms of gas savings. The utility spent a total of $6,191,000 on its DSM programs in 1992/93 (equal to 4.7% of 1993 gross electric revenues) and plans to meet 22% of estimated total base demand through its DSM programs by the year 2000. [R#2,3,4,16]

MGE offers similar DSM services to all of its customer classes (see accompanying table). Historically, MGE has offered comprehensive rebates and loans to agricultural, commercial and industrial, residential customers, and rental property owners. In fact, a study sponsored by U.S. Department of Energy in 1991 identified MGE as one of nine U.S. utilities considered leaders for their delivery of rebate programs. The study examined more than 100 gas and electric companies nationwide. MGE

© The Results Center

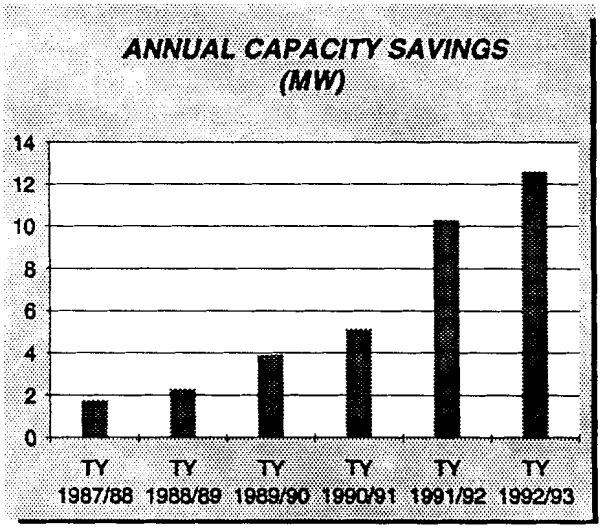
DSM OVERVIEW	ANNUAL DSM EXPENDITURE (x1000)	ANNUAL ENERGY SAVINGS (GWh)	ANNUAL COINCIDENT PEAK CAPACITY SAVINGS (MW)	ANNUAL GAS SAVINGS (therms)
TY 1987/88	$1,397	0.4	1.74	0
TY 1988/89	$6,035	6.6	2.28	1,432,339
TY 1989/90	$6,577	21.2	3.87	2,434,557
TY 1990/91	$4,514	16.9	5.12	1,570,576
TY 1991/92	$4,933	16.8	10.27	1,240,043
TY 1992/93	$6,191	28.4	12.57	1,590,264
Total	$29,646	90.2	35.84	8,267,779





also had the added distinction of being the smallest of the nine utilities classified among the leaders.

Measures typically eligible for rebates and loans under MGE's programs include various types of lighting, HVAC, weatherization, motors, refrigeration equipment, and fuel switching. A wide range of custom rebates for specialized efficiency measures are also available. Looking towards the future and in line with national DSM trends, MGE plans on reducing the rebates it offers throughout its DSM roster. The utility is confident that it can do so without compromising its DSM goals given evidence of increased customer awareness, acceptance of energy efficiency, and transformation of markets in the Madison area. [R#2,13] ■



PROGRAM OVERVIEW

MGE first offered its Residential Lighting program (also known as the High-Efficiency Lighting program) in 1990. The program uses a two-pronged strategy. Customers presenting coupons at participating retail stores can purchase products at discounted prices. With mail-in rebates the customer sends in his or her dated product receipt along with a rebate application to the utility and later receives a rebate in the mail. While the program has promoted a range of efficient lighting products, in recent years the major emphasis has been on compact fluorescent lamps (CFLs) and fixtures. Presently the program is being transformed from an emphasis on direct customer subsidies to new strategies which focus on sustaining the market through customer education and cooperative efforts with retailers and manufacturers. [R#2]

While MGE tracks its DSM program activity on a test year (June through May) basis, the Residential Lighting program has generally been implemented on a different time table starting with September of each year. Nonetheless, Residential Lighting program savings and participation are reported on a test year basis. Virtually all program activity occurs during October and November which falls during the given June through May "test year."

Before the Residential Lighting program began, MGE's customers primarily purchased incandescent lightbulbs due to a lack of awareness of alternatives as well as the limited availability of these alternatives. MGE aimed to create a program which would help turn the retail marketplace into a reliable, permanent source for high-efficiency products; educate and motivate customers to continue to buy high-efficiency lighting products; achieve maximum customer and utility energy savings at the least cost; and support rather than compete with lighting business allies. Another primary motivator for the program was that the Wisconsin Public Service Commission (PSC) staff strongly suggested a program promoting home lighting efficiency. [R#2,7]

MARKETING

Program promotion has consisted of aggressive advertising and business ally outreach aimed at long-term development of the retail sales and distribution infrastructure. MGE also produces informational brochures on CFLs to be sent to customers and supplies retailers with in-store informational materials. MGE works closely with retailers and manufacturers to ensure product availability and point-of-purchase promotions to encourage sale pricing. Other marketing includes television, radio, and newspaper advertising in conjunction with cooperative funding of manufacturer and retailer ads and promotions. MGE has also run frequent articles on the lighting program in its customer newsletter. [R#2]

DELIVERY

A three-month pilot program began in March 1990 and targeted the community of Middleton within the MGE service area. Coupons for nine technologies and an application for six rebated technologies were mailed to Middleton customers. These coupon books were individually coded and tracked. Retailers were reimbursed once they mailed in the coupons to an MGE contracted coupon clearinghouse. Program participation was minimal, with no redemption activity for several of the rebated technologies. Many customers reported they could not find the eligible technologies in retail outlets. Nonetheless, the utility felt the program design was sound and the decision was made to implement a full-scale program. This decision was based on several factors. Feedback from business allies was positive and a post-pilot survey indicated that customers were interested in efficient lighting products. The MGE program team felt that success would not happen instantaneously and therefore offering the program on a full-scale basis for an entire year would give the program a chance to grow. [R#2]

YEAR ONE 1990-91

In September of 1990 a full-scale program was launched. MGE's general strategy was to provide coupons for lower-priced products and rebates for the higher-priced lighting technologies. Coupons which could be redeemed at the point of purchase were issued for nine technologies. These coupons were mailed to customers upon their request. Customers had been notified of the program through bill inserts. Couponed technologies included energy-efficient incandescent bulbs, halogen incandescent bulbs, energy-efficient (PAR) incandescent bulbs, halogen (PAR) incandescent bulbs, energy-efficient reflector incandescent bulbs, energy-efficient two- and three-way incandescent bulbs, elliptical reflector incandescent bulbs, energy-efficient compact/circular fluorescent bulbs, and high-efficiency 4-foot rapid start fluorescent tubes. The fluorescent bulbs had the highest coupon value at $5 per bulb with the other technologies

© The Results Center

ranging from $0.10 to $1.50. Mail-in rebates of $30 were offered for high pressure sodium (HPS) and $40 for metal halide fixtures. Incentive levels were based on estimated product incremental costs and utility benefits. Both the coupons and rebates were available from September 1990 through August 1991. [R#2]

When the full-scale program began in 1990 it was marketed through a bill stuffer customer newsletter and television, newspaper, and radio advertising. Cooperative advertising where MGE covered 50% of the cost was offered to participating retailers. Staff also met with larger retailers and manufacturers to promote the program and provided point of purchase displays for shelves and counters. [R#2]

Coupons were numbered and their distribution was tightly restricted. These precautions were expensive but initially thought necessary because of uncertainty regarding the potential for fraud and non-customer redemption given such large coupon amounts. Initial interest in the program was high with 15,000 customers requesting coupon booklets in response to the newsletter promotion. Actual bulb purchases, however, were far below projections with just 1,295 coupons redeemed. A total of 148 HPS fixtures were installed for rebates and no metal halide fixtures were purchased. The largest single supplier of lighting products for the program was MGE's Energy Center. More than 50% of the redeemed coupons came from Energy Center sales as very few retailers were carrying the eligible products. The Energy Center was created to provide customers with high-efficiency products not readily available in the marketplace. [R#2]

Due to first year results of the program there was pressure from the state regulatory commission to change the program to a direct sales approach. In June 1991, a customer focus group was held to gain feedback on the program. The results of the focus group reinforced the basic program concept, and caused MGE to increase program promotion, expand the coupon book, and provide customers with a list of retailers carrying eligible products. With these changes PSC endorsed the program for a second year despite participation concerns. [R#2]

YEAR TWO 1991-92

Program modifications helped increase participation in 1991. The mix of eligible measures was changed as incandescents were dropped due to their marginal efficiency improvement and the program's emphasis was placed on compact fluorescent lamps. Rebates were $30 or $40 for high pressure sodium fixtures and metal halide fixtures depending upon the wattage. Both the coupon and rebate components ran from October 1991 through August 1992.

Coupon distribution initially relied on a bill insert newsletter announcement which triggered customer requests for coupons. In the summer of 1992 a new distribution strategy was tested with three compact fluorescent bulb coupons worth $6 each inserted into customer bills. The increased response was marked. MGE also experimented on a small scale with having coupons available at the service counters of stores inside MGE's service area. Previously, availability of coupons was limited for fear of redemption by non-utility customers. MGE also abandoned coupon numbering due to the high cost.

The program's acceptance among business allies also increased with more stores carrying eligible lighting products. As a result MGE's Energy Center handled a smaller percentage of qualifying products and in fact this retail outlet was phased out in December 1992. Nonetheless, participation still fell short of projections with coupon sales totaling 4,664 and the number of fixtures rebated equaling 379. [R#2]

Pressure to achieve greater impacts increased from the Wisconsin Public Service Commission. For further insights MGE looked at similar programs conducted by other utilities and held another customer focus group. In particular MGE studied the residential Operation Lightswitch lighting program implemented by Central Maine Power (See The Results Center Profile #19). Based on lessons learned there, MGE realized the importance of using a shorter and more intensive program period; making coupons readily available in retail stores; increased advertising; improving contact with manufacturers to guarantee product availability and promotional support; and constant follow up with retailers to maintain their awareness and thorough understanding of program details and to ensure that they carry a sufficient stock of lamps and/or fixtures. [R#2]

YEAR THREE 1992-93

The reworked program began on September 1, 1992. Indoor compact fluorescents (but no others) were couponed. Coupon pricing was adjusted to achieve ☞

greater penetration per household with $6 for 1 CFL and $14 for 2 CFLs. The new distribution strategy (a direct coupon inserted into customer bills) piloted during the final months of Year Two was expanded. Most importantly coupons were made available in many more stores. In order to control against non-customer redemption, participating customers had to provide their name and address on the back of coupons. Retailers were asked to check this information and make sure the customer lived within MGE's service territory. Random checks of redeemed coupons by MGE were used to verify that redemption by non-customers was not a concern. A few retailers located just outside MGE's service territory continued to participate as the new controls were considered sufficient to avert substantial non-customer redemption. In addition MGE's neighboring utility, Wisconsin Power & Light, had a direct sales residential lighting program reducing the likelihood of those customers participating in MGE's program. Cooperative advertising was made even more attractive to participating retailers through advertisement design assistance, and retailers received training from MGE staff on lighting technologies. Retailers who agreed to handle in-store coupon distribution were highlighted in several newspaper ads. [R#2]

Coupons could be redeemed from September 1 through December 31, 1992. There were several reasons for a shorter time frame for coupons. MGE felt that advertising efforts concentrated on a limited period would have a much greater effect than advertising spread throughout the year. Customers faced with a limited program time frame would be more motivated to participate and less likely to procrastinate than if the program were offered year round. Retailers also liked the limited coupon period because they could focus their stocking and display efforts for a brief time. Several stores ran sales featuring discounted bulb prices in combination with on-site coupons.

Advertising strategy in general and for television ads in particular shifted. Previous TV promotion focused on dollar incentives for a range of technologies. The 1992-93 ads emphasized customer and social benefits, such as personal and environmental savings of CFLs. [R#2]

Following the many program revisions the number of couponed bulbs sold jumped dramatically to 59,019, or three times the goal for the year.

The rebate component ran from September 1, 1992 through August 31, 1993. Eligible measures were again revised. Metal halide fixtures were dropped because of continuing availability problems. Indoor and exterior fluorescent fixtures were added to the rebate portfolio at $15 each joining high pressure sodium fixtures at $30 or $40. [R#2]

YEAR FOUR 1993-94

In the program's fourth year MGE elected to provide coupons for a five-month period from September 1, 1993 through January 1994. This extension of the coupon period from the previous year was in response to retailer feedback. The rebate component of the program runs from February 1, 1994 through January 31, 1995. Couponed technologies consisted of electronically-ballasted compact fluorescent bulbs ($10) and magnetically-ballasted CFLs ($5). Rebated technologies consist of compact fluorescent indoor fixtures ($15), compact fluorescent outdoor photo-eye fixtures ($15), and high pressure sodium fixtures ($30). Electronically-ballasted CFLs were given a higher incentive in order to stimulate sales. The purpose of the higher incentive was to improve customer satisfaction by promoting instant-on bulbs which did not flicker. Customers had expressed concern over slow start-up time and flickering with other technologies. A listing on the $10 coupons specified which bulbs qualified in order to help customers and retailers distinguish them from the $5 off bulbs. Coupons for instant discounts on CFLs were distributed through direct mail and through retail customer service areas with 53 out of a possible 100 lighting retailers requesting coupons for distribution. Customers had to provide their name and address on the coupons which helped program tracking. Rebate forms for compact fluorescent and high-pressure sodium fixtures are available at retail locations and through lighting installers. [R#2]

In September 1993, MGE trained 120 retail store employees regarding CFLs and the coupon program. MGE staff visited all of the stores at least twice to check displays, products, and replenish coupon supplies. This intensive interaction with retailers took place because MGE realized that reaching customers effectively at the point of purchase was a key to the program. MGE also made coupons available through the Energy Federation, Inc. mail

© The Results Center

order service so that customers such as the elderly who had trouble getting to the store could easily participate. In addition, program staff worked with retailers and manufacturers to ensure there was a sufficient supply of measures to meet customer demand. [R#2]

Several manufacturers offered concurrent rebates or special promotions during the program. Aggressive competition among many of the lighting retailers resulted. Manufacturer rebates and special offers maintained prices in stores at $5 to $10 per bulb, even after MGE coupons expired. GE and Sylvania were the major manufacturers offering incentives which ranged from $3 to $5 per lamp. Approximately 25% to 30% of participating customers used these manufacturer incentives. Other manufacturers also offered some type of special pricing along with displays and in-store videos for retailers. [R#2,5]

By November 1993, approximately 400,000 coupons had been issued to stores and customers. Coupon redemption was 85,000, more than double the goal for the year. However program funds were exhausted and some retailer supplies were running low. MGE decided not to print and distribute more coupons, despite some untapped customer and retailer demand. MGE staff members carefully monitored the results. [R#2]

There was evidence that a significant number of stores sold and customers purchased compact fluorescents without MGE coupons both before and after program's end. Several factors accounted for this free drivership. Other retailer and manufacturer incentives were in place, and customers were more motivated and needed less of a total dollar incentive to purchase compact fluorescents than in the past. This trend reinforced MGE's assessment that it was possible and indeed time to evolve the program from reliance on MGE incentives to emphasis on other market support strategies. [R#2]

Many customers paid less than $5 for each bulb purchased in 1993-94, when MGE, manufacturer, and retailer incentives/discounts were combined. In certain instances customers were procuring compact fluorescent lamps for free. MGE had some concern that customers would have unrealistic price expectations for CFLs in the future. Some customers were buying many more lighting measures than they currently needed in an attempt to take advantage of the combined utility and manufacturer incentives. On balance, however, this situation had some neutral or even positive effects on program goals. MGE believes that customers who purchased many bulbs at once will use the extra bulbs as replacements, ensuring long term savings. In addition, having such attractive incentives helped bulb sales take off and gained additional support for the program from retailers and manufacturers. [R#2]

CURRENT STATUS/RECENT DEVELOPMENT

MGE believes that the compact fluorescent lamp marketplace has evolved significantly in terms of the retailer infrastructure. The accompanying table reflects the changes that have taken place from a retail perspective since the program began. In 1990, there were only four retailers in the MGE service territory selling six models of CFLs. Currently there are 62 retailers (out of 100 retailers) selling a total of 63 models of CFLs. In addition, fixture sales have doubled every year, a direction MGE believes is critical to capturing long-lasting energy impacts.

RETAILER INFRASTRUCTURE TRANSFORMATION INDICATORS (100 Total Retailers)	1990	1994
# Selling CFLs	4	62
# CFL Brands Sold	3	12
# CFL Models Sold	6	63
# Redeeming CFL Coupons	3	53

Because of all these changes to the marketplace the utility decided in March 1994 to evolve its residential high-efficiency lighting strategies in other directions. MGE now plans to reduce reliance on direct subsidies and to instead emphasize market support and maintenance activities such as customer education and retailer training. The utility also plans to work closely with manufacturers to help them with distribution channels and sales goals. Program promotion will continue to include co-op advertising. In terms of technologies, MGE will continue to promote the more permanent products with long-lasting impacts such as fixtures. [R#2,7] ☞

© The Results Center

Since early 1994 the Wisconsin Residential Statewide Lighting Roundtable Group has been attempting to get all utilities in the State of Wisconsin to participate in a residential/small commercial lighting program scheduled to begin implementation in the fall of 1994. The Roundtable Group has been meeting on a regular basis since 1992. In early 1994, the Roundtable Group seriously considered the use of a manufacturers' rebate incentive in which the utilities buy down the price of the product from the manufacturer with the savings passed on to the consumer. The manufacturer's rebate concept was abandoned in the summer of 1994 due to potential legal, technical, and evaluation difficulties. Several of the larger Wisconsin utilities plan to use another form of customer incentive for compact fluorescents in the coming year. MGE will follow different strategies than the other utilities given its well developed market for compact fluorescents. [R#2]

MEASURES INSTALLED

Promoted technologies have changed as the program has matured and evolved over its five-year history. Measures included in the 1993-94 program are electronically-ballasted CFLs, magnetically-ballasted CFLs, compact fluorescent indoor fixtures, compact fluorescent outdoor photo-eye fixtures, and high pressure sodium fixtures.

STAFFING REQUIREMENTS

Ruth Miller is the Residential Lighting program administrator and devotes 80% of her time during the months of July through October to the program, and 25% of her time from November through June. This shift is due to the heavy coupon and advertising activity in the fall of each year. The administrator is responsible for program design, impact reports, business ally contacts, budgeting, public presentations, and representing MGE on the Statewide Lighting Roundtable. [R#2]

Bob Stoffs, Senior Marketing Representative, devotes 5% of his time to the program including program design and acting as a liaison with Wisconsin Public Service Commission. He has also coordinated sales of CFLs and fixtures at neighborhood workshops. JoAnn Kelley is the Manager of Residential and Multi-Family Marketing and spends 1% of her time overseeing program activities and visiting participating retailers. Terry Manley is a Senior Communications Coordinator who spends 5% of his time on program promotional literature and advertising. [R#2]

Other staff members involved with the program include a dozen residential marketing staff members who promote the Residential Lighting program within the context of MGE's overall DSM roster. Customer Service Representatives (equal to 0.2 FTE) process lighting program rebates, handle customer requests, and handle responses to retailer mailings. Between 10 and 20 people work for the Call Center and Direct Services, handling telephone and personal customer contacts for all DSM programs in addition to other utility business. [R#2] ■

© The Results Center

MONITORING

As a relatively small utility MGE watches all of its program expenditures, including monitoring and evaluation, with an especially close eye in order to maintain cost effectiveness. As such, only key indicators are monitored and evaluations are considered on a case-by-case basis to determine need. Monitoring for the Residential Lighting program has been focused on accounting for the number of coupons and rebates and the number and general type of installed measures, while MGE has not tracked the number of program participants.

Customers give their coupons to retailers when they purchase eligible measures who then send redeemed coupons to an MGE-contracted coupon clearinghouse in order to be reimbursed. Rebates are easy to track because they are mailed directly to MGE by the customer. Once coupons and rebates are received at MGE they are entered into the program database. Verification of whether purchased bulbs are actually installed in customer homes consists of customer statements and staff observations during on-site energy analyses. [R#2]

EVALUATION

A comprehensive program evaluation was planned for 1994 but was not performed. This evaluation was dropped in part due to a planned shift in program design and emphasis. In addition, MGE concluded from a variety of indicators the program was a success and did not want to spend money simply to reconfirm that it was running a successful program. [R#2]

In 1993 MGE administered a Residential Appliance Saturation Survey which had a section related to the Residential Lighting program. Some 52% of the 1,056 respondents had heard of the program, 38% had not, and 10% did not answer. A total of 28% of those who responded said they had participated in the program. The reasons given for not participating in the program were varied with 6% of respondents saying they did not need any of the bulbs offered, 10% felt the lighting products were still too expensive, 7% believed the savings would not be significant, 13% gave various reasons for not participating, and 68% did not respond. (Note that respondents were asked to circle all reasons that applied, creating a response total exceeding 100%). [R#9]

Also in 1993, MGE administered a Lighting Coupon Survey for Retail Stores. A total of 102 surveys were sent to retail stores and buyers in early 1993. These same stores had been asked to participate in the program in the summer of 1992. Approximately half of the stores which were sent surveys had participated in the program and of these 25 responded. MGE also received four responses from nonparticipants, one from a store buyer, and one from a wholesaler. Of the respondents 84% reported an increase in sales of lighting products, 60% reported an increase in profits, 80% reported an increase in the quantity of compact fluorescent bulbs stocked, and 52% reported an increase in the variety of bulbs stocked. In addition, 40% of respondents expressed a desire for program related training from MGE. In response, MGE ran a retailer training program prior to the 1993-94 coupon offer in which 120 store employees participated. [R#10]

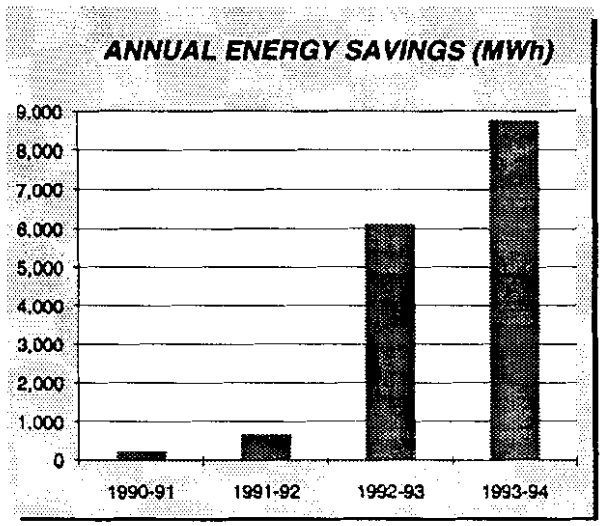
In 1991, MGE administered a Residential Appliance Saturation Survey. This survey had 1,171 respondents. For single family respondents 32% were not aware of the Residential Lighting program and 63% were aware of the program. For multi-family respondents 21% were aware of the program and 74% were not. When citing reasons for not participating in the program 20% of single-family respondents said they did not need any of the bulbs offered; 32% felt the products were too expensive; 24% did not believe the savings would be significant; and 28% had other reasons for not participating. For multi-family respondents 19% claimed that they did not need any of the bulbs offered; 32% thought the products were too expensive; 11% thought the savings would not be significant; and 37% provided other reasons. The results of this survey prompted MGE to increase program promotional and educational efforts. [R#11]

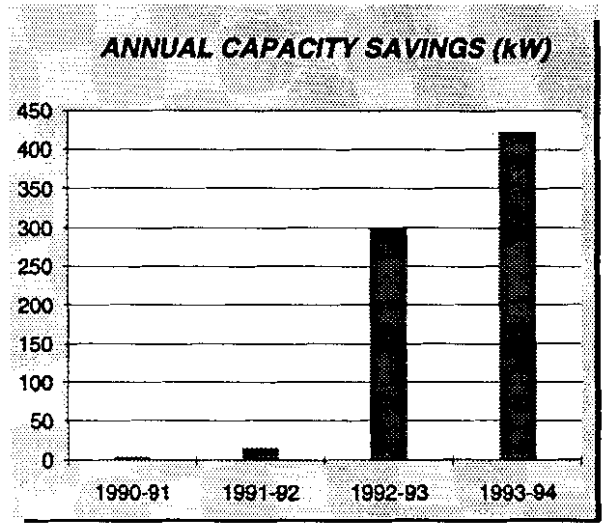
Following the three-month Middleton Pilot in 1990, MGE administered a telephone survey of 55 non-participants. In addition MGE contacted one coupon participant who was very pleased with the program. This focus on non-participants occurred because the utility wished primarily to find out why customers had not participated as opposed to why the few participants did participate in the program. Of the 55 non-participants surveyed, 17 had looked at the promotional lighting booklet promoting the program while 38 had not looked at the booklet. In general responses clearly indicated that respondents had favorable views of energy-efficient lighting, thought that lighting costs were high enough to encourage interest in coupons and rebates, and most planned to apply for rebates or use coupons in the future. Despite all of these positive responses none of these people had participated in the pilot. Clearly the survey indicated a large discrepancy between what respondents said and what respondents had actually done. Recommendations based on the survey included improving program marketing in order to increase customer awareness, creating point of purchase displays, making coupons more visible, and involving business allies. Over time all of these recommendations have been used by program staff to improve participation. [R#8] ■

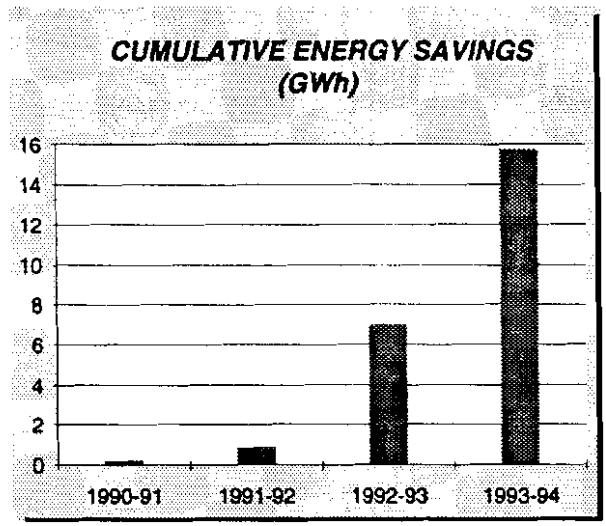
© The Results Center

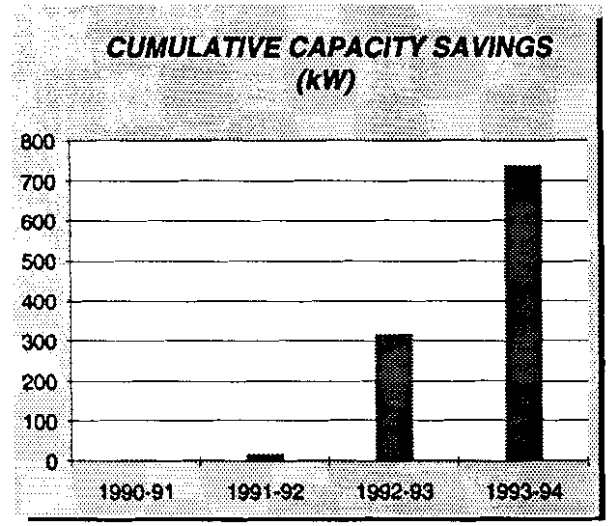
Program Savings

SAVINGS OVERVIEW	ANNUAL ENERGY SAVINGS (MWh)	CUMULATIVE ENERGY SAVINGS (MWh)	LIFECYCLE ENERGY SAVINGS (MWh)	ANNUAL CAPACITY SAVINGS (kW)	CUMULATIVE CAPACITY SAVINGS (kW)
1990-91	206	206	1,030	3	3
1991-92	663	869	3,315	14	17
1992-93	6,102	6,971	30,510	299	316
1993-94	8,782	15,753	43,910	422	738
Total	15,753	23,799	78,765	738	









© The Results Center

DATA ALERT: All savings and participation figures reported for 1993/94 contain impact data through March 31, 1994. Program savings are based solely on engineering estimates and are not derated for any factors such as free ridership.[R#12,15]

MGE's Residential Lighting program achieved annual energy savings of 8,782 MWh and peak capacity savings of 422 kW in 1993/94. From 1990/91 through 1993/94 the program has achieved 15,753 MWh of total annual energy savings, 23,799 MWh of total cumulative energy savings, and lifecycle energy savings of 78,765 MWh.

Just as energy savings have increased dramatically, capacity savings totaled 3 kW for 1990-91, increased to 14 kW in 1991-92, jumped to 299 kW in 1992-93, and 422 kW in 1993/94, resulting in cumulative capacity savings of 738 kW.[R#2]

PARTICIPATION RATES

Program participation is tracked based on the number of coupons redeemed and rebates received. From 1990/91 through 1993/94 a total of 149,978 coupons had been redeemed and 2,726 rebates had been paid out. In 1993/94 85,000 coupons and 1,472 rebates were processed.

Although MGE does not track the number of participants, the 1993 Residential Appliance Saturation Survey results suggest about 28% of its approximately 100,000 eligible customers have participated in the program. [R#2]

During 1990/91 and 1991/92, the number of couponed and rebated measures were below expectations, but jumped dramatically in 1992/93 to 59,019 couponed bulbs and 727 rebated fixtures, fully 300% of the program's goal for the year. In 1993/94 the number of couponed bulbs was 85,000, equal to 200% of the program goal, and the number of fixtures rebated was 1472, equal to 115% of the program goal.

FREE RIDERSHIP

While MGE has not formally evaluated free ridership, the utility is required to estimate free ridership for the Public Service Commission. The utility estimates free ridership for the program to be approximately 5%. This assumption is due to the state of the efficient lighting market in the utility's service area when the program began. There were only four retailers selling six models of CFLs in 1990 and sales levels were quite low. In fact, MGE believes there is a moderate level of free drivership associated with the program because sales of CFLs have occurred during months when coupons were not available. [R#2,15]

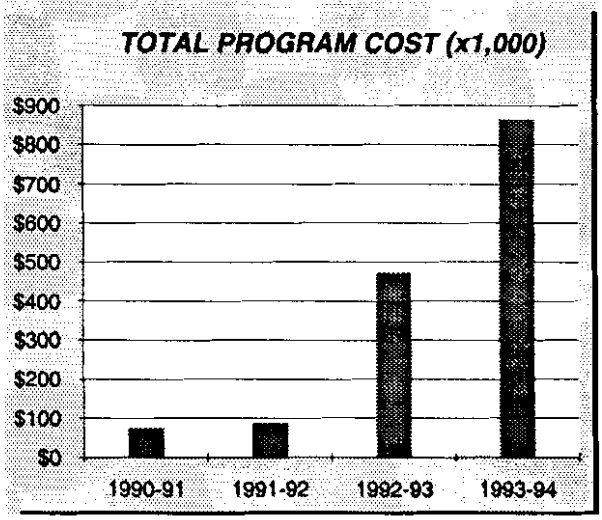
MEASURE LIFETIME

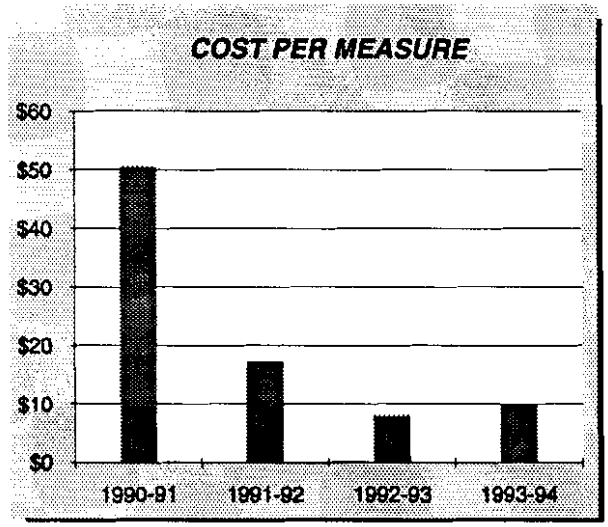
MGE has assigned an average measure lifetime of five years to the program. This estimate is based on assumed daily usage of four hours for each bulb and fixture. The first two years of the program featured a wide range of eligible products which, when combined likely had a different measure lifetime than five years. However because 96% of coupons and rebates were redeemed in the two most recent years of the program, (when almost all measures were CFLs), the utility believes the five-year figure to be the most representative. [R#3,15] ■

PROGRAM PARTICIPATION	COUPONS	REBATES	ANNUAL ENERGY SAVINGS PER COUPON / REBATE (kWh)
1990-91	1,295	148	143
1991-92	4,664	379	131
1992-93	59,019	727	102
1993-94	85,000	1,472	102
Total	149,978	2,726	

Cost of the Program

COSTS OVERVIEW	ADMINISTRATION (x1000)	INCENTIVES (x1000)	TOTAL PROGRAM COST (x1000)	COST PER MEASURE
1990-91	$66.0	$6.9	$72.9	$51
1991-92	$63.2	$23.4	$86.6	$17
1992-93	$75.8	$397.5	$473.3	$8
1993-94	$82.6	$780.8	$863.3	$10
Total	$287.6	$1,208.5	$1,496.1	





COST OF SAVED ENERGY AT VARIOUS DISCOUNT RATES(¢/kWh)	3%	4%	5%	6%	7%	8%	9%
1990-91	7.73	7.95	8.18	8.41	8.63	8.87	9.10
1991-92	2.85	2.93	3.02	3.10	3.18	3.27	3.36
1992-93	1.69	1.74	1.79	1.84	1.89	1.94	1.99
1993-94	2.15	2.21	2.27	2.33	2.40	2.46	2.53

© The Results Center

DATA ALERT: Note that all 1993/94 program cost figures are as of March 31, 1994. Dollars have been levelized based on the earlier of the two program years listed. For example, costs for 1992-93 have been levelized to $1990 using the conversion factor for 1992.[R#2]

Program costs total $1,496,100 from the period 1990/91 through 1993/94. Annual costs reached their highest point in 1993-94 at $863,300. Program costs for 1990-91 totaled $72,900, increased slightly to $86,600 in 1991-92, and then jumped tremendously to $473,300 in 1992-93. This jump is due to the fact that incentives make up most of the total program costs, so as participation increased, so did costs.[R#2]

COST EFFECTIVENESS

Prior to program implementation, MGE used the utility test to calculate benefit/cost ratios. On a per technology basis, the utility divided the net present value of program benefits by the sum of administrative and incentive costs. This exercise was performed in order to determine the level of incentives that could be offered to customers. Rebate and coupon amounts were adjusted accordingly to ensure cost effectiveness.[R#15]

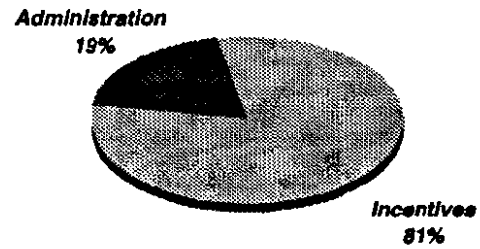
Based on a five-year average measure lifetime, The Results Center has calculated the cost of saved energy for the Residential Lighting program at varying discount rates. The first year of the program (1990/91) saw the highest cost of saved energy at 8.18 ¢/kWh at a 5% discount rate. The program's cost of saved energy dropped to 3.02 ¢/kWh in 1991/92 at a 5% discount rate. In 1992/93, the cost of saved energy decreased again to 1.79 ¢/kWh at a 5% discount rate, and increased slightly in 1993/94 to 2.27 ¢/kWh.

COST PER PARTICIPANT

While The Results Center ideally presents the cost per individual participant or installed measure, it is impossible to do so for this program because program tracking has reported the number of coupons and rebates received and not the number of participants. Therefore, annual program costs have been divided by the total number of coupons and rebates. The cost per measure was highest in the first year of the program at $51. The cost per measure dropped dramatically to $17 in 1991/92, dropped again to $8 in 1992/93, and then jumped somewhat to $10 in 1993/94.

COST COMPONENTS

During the course of the program, customer incentives have made up the large majority (81%) of total program costs, reaching $1,208,500. Administrative costs (labor, advertising & promotion, evaluation, research, transportation, and training) make up the other general program cost component, totaling $287,600 (19%) over the life of the program. The ratio of administrative costs to incentives has shifted dramatically over the course of the program. In 1990-91, administrative costs (80% of which went towards advertising and promotion) were 91% of total program costs and incentive costs were only 9%. (Of the



incentive costs, fully 65% paid for rebates with only 35% for coupon redemption. Later in the program coupons made up well over 90% of the activity.) In 1991-92, administrative costs were 73% of total costs, with incentives making up the remaining 27%, made up of 52% for coupons and 48% for rebates. In 1992-93, incentives jumped far ahead of administrative costs and accounted for 84% of total costs. In 1993-94 incentives jumped again to $780,800 or 90% of total program costs. ■

© The Results Center

Environmental Benefit Statement

AVOIDED EMISSIONS: Based on 23,799,000 kWh saved 1990 - 1994

Marginal Power Plant	Heat Rate BTU/kWh	% Sulfur in Fuel	CO2 (lbs)	SO2 (lbs)	NOx (lbs)	TSP* (lbs)
COAL:	**Uncontrolled Emissions**					
A	9,400	2.50%	51,311,000	1,217,000	246,000	25,000
B	10,000	1.20%	54,714,000	471,000	159,000	118,000
	Controlled Emissions					
A	9,400	2.50%	51,311,000	122,000	246,000	2,000
B	10,000	1.20%	54,714,000	47,000	159,000	8,000
C	10,000		54,714,000	314,000	157,000	8,000
	Atmospheric Fluidized Bed Combustion					
A	10,000	1.10%	54,714,000	144,000	79,000	39,000
B	9,400	2.50%	51,311,000	122,000	98,000	7,000
	Integrated Gasification Combined Cycle					
A	10,000	0.45%	54,714,000	97,000	16,000	39,000
B	9,010		49,216,000	35,000	12,000	2,000
GAS:	**Steam**					
A	10,400		29,844,000	0	68,000	0
B	9,224		25,917,000	0	162,000	8,000
	Combined Cycle					
1. Existing	9,000		25,917,000	0	99,000	0
2. NSPS*	9,000		25,917,000	0	47,000	0
3. BACT*	9,000		25,917,000	0	7,000	0
OIL:	**Steam--#6 Oil**					
A	9,840	2.00%	43,195,000	654,000	77,000	73,000
B	10,400	2.20%	45,813,000	649,000	97,000	47,000
C	10,400	1.00%	45,813,000	93,000	78,000	25,000
D	10,400	0.50%	45,813,000	272,000	97,000	15,000
	Combustion Turbine-#2 Diesel					
A	13,600	0.30%	57,332,000	114,000	177,000	10,000
REFUSE DERIVED FUEL: Conventional						
A	15,000	0.20%	68,065,000	175,000	231,000	51,000

© The Results Center

In addition to the traditional costs and benefits there are several hidden environmental costs of electricity use that are incurred when one considers the whole system of electrical generation from the mine-mouth to the wall outlet. These costs, which to date have been considered externalities, are real and have profound long term effects and are borne by society as a whole. Some environmental costs are beginning to be factored into utility resource planning. Because energy efficiency programs present the opportunity for utilities to avoid environmental damages, environmental considerations can be considered a benefit in addition to the direct dollar savings to customers from reduced electricity use.

The environmental benefits of energy efficiency programs can include avoided pollution of the air, the land, and the water. Because of immediate concerns about urban air quality, acid deposition, and global warming, the first step in calculating the environmental benefit of a particular DSM program focuses on avoided air pollution. Within this domain we have limited our presentation to the emission of carbon dioxide, sulfur dioxide, nitrous oxides, and particulates. (Dollar values for environmental benefits are not presented given the variety of values currently being used in various states.)

HOW TO USE THE TABLE

1. The purpose of the accompanying page is to allow any user of this profile to apply Madison Gas & Electic's level of avoided emissions saved through its Residential Lighting Program to a particular situation. Simply move down the left-hand column to your marginal power plant type, and then read across the page to determine the values for avoided emissions that you will accrue should you implement this DSM program. Note that several generic power plants (labelled A, B, C,...) are presented which reflect differences in heat rate and fuel sulfur content.

2. All of the values for avoided emissions presented in both tables include a 10% credit for DSM savings to reflect the avoided transmission and distribution losses associated with supply-side resources.

3. Various forms of power generation create specific pollutants. Coal-fired generation, for example, creates bottom ash (a solid waste issue) and methane, while garbage-burning plants release toxic airborne emissions including dioxin and furans and solid wastes which contain an array of heavy metals. We recommend that when calculating the environmental benefit for a particular program that credit is taken for the air pollutants listed below, plus air pollutants unique to a form of marginal generation, plus key land and water pollutants for a particular form of marginal power generation.

4. All the values presented represent approximations and were drawn largely from "The Environmental Costs of Electricity" (Ottinger et al, Oceana Publications, 1990). The coefficients used in the formulas that determine the values in the tables presented are drawn from a variety of government and independent sources. ■

• Acronyms used in the table

TSP = Total Suspended Particulates
NSPS = New Source Performance Standards
BACT = Best Available Control Technology

LESSONS LEARNED

MGE's Residential Lighting program has clearly made inroads towards transforming the area lighting market as witnessed by the tremendous jump in the number of customers using compact fluorescent lamps, along with the exponential increase in the number of retailers selling a variety of CFL brands and models. MGE believes that participating retailers will continue to stock a variety of replacement products in the future. However, the true test of the depth and sustainability of complete market transformation (retailers and consumers) will occur as the incentive component of the program is phased out and customers are faced with the "real" purchase price of CFLs. MGE believes customers will continue to purchase efficient lighting products with reduced incentives. The utility is prepared to tailor its efforts as necessary to stimulate and support customer purchases of efficient lighting products. [R#2]

Perhaps the number one lesson learned from the program is if at first you don't succeed, try, try again. Despite the slow take off in the first two years of implementation, MGE was confident the program would work. Eventually impressive participation was achieved in large part due to a great deal of flexibility and persistence on the part of the utility. MGE did not just sit on its initial program design, hoping that things would improve. Constant and ongoing changes were made to the program in response to numerous evaluations, surveys, and one-on-one interactions with retailers, manufacturers, and consumers.

Many of the issues encountered by MGE throughout the course of the program and the resulting lessons learned are listed below:

Carefully monitor the program throughout the implementation phase: MGE used evaluations, customer telephone surveys, customer focus groups, staff observations, and input from business allies to continually make changes to the program design mechanisms. These ongoing refinements allowed the utility to eventually reach and exceed the participation goals it sought. [R#7]

Lack of customer product knowledge: This barrier was addressed by expanding the amount and type of lighting information available to customers through the distribution of numerous informational brochures. MGE mailed brochures directly to customers and also made information available in retail stores. Similarly, business allies had to be educated about the benefits of CFLs. MGE also used a variety of advertising techniques to increase program awareness. [R#7]

Inadequate product availability and identification: Initially customers were having trouble finding and/or identifying the qualifying lighting products. MGE worked extensively with retailers and manufacturers to increase the availability of products and get retailers to help promote the program. The utility also sent customers a list of retailers carrying CFLs. MGE provided retailers with point-of-purchase promotional materials and encouraged them to maintain these promotions as well as product stock. [R#7]

Retailers hesitancy to commit time, money, and space to the program: Initially retailers were wary of making a strong commitment to the program. To counter this, MGE offered to pay cooperatively for product advertising, provided free display materials as well as display design assistance, and provided extensive sales staff training and demonstrations. MGE also enlisted manufacturer support by helping them with sales goals and getting manufacturers to provide further rebates as well as ensuring product availability and providing quantity pricing and buy-back guarantees. [R#7]

Pitfalls in relying on customers to bring coupons to the store: MGE concluded that program participation was suffering early on because participation depended upon

© The Results Center

customers remembering to bring program coupons to the store with them. The utility simply made coupons available in the stores and participation increased dramatically. [R#7]

How to avoid coupon use by non-MGE customers: An early concern on the part of the utility was that people who were not MGE customers would be able to redeem coupons. In order to address this issue in the most cost-effective manner, MGE distributed coupons as bill stuffers, required customers to supply their name and address on coupons, and required retailers to verify this customer information. MGE also checked a portion of redeemed coupons to ensure that participants were indeed MGE customers. [R#7]

Limit free ridership and/or marginal cost effectiveness of certain technologies: In order to address these issues, some technologies were made ineligible and rebates were reduced. In 1993-94 for example, qualifying technologies were limited to $5 and $10 coupons for CFLs and $15 rebates for compact fluorescent fixtures and $30 rebates for high pressure sodium fixtures. [R#7]

Size of utility: MGE's relatively small size has been both a help and hindrance to the program. The utility's size has meant that program tracking and evaluation have been somewhat limited due to budget constraints. On the other hand, having a small service area has allowed MGE to work very closely with both customers and retailers. Such close one-on-one contact has led MGE to constantly fine tune the program, creating very high levels of customer and business ally satisfaction.

TRANSFERABILITY

MGE believes coupon/rebate programs for residential lighting are more effective in achieving market penetration in the long run than direct install, direct sales, and leasing programs. This is because ideally a rebate program will create an established and sustainable retail infrastructure of lighting products. MGE believes that once satisfactory levels of participation have been achieved through a coupon/rebate program, customer incentives can be reduced and largely replaced by customer education and partnerships with business allies. Ideally customers will have learned the benefits of efficient lighting products and will readily purchase these measures from the retailer infrastructure that the program helped to establish. For similar programs MGE emphasizes that it is crucial to identify and promote the individual customer and social benefits of the technologies as opposed to simply describing program features such as incentive levels and assuming that participation will take care of itself. [R#2]

This type of program is clearly transferable as witnessed by the many utilities who have implemented similar programs. One of the first successful large-scale residential compact fluorescent bulb technology lighting coupon programs was implemented by Central Maine Power in 1991. This program was studied closely by MGE midstream and the lessons learned in Maine allowed MGE to enhance its program and achieve its goals. Other utilities who have implemented similar programs include Consumers Power, Detroit Edison, Los Angeles Department of Water & Power, Northern States Power, Potomac Electric Power, Ontario Hydro, and Southern California Edison. [R#2]

For other utilities who are interested in implementing a similar program and have a larger DSM budget than MGE, a more detailed program database which tracks the number of actual customers participating as well as the number and type of the precise product purchased would allow for more in-depth program evaluation. ■

Regulatory Incentives and Shareholder Returns

REGULATORY TREATMENT

The purpose of this section is to discuss the regulatory treatment of the costs of Madison Gas & Electric's Residential Lighting program. To do so, a brief review of the regulatory treatment of all Wisconsin utilities in regard to IRP and DSM is presented, followed by an overview of the regulatory treatment of MGE's portfolio of DSM programs, and the specific regulatory treatment of the Residential Lighting program. More comprehensive discussions of the regulatory treatment of Wisconsin's utilities regarding DSM can be found in Profiles #24, 32, and 44.

STATE REGULATORY OVERVIEW

Wisconsin's procedures for rate review, use of future test year in annual rate cases, and accounting for DSM expenditures have removed many of the financial disincentives to DSM and have provided for thorough DSM cost recovery. On the other hand the Wisconsin Public Service Commission, Wisconsin's regulatory body, has considered and tested a variety of shareholder incentives mechanisms with the four major utilities in the state since 1987, however no shareholder incentive mechanisms are active in the state at this time. In general, Wisconsin utilities seem motivated to provide DSM to serve customers and manage costs. [R#14]

State power plant siting law requires utilities to file Advance Plans approximately every two or three years which must include analyses of alternative resources. The Integrated Resource Planning process is implemented in Wisconsin through these plans. In 1986 the Commission ordered utilities in the state to use a least-cost integrated planning process in which all reasonable options for both supply and demand are assessed, including long term social and environmental costs. An environmental externalities adjustment, or "noncombustion credit", of 15% is applied to selected nonfossil fuel resources and was instituted in 1989. This was replaced with explicit cost adders for greenhouse gases in 1992. Currently utilities and interveners have filed preliminary materials for Advance Plan 7, beginning yet again what has become a lengthy yet important process. [R#14]

Utilities in Wisconsin have been able to recover DSM expenditures either as expenses or as capitalized expenditures through a conservation escrow account. The order on the escrow account goes back to 1977; the rate-basing treatment provision was the result of an order passed in 1986. The conservation escrow account, like a balancing account mechanism, allows the utility to collect DSM expenditures, dollar for dollar, reconciling actual with recovered expenditures. [R#14]

In 1989, the Commission staff asked the utilities to consider an Electric Revenue Adjustment Mechanism (ERAM) as a means of removing the lost revenue disincentive from demand-side management. The utilities rejected ERAM for Wisconsin because of its short term perspective and potential effects on large customers. (Recovering lost revenues increases the rate impacts of DSM, thus making utilities' power rate less competitive.) Thus no ERAM has been instituted in Wisconsin. [R#14]

UTILITY REGULATORY OVERVIEW

Currently Madison Gas & Electric collects the costs of its DSM programs by expensing certain costs and ratebasing, or capitalizing, others. Information programs, while clearly providing value, are more difficult to quantify in terms of impact and are thus expensed in the current year. Incentives such as rebates that can be directly tied to specific pieces of equipment, on the other hand, are ratebased, allowing shareholders the company's rate of return on this capital expenditure. Thus while some programs are completely expensed, most of MGE's programs' costs are split for accounting purposes and cost recovery takes parallel paths. [R#17]

In June of 1988, the Wisconsin Public Service Commission and Madison Gas & Electric participated in an interesting experiment. In order to determine how DSM services could be most cost effectively implemented and to

© The Results Center

stimulate both the utility and vendors in the area to ramp up their DSM capabilities, a pilot program was launched and conducted.

The pilot ran from the fall of 1988 to February 1990 and involved a competition between the utility and contractors for providing conservation services to MGE customers in the multifamily rental market, the small commercial and industrial market, and the large commercial and industrial market. A scoring system was used to determine the "winner" in each sector to whom went a small bonus based on margin of victory. [R#14]

When the results came in, the utility was declared the winner in the multifamily rental market and the small commercial and industrial market. One of the competitors was the winner in the large commercial and industrial market. No action to extend the pilot on a larger scale has been taken since completion of the pilot. Utility staff believe that the pilot did indeed stimulate the marketplace and caused the utility to focus greater attention on the cost effective delivery of DSM. [R#14,17]

PROGRAM-SPECIFIC INFORMATION

The Residential Lighting program has been treated with the same general formula for cost recovery as most of MGE's programs. Incentive costs, for coupons and rebates, are ratebased, while all other administrative costs have been expensed.

Note that while the Commission was concerned about the Residential Lighting program in its early years, when its impacts were far short of its goals, the program was never subject to any form of performance-based treatment. (Under such a scenario the utility would have been penalized for under-achievement, and rewarded for reaching goals and over-achievement.) This allowed MGE to continue to refine the program without penalty, allowing the program to flourish over time and to subsequently dramatically surpass its goals and create a significant transformation in the residential lighting market.

FUTURE DIRECTIONS IN WISCONSIN

According to the Wisconsin Public Service Commission staff, what's happening in Wisconsin may not suit other states at all but certainly presents an interesting case study. Wisconsin has dropped shareholder incentives at least for the time being, but this move has not affected DSM activity. Wisconsin remains one of the most aggressive DSM states in terms of the percentage of gross revenues spent on DSM. Some of the individual utilities and the Commission are still looking for a mechanism to encourage DSM efforts and to agree upon a level of measurement that is acceptable to both utilities and interveners. [R#14]

In Advance Plan 6 the Commission expressed that it is still interested in stockholder incentive mechanisms and said it will certainly consider any proposed mechanisms. In anticipation of utility proposals, the Commission presented a set of criteria, or guidelines, that utilities must meet to be eligible for the incentives. Advance Plan 7, will likely address shareholder incentives again, but with utilities' new-found attention and perceptions of the coming era of open access and retail wheeling, shareholder incentives may seem untenable and undesirable. [R#14] ■

References

1. Madison Gas and Electric Company, "1993 Annual Report," 1994.

2. Eileen Vandoros, Senior Market Analyst, Madison Gas & Electric, personal communication, May - September, 1994.

3. Madison Gas & Electric Company, "1991/92 Test Year, Quarterly Progress Report, June 1991 - May 1992,"1992

4. Madison Gas & Electric Company, "June 1992 - May 1993 Test Year, Quarterly Progress Report, March 1993 - May 1993," 1993.

5. Madison Gas & Electric Company, "June 1993 - December 1994 Test Year, Progress Report, June 1993 through January 1994," 1994.

6. Madison Gas & Electric Company, Residential Lighting program promotional materials, 1990 - 1994.

7. Eileen Vandoros, Madison Gas & Electric Company, "Building a Long-Term High-Efficiency Lighting Marketplace," presentation at the Affordable Comfort Conference, Philadelphia, Pennsylvania, March 22, 1994.

8. Kathleen Standen, Madison Gas & Electric, "Summary of Pilot Lighting Evaluation Results," June 29, 1990.

9. Madison Gas & Electric, "Residential Appliance Saturation Survey, preliminary results," 1993.

10. Madison Gas & Electric, "MGE Lighting Coupon Survey for Retail Stores," 1993.

11. Madison Gas & Electric, "1991 Residential Appliance Saturation Survey Results," August 1992.

12. Jeff Ford, Senior Market Analyst, Madison Gas & Electric, personal communication, July 1994.

13. Madison Gas & Electric, "Energy Management Program Book," April 15, 1994.

14. National Association of Regulatory Utility Commissioners, "Incentives for Demand-Side Management," March 1993.

15. Chuck Sasso, Marketing Engineer, Madison Gas & Electric, personal communication, July 1994.

16. Kim Koss, Supervisor, Customer Research & Data, Madison Gas & Electric, personal communication, July 1994.

17. Bob Stoffs, Senior Marketing Representative, Madison Gas & Electric, personal communication, March - August 1994.

Special thanks to Eileen Vandoros for her guidance and intense dedication to detail throughout the development of this profile.