
Wisconsin Electric

Smart Money for Business

Profile #32, 1992

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Executive Summary

Wisconsin Electric's (WE) Smart Money for Business encourages commercial, industrial, and agricultural customers to install energy-efficient equipment during renovations, new construction projects, retrofits, and routine equipment replacements. Through well-designed marketing campaigns and attractive incentive levels, customers are encouraged to retrofit with energy-efficient products even when they had not been planning to replace their existing equipment. Additionally, the program provides no- or low-interest loans for energy saving projects.

For the Smart Money for Business Program, lighting measures accounted for the majority of projects (about 84%), demand savings (64%), energy savings (70%), and net benefits (70%). Lighting only accounted, however, for 56% of the rebates and loans given. Air conditioning and process measures, while accounting for only 5% and 1% respectively of the projects, provided the largest remaining fraction of savings rebates and loans given and net benefits.

Smart Money for Business has been highly successful in its service area, with a participation rate of 35%. Eligible customers can participate in one of three ways. (1) The customer may make the qualifying purchase and receive an instant rebate at participating dealers. (2) In cases where customers are planning large renovations, retrofits, or new construction projects, a Wisconsin Electric sales representative generally contacts the prospective participants to inform them of the program or these customers may contact the utility and ask a sales representative for assistance and information on the efficiency options available. (3) A trade ally, such as a lighting contractor or HVAC vendor, may initiate contact with potential customers, informing them of the benefits available through Smart Money for Business as part of their own marketing process.

In 1991 Smart Money for Business achieved net demand savings of 28.4 MW and 132.9 GWh in annual energy savings. Between 1987 and 1991, the program has accumulated 670.6 GWh in annual energy savings, and 150.3 MW in annual peak capacity savings. In 1991 the Smart Money for Business program also achieved the following results: about \$25 million in net benefits, more than 7,000 participants with more than 35,000 projects completed, and about \$13 million in loans and rebates were processed.

Between 1987 and 1991, the program has issued \$81.9 million in rebates, \$11.5 million in loans for a total of \$93.4 million. The cost of saved energy for the program in 1991, based on a 10-year lifetime and only incentive payment costs, ranged from 1.12 ¢/kWh to 1.49 ¢/kWh. The average incentive payment per applicant was \$6,050 in 1987, peaking at \$7,400 in 1988, and then dropping each year to its 1991 low of \$1,700.

Smart Money For Business

Utility: Wisconsin Electric

Sector: Commercial, Industrial, Agricultural

Measures: Lighting, HVAC, water heating, refrigeration, control, process and farm equipment.

Mechanism: Rebates and loans

History: Pilot program in 1987.

1991 Program Data

Energy savings: 133 GWh

Lifecycle energy savings: 1,329 GWh

Capacity savings: 28.4 MW

Cost: \$12,748,900

Cumulative Data (1987-1991)

Energy savings: 1,812 GWh

Lifecycle energy savings: 6,706 GWh

Capacity savings: 150.3 MW

Cost: \$93,441,700

Participation rate: 35%

Conventions

For the entire 1992 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 International Monetary Fund's International Financial Statistics Yearbook: 1991.

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.

Utility Overview

Wisconsin Electric Power Co. is the principal subsidiary of Wisconsin Energy Corporation, along with Wisconsin Natural Gas Co., and five nonutility subsidiaries. The headquarters for Wisconsin Energy Corporation are located in Milwaukee, Wisconsin. Wisconsin Electric's service area includes portions of southeastern, central, and northern Wisconsin. Service is provided to the Upper Peninsula of Michigan and also includes metropolitan Milwaukee. The service territory serves a population of more than 2 million, and Wisconsin Electric has more than 900,000 customers. Over 5,000 people are employed by Wisconsin Energy. [R#1,4]

Energy sales for Wisconsin Electric in 1991 were 25,016 GWh, creating \$1.2 billion in revenues. Of the energy sold by Wisconsin Electric, 61.5% came from fossil fuels, 27.6% came from nuclear power, 9.3% came from purchased and interchanged energy, and 1.6% was from hydroelectric power. Residential customers bought 6,587 GWh while small commercial and industrial customers purchased 6,153GWh. The large commercial and industrial sector accounted for the largest percentage of sales, buying 9,462 GWh. The rest (2,814 GWh) was sold to wholesale and municipal customers. Peak demand for the year was 4,797 MW, while peak generating capacity at the time of peak demand was 4,769 MW. The zero reserve margin was covered by purchased energy. [R#4]

Wisconsin Electric has made several organizational changes in response to competition from new nonutility entrants in the power generation arena. A two-part strategy

WISCONSIN ELECTRIC 1991 STATISTICS

Number of Customers	901,262
Energy Sales	25,016 GWh
Energy Sales Revenue	\$1.238 billion
Peak Demand	4,797 MW
Generating Capacity	4,769 MW
Reserve Margin	0 %
Average Electric Rates	
Residential	6.77 ¢/kWh
Small Commercial & Industrial	5.91 ¢/kWh
Large Commercial & Industrial	3.94 ¢/kWh

[R#1,4]

has been adopted which focuses on both helping current customers become as energy-efficient as possible and building new power sources. Plans for additional power sources include building "peaking" plants designed to handle peak daytime electricity demand. Wisconsin Electric's 1991 Strategic Plan calls for the company to "continue to develop, expand and support recycling and other by-product utilization, energy conservation and pollution prevention programs." [R#4,15]

Utility DSM Overview

Wisconsin Electric significantly expanded its involvement with DSM programs in 1987. Most of Wisconsin Electric's DSM programs fall under the Smart Money Energy Programs umbrella. The Smart Money Program is one of the largest conservation programs in the country on a per customer basis, and it has received numerous state and national awards. Between 1987 and 1992, DSM programs at Wisconsin Electric have reduced net demand by over 270 MW, thus forestalling future needs for new powerplant capacity. Since 1987 commercial and industrial customers have completed over 92,000 DSM projects through Smart Money, and residential customers have made more than 725,000 energy efficiency improvements. Total DSM costs in 1991 for Wisconsin Electric were 3.2% of 1991 total revenues. Since first implementing DSM programs in 1987 Wisconsin Electric has never spent less than 3.0% of total annual revenues on its DSM programs. Wisconsin Electric predicts that in the year 2000, DSM programs will have reduced annual demand by 10% from what would have been expected otherwise.[R#1,2]

Utility DSM Overview Table	Annual DSM Expenditure (x1000)	Annual Energy Savings (GWh)	Annual Capacity Savings (MW)
1987	\$36,892	66	21
1988	\$54,384	213	46
1989	\$45,874	174	45
1990	\$46,411	240	60
1991	\$38,573	161	47
Total	\$222,132	854	219

CURRENT DSM PROGRAMS AT WISCONSIN ELECTRIC

RESIDENTIAL SMART MONEY PROGRAMS

Rebate

Appliance Turn-in

Load Management

COMMERCIAL/INDUSTRIAL SMART MONEY PROGRAMS

Retrofit/Replacement Rebate and Loan

New Construction Rebate and Loan

Instant Rebate

Flexible Financing Options

Energy Service Company Program Assistance

Load Management

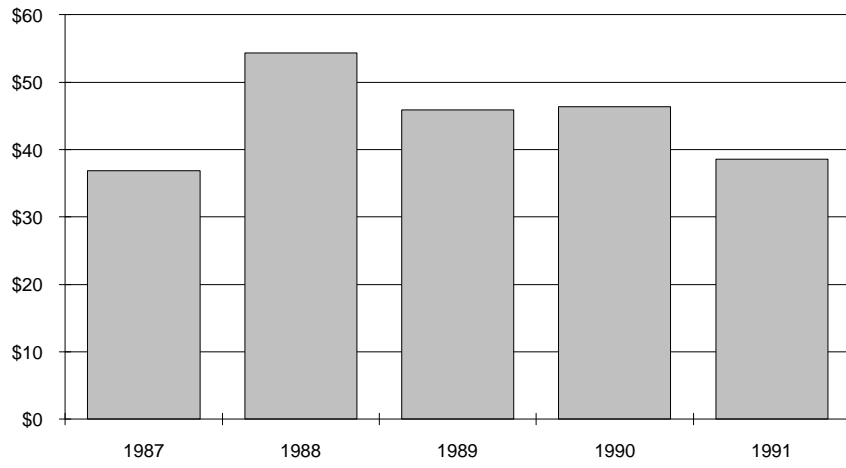
OTHER DSM PROGRAMS

Energy Partners-Central Air Load Control & Water Heater Direct Load Control

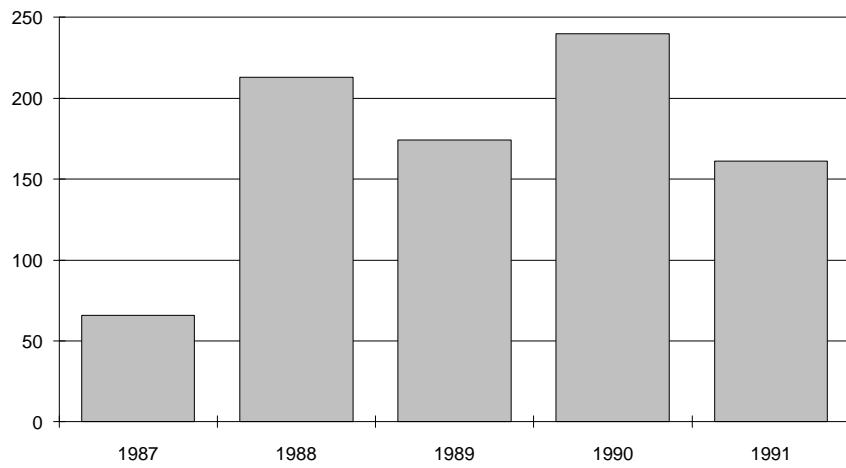
DSM Programs under the Smart Money Energy Program had impressive achievements in 1991. More than 81,000 customers participated in close to 147,000 projects. Approximately 49,000 lighting measures were installed with net benefits of over \$19 million. In addition, Wisconsin Electric's Appliance Turn-In program gathered more than 40,000 appliances. 1991 Smart Money programs accounted for 160,000 tons of avoided carbon dioxide emissions, and Wisconsin Electric coal purchases were reduced by 76,000 tons.[R#2]

The DSM expenditures shown in the DSM Overview Table reflect energy efficiency programs and load management programs. However, capacity savings due to certain load management programs (which are, in essence, rate options) are not included in figures shown in the table. Between 1987 and 1991, these load management programs (including Interruptible Rates, Curtailable Rates, and the Water Heater Direct Load Control Program), have generated total capacity savings of approximately 70 MW.[R#2]

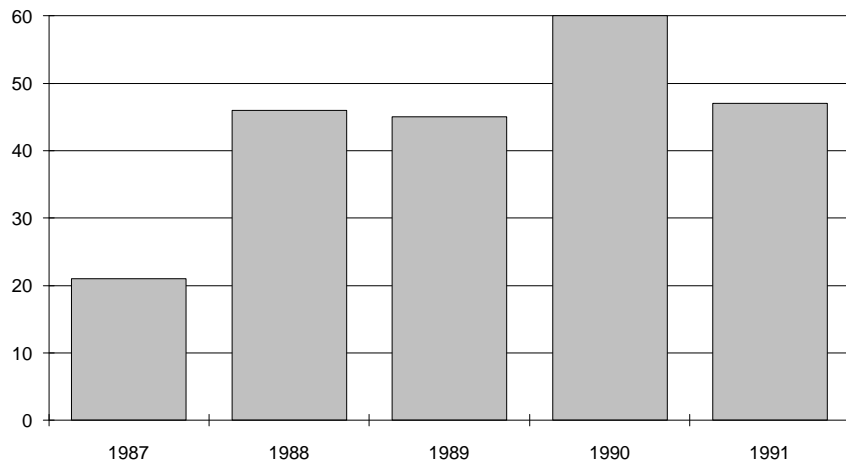
**ANNUAL DSM
EXPENDITURE
(\$1,000,000)**



**ANNUAL ENERGY
SAVINGS (GWH)**



**ANNUAL CAPACITY
SAVINGS (MW)**



Program Overview

Wisconsin Electric's Smart Money for Business encourages commercial, industrial, and agricultural customers to install energy-efficient equipment during renovations, new construction projects, retrofits, and routine equipment replacements. Through well-designed marketing campaigns and attractive incentive levels, customers are encouraged to retrofit with energy-efficient products even when they had not been planning to replace their existing equipment. Additionally, the program provides no- or low-interest loans for energy saving projects.

Smart Money for Business is delivered either through rebates to customers, or rebates to dealers. Through the Flexible Financing component of the Smart Money for Business program, combinations of rebates and low- or no-interest loans are offered to optimally meet the customer's financing needs. Additionally, some projects are referred to Energy Service Companies (ESCOs), who, through the ESCO Pilot program, assist customers with projects from the design stage, project financing and rebate applications, and installation and construction.

Rebates to customers are delivered through the Rebate and Loan Product initiated in 1987. The programs offer incentives for non-residential customers who are either replacing existing equipment with energy-efficient alternatives or who are installing qualifying products as part of a new construction or renovation project.

Rebates to dealers, or Instant Rebates, were introduced in 1991. Through approximately 100 participating dealers, non-residential customers can receive point-of-purchase discounts of up to \$1,000 on high efficiency motors, as well as discounts on energy-efficient lamps and fixtures.

Through Flexible Financing, program participants can obtain low- or no-interest loans for Smart Money projects. The loans may be in amounts starting from \$2,000, with repayment periods up to seven years. Businesses can also pre-qualify for yearly loans up to \$100,000, and borrow portions of the total qualifying amount as needed. Rebates and loans can be combined to allow financing of entire projects.

The ESCO pilot program, begun in 1991, promotes the use of energy service companies to targeted customer groups and provides energy audits, feasibility studies, project management, financing programs, general contracting, monitor-

ing and maintenance programs, and government grant and program information.

As the Smart Money for Business program has evolved since its inception in 1987, Wisconsin Electric has seized many opportunities to improve the program and increase participation rates. Perhaps the best example of this responsiveness to program needs was the Commercial Lighting Retrofit Product, a direct installation program introduced in 1990 after studies revealed that only 16% of Wisconsin Electric's small commercial customers had participated in the Smart Money Energy Program. The program was aimed at introducing small commercial customers to energy-efficient lighting technologies while at the same time acquainting customers with the other DSM programs for which they were eligible. Overseen by the Marketing Department's Demand-Side Administration Group, contract staff handled program promotion through direct mail and door to door canvassing of small businesses. Over 90 trade allies participated as installation contractors, performing a lighting audit and installing energy-efficient lights free of charge. [R#13] Over 27,500 multi-family and small commercial customers participated in this program; net benefits of almost \$2 million were realized and savings of more than 29,500 net MWh resulted from the program. (Net benefits are "the avoided cost of the measure savings adjusted for free riders, less rebates and program administration costs.") [R#2] Having reached its goals, the program was eliminated, as had been planned, in 1991. [R#2,3]

In 1991 the Smart Money for Business program achieved the following results:

- about \$25 million in net benefits,
- more than 7,000 participants with over 35,000 projects completed,
- more than 132 net GWh saved,
- more than 28 net MW saved,
- about \$13 million in loans and rebates.

Lighting measures accounted for the majority of projects (about 84%), demand savings (64%), energy savings (70%), and net benefits (70%). Lighting only accounted, however, for 56% of the rebates and loans given. Air conditioning and process measures, while accounting for only 5% and 1% respectively of the projects, provided the largest remaining fraction of savings rebates and loans given and net benefits. [R#2, p17]

Implementation

MARKETING

Smart Money for Business is marketed through the Retail Markets section of Wisconsin Electric's Marketing department. The Retail Markets section is divided into four market-segment-specific management groups. These groups are: Industrial Markets, Commercial Retail, Office and Farm (ROF), Commercial Lodging, Institution and Food Service (LIFS) market, and Residential Markets.

The Smart Money for Business program is promoted through advertising on radio, in newspapers, and in market specific trade publications. Attractive flyers, brochures, special mailings, bill inserts, and a quarterly newsletter "Energy Management Trends" assist the sales executives and sales representatives, who, along with trade allies, play the key role in informing customers of the program. In 1989, a survey of participants in the Business Retrofit/Replacement Rebate program indicated that personal contact by sales executives and customer sales representatives, and presentations at association meetings were the most effective methods of informing participants of the program.[R#3]

Wisconsin Electric's marketing efforts center around a targeted approach of focusing on the needs and interests of each market segment. For example, Wisconsin Electric publishes a newsletter, "Energy and Agriculture", for agricultural customers, which highlights energy-efficient products eligible for incentives through Smart Money.

DELIVERY

Participation in Smart Money for Business may be initiated in one of three ways. (1) When performing routine maintenance or replacing standard equipment, the customer may make the qualifying purchase and receive an instant rebate at participating dealers. (2) In cases where customers are planning large renovation, retrofit, or new construction projects, a Wisconsin Electric representative generally contacts the prospective participants to inform them of the program and assist them through the application process. Conversely, such customers may initiate contact for assistance and information on the options available through Smart Money for Business. (3) A trade ally, such as a lighting contractor or HVAC vendor, may initiate contact with potential customers, informing them of the benefits available through Smart Money for Business as part of their own marketing process.[R#7]

For the Instant Rebate component, the rebate is deducted from the price of the motor or lighting equipment at the point of purchase. The dealer fills out a one-page rebate form with the customer name, address, and Wisconsin Electric customer account number, type of business, and type of product purchased. The dealer then mails the form to Wisconsin Electric, along with an itemized invoice showing the item purchased and the amount of the discount received by the customer. Dealers are reimbursed for the amount of the rebate plus a handling fee.[R#6]

In order to receive a rebate through methods (2) or (3) described above, customers first contact a WE representative to determine project eligibility. After the customer receives a letter of agreement from WE equipment may be purchased and installed. The customer then notifies their WE representative upon project completion and provides the appropriate proof of purchase. WE reconciles the proof of purchase documents and performs a site inspection to ensure that the terms of the original agreement have been fulfilled. Incentive checks are usually issued in less than two weeks following the final inspection.

If the customer desires financing assistance, it is provided in conjunction with the rebate programs, through Flexible Financing. Additionally, if a Wisconsin Electric representative determines that the project could best be implemented with the assistance of an Energy Service Company, then the customer is referred to prospective ESCOs capable of handling their specific project.

MEASURES INSTALLED

A variety of different products and services are offered through Smart Money for Business. The incentive-based programs offer rebates for lighting, HVAC, water heating, refrigeration, controls, process improvements, and farm equipment. Representative rebate amounts are shown in the Rebate Amounts Table. Also included in the program are cost sharing for feasibility studies and incentives for load management.

STAFFING REQUIREMENTS

Approximately 60 individuals work full time in the field implementing Smart Money for Business. In addition, these individuals are supported by approximately 30 full time

Implementation (continued)

contract employees, located at Wisconsin Electric's regional offices, who perform engineering and data processing functions. About 25 full-time contractor staff are employed centrally, involved in administration, quality assurance, and

technical support. The entire processing mechanism and contractor operations for this program are managed by 4 individuals in the Demand Side Administration group of WE's Marketing Department. [R#7,8,13]

WISCONSIN ELECTRIC CORPORATE MARKETS SMART MONEY PROGRAM SAMPLE REBATES

Lighting

Fluorescent lamp conversion	\$0.50 - \$2 / lamp
Compact fluorescent lamps	\$7 - \$14 / lamp
Current limiters	\$10 / fixture
Incandescent conversion	\$1.00 - \$3.75 / lamp
Reflectors	\$10 / fixture
Energy-efficient ballasts	\$4 - \$41 / ballast
Exit lights	\$15 - \$50 / fixture
Daylighting controls	up to \$200 / kW controlled
Occupancy sensors	\$25 - \$50 / fixture
Energy-efficient HID fixtures	\$50 - \$60 / fixture
Compact fluorescent lamp fixtures	\$15 - \$30 / fixture

HVAC

Solar films	\$0.80 / sq. ft.
High-performance glazing	\$0.40 - \$0.80 / sq. ft.
High-efficiency air conditioning	\$20 - \$35 / ton + \$4 / 0.1 EER above minimum
High-efficiency chillers	\$10 - \$40 / ton + \$3 / 0.01 kW/ton below maximum
Envelope insulation	\$0.10 / sq. ft.
Thermal storage	up to \$350 / kW + \$0.08 / kWh shifted off-peak

Water Heating

Water heater wrap	\$10 / wrap
Low-temperature dishwashers	\$30 - \$50 / kW removed
Heat pump water heater	\$1,100 - \$3,000

Controls

Energy management control systems	variable
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Refrigeration

Strip curtains	\$5 / lineal foot
Glass doors	\$90 / lineal foot
Ice machines	\$50 - \$350

Process

High-efficiency three phase motors	\$20 - \$1,200
Tank insulation/covers	\$0.50 / sq. ft.

Farm

Dairy heat recovery	\$450 - \$600
Stock waterers	\$25 - \$50
Milk precooler	\$350
Fluorescent fixtures	\$25
High pressure sodium fixtures	\$30
Electric water heaters	\$50 - \$80

Monitoring and Evaluation

MONITORING

Up until 1991, the Smart Money for Business program had been tracked via several databases. A new system was designed in 1990 and installed in 1991 to consolidate information into one source shared by all users, facilitating program implementation, processing, administration, and evaluation. The new system provides application processing and tracking for all components of the program, from the time initial customer contact is made to the printing of rebate checks. The database has several security features which ensure program and data integrity.[R#3]

Beginning in April, 1992, Wisconsin Electric conducted metering, billing, and engineering analysis of program participant energy consumption in order to assess persistence of measures and to determine energy and demand impacts of the Rebate and Loan Product. This monitoring is being conducted as part of the comprehensive evaluation of the Smart Money for Business Rebate and Loan Product described in further detail below.

Wisconsin Electric is also conducting a short-term end-use metering project in 1992 and 1993. Metering is conducted for one to two weeks at sites where Smart Money for Business participants are installing energy-efficient equipment. Data generated from this project is being used to help calibrate engineering estimates and energy and demand impacts for specific end uses. It will also be used to revise the hourly load model as part of a Conditional Demand Analysis study.[R#2,7,8]

EVALUATION

Wisconsin Electric has greatly expanded its DSM program evaluation since 1987. The 1992 evaluation budget of over \$1 million is more than double 1991 evaluation expenditures. Before 1989, most of Wisconsin Electric's evaluation efforts focused on process and market evaluation issues such as advertising effectiveness, customer satisfaction, customer response, and whether products were reaching the targeted markets. In 1989, evaluation efforts became more focused towards the product development, delivery, and implementation process. Specific study topics included market segmentation, trade ally response, and appropriate incentive levels.

In 1991, Wisconsin Electric developed a detailed impact and process evaluation plan. The plan sets forth a schedule for evaluating all of the products and delivery mechanisms offered through the Smart Money Energy Program by the end

of 1994. For the Smart Money for Business programs, impact evaluations for each method of delivery will provide estimates and ranges of the demand and energy impacts of the measures, including determination of the validity of engineering estimates, quantification of free-ridership and an evaluation of persistence and reliability issues. The process evaluations will focus on marketing and program implementation, including assessments of incentive levels, participation rates, free-ridership, measure retention, and the effects of the program on the market for energy-efficient products.

In addition, each evaluation will address issues specific to the product. An evaluation of the Smart Money for Business Retrofit/Replacement product is underway, with completion expected in the first quarter of 1993. Similarly, the New Construction Rebate and Loan impact and process evaluations, slated to be initiated in 1993, will assess current design practices to develop recommendations for program enhancement. The Instant Rebate Product evaluation will be conducted during 1993 and 1994.

Wisconsin Electric's "1991 Annual Evaluation Report For Wisconsin Electric's Demand-Side Management Programs" provides a detailed description of the utility's ongoing evaluation plans. Additionally, the report contains comprehensive results for the Smart Money for Business program for 1987 through 1991.[R#2]

DATA QUALITY

Energy savings and capacity savings shown in the Savings Overview Table report the net impacts of all aspects of the Smart Money for Business programs. The energy savings and capacity savings bar charts show both gross and net impacts. Gross impacts are the demand and energy savings attributable to conservation and load management measures implemented through Wisconsin Electric's demand-side products before discounting the effects of free riders. Net impacts are gross impacts less the estimated effects of free ridership.

The costs presented in this profile, unlike most other Results Center profiles, reflect only WE's incentive costs (rebates and loans). Administrative costs are not included. Thus the cost per participant and the "total" costs presented underestimate total actual expenditures.

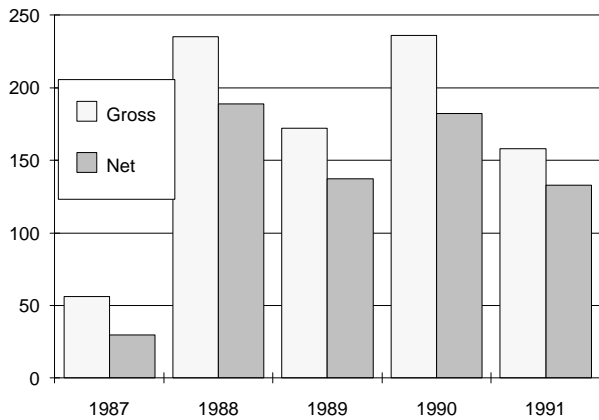
Note that the cost of saved energy may well be comparable with other profiles, since WE presents quite conservative "net" savings results.

Program Savings

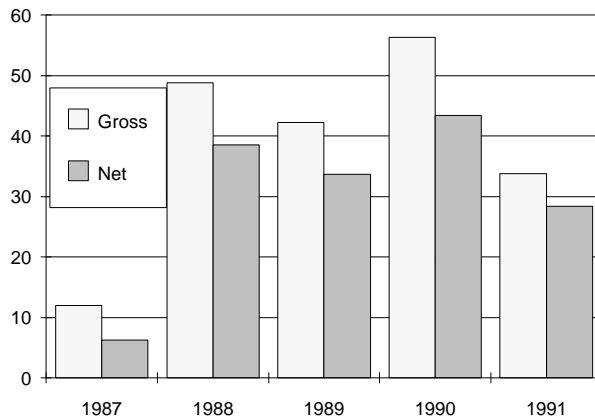
Savings Overview Table	Annual Energy Savings (MWh)	Cumulative Energy Savings (MWh)	Lifecycle Energy Savings (MWh)	Annual Capacity Savings (MW)	Cumulative Capacity Savings (MW)
1987	29,561	29,561	295,610	6.3	6.3
1988	188,676	218,237	1,886,760	38.5	44.8
1989	137,215	355,452	1,372,150	33.7	78.5
1990	182,264	537,716	1,822,640	43.4	121.9
1991	132,887	670,603	1,328,870	28.4	150.3
Total	670,603	1,811,569	6,706,030	150.3	

[R#2]

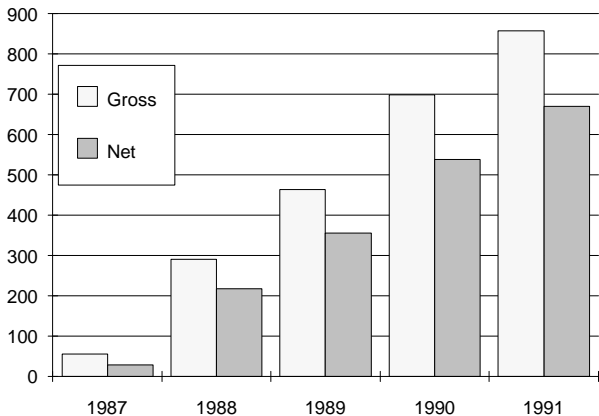
ANNUAL ENERGY SAVINGS (GWH)



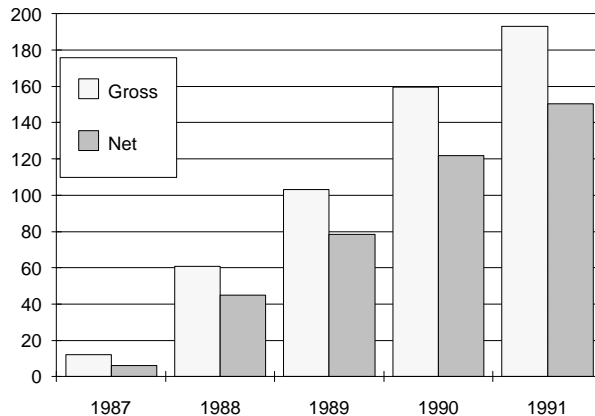
ANNUAL CAPACITY SAVINGS (MW)



CUMULATIVE ENERGY SAVINGS (GWH)



CUMULATIVE CAPACITY SAVINGS (MW)



In 1991 Smart Money for Business resulted in net demand savings of 28.4 MW and 132.9 GWh in annual energy savings. [R#2]. Between 1987 and 1991, the program has accumulated 670.6 GWh in annual energy savings, and 150.3 MW in annual peak capacity savings.

through the year 2000. With a 10-year average lifetime, the program will add 1,329 GWh in lifecycle savings each year, for an additional 11,961 GWh on top of the 6,706 GWh already accumulated. Thus, by the year 2000, the program will have generated 18,667 GWh in lifecycle savings.

PARTICIPATION RATES

The Commercial-Retail, Office and Farm (ROF) segment represents the largest percentage of program participants. The ROF market experienced steadily increasing participation through 1990, when participation jumped dramatically from 3,448 in 1989 to 11,106. This jump is partly attributable to the introduction of the Commercial Lighting Retrofit Program in 1990. Although participation declined in 1991 to 5,911 from the 1990 program high, it remained above the 1989 level. The number of annual participants in the Commercial-Lodging, Institution, and Food Service (LIFS) segment though only a small percentage of the total participant group, increased by more than 450% from 227 in 1987 to 1,037 in 1991. Likewise, Industrial participants have increased from 142 in 1987 to a high of 653 in 1990, with 599 participants in 1991. [R#2]

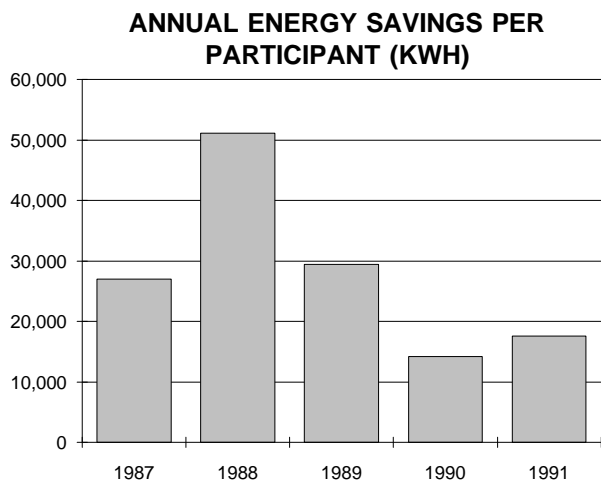
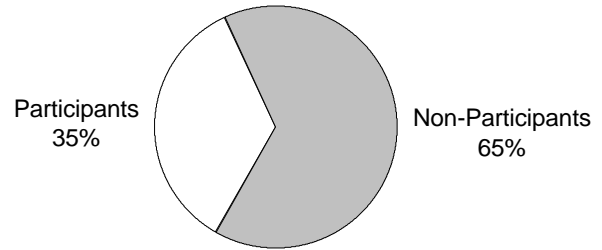
In 1991, Wisconsin Electric served 85,204 commercial and industrial customers, all of whom are eligible to participate in Smart Money for Business. With total participation between 1987 and 1991 at 29,770 customers, the program has reached almost 35% of the eligible customer base, assuming no repeat participants. Even if some customers participated in the program more than once, the program still has excellent participation rates.

MEASURE LIFETIME

The average weighted measure lifetime will vary in each year, depending upon the number and type of measures installed each year. Most measures installed have lifetimes between 2 and 15 years. With the majority of measures from lighting, a conservative estimate of average lifetime would be 10 years. [R#7] This figure is used in calculating lifecycle energy savings in the Savings Overview Table, and in determining the cost of saved energy shown in the Cost of the Program section.

PROJECTED SAVINGS

Lifecycle savings from projects implemented in 1991 were 1,329 GWh. The Results Center calculated projected savings assuming a constant participation rate each year



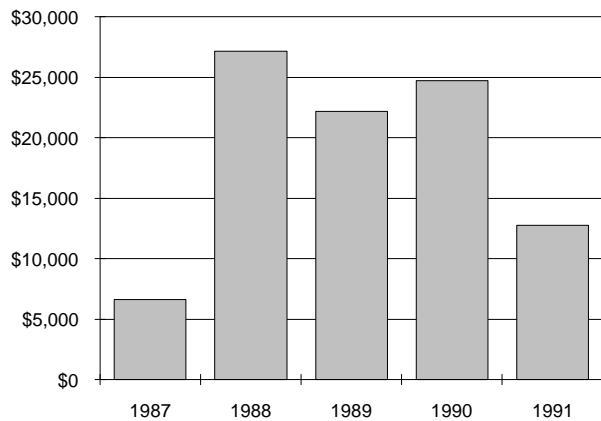
Savings Per Participant Table	Participants	Annual Energy Savings per Participant (kWh)
1987	1,094	27,021
1988	3,686	51,187
1989	4,656	29,471
1990	12,787	14,254
1991	7,547	17,608
Total	29,770	

Cost of the Program

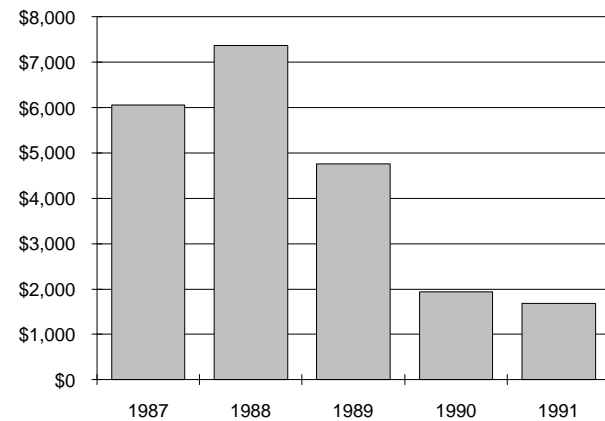
Costs Overview Table	Rebates (x1000)	Loans Cost (x1000)	Total Incentives Cost (x1000)	Average Incentive Cost per Participant
1987	\$5,635.3	\$982.6	\$6,617.8	\$6,049.21
1988	\$23,877.3	\$3,290.1	\$27,167.5	\$7,370.45
1989	\$16,062.4	\$6,107.1	\$22,169.5	\$4,761.48
1990	\$23,621.0	\$1,117.0	\$24,738.0	\$1,934.62
1991	\$12,701.0	\$47.9	\$12,748.9	\$1,689.27
Total	\$81,897.1	\$11,544.7	\$93,441.7	

[R#2]

TOTAL INCENTIVE COST (x1,000)



COST PER PARTICIPANT



Cost of Saved Energy Table (¢/kWh)	Discount Rates						
	3%	4%	5%	6%	7%	8%	9%
1987	2.62	2.76	2.90	3.04	3.19	3.34	3.49
1988	1.69	1.78	1.86	1.96	2.05	2.15	2.24
1989	1.89	1.99	2.09	2.20	2.30	2.41	2.52
1990	1.59	1.67	1.76	1.84	1.93	2.02	2.11
1991	1.12	1.18	1.24	1.30	1.37	1.43	1.49

In 1991 rebates and loans issued through the Smart Money for Business program totalled \$12.7 million. Between 1987 and 1991, the program has issued \$81.9 million in rebates, and \$11.5 million in loans for a total of \$93.4 million.

COST EFFECTIVENESS

Wisconsin Electric calculates net program benefits, defined as “the avoided cost of the measure savings adjusted for free riders, less rebates and program administration costs” in 1991 at \$24.7 million (in nominal dollars).[R#2]

The Results Center calculated cost of saved energy at various discount rates, based on the total rebate and loan amounts paid, and not including any administrative or evaluation costs. The cost of saved energy, based on a 10 year lifetime, ranged from 1.12 ¢/kWh to 1.49 ¢/kWh in 1991.

COST PER PARTICIPANT

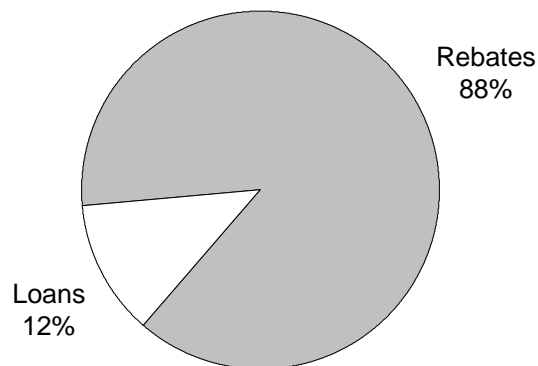
The Results Center calculated the average incentive per participant at \$6,050 in 1987. The average incentive cost peaked at \$7,400 in 1988, and then dropped each year to its 1991 low of \$1,700.

FREE RIDERSHIP

All savings reported by Wisconsin Electric have been adjusted for free ridership. The evaluation studies underway for the program will seek to quantify and assess free ridership in each component of the Smart Money for Business program. In 1991, most gross impacts were reduced by 13% to 17% for free-ridership. Free-riders are assumed to be lowest for participants in the farm equipment rebates, at about 8%. The highest free-ridership reductions in 1991 were for controls and water heating, at 26%.[R#2]

COST COMPONENTS

Rebates represent by far the greatest cost component in each year. In 1989, the loan component was at the highest percentage, at 27.5% of the total participant receipts. In 1991, loans, at \$47,900 out of \$12,749,000 represented only a tiny percentage of the annual rebate and loan costs.[R#2]



Environmental Benefit Statement

Marginal Power Plant	Heat Rate BTU/kWh	% Sulfur in Fuel	CO2 (lbs)	SO2 (lbs)	NOx (lbs)	TSP* (lbs)
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Coal Uncontrolled Emissions

A	9,400	2.50%	3,905,743,000	92,662,000	18,732,000	1,873,000
B	10,000	1.20%	4,164,797,000	35,869,000	12,096,000	8,967,000

Controlled Emissions

A	9,400	2.50%	3,905,743,000	9,266,000	18,732,000	150,000
B	10,000	1.20%	4,164,797,000	3,587,000	12,096,000	598,000
C	10,000		4,164,797,000	23,913,000	11,956,000	598,000

Atmospheric Fluidized Bed Combustion

A	10,000	1.10%	4,164,797,000	10,960,000	5,978,000	2,989,000
B	9,400	2.50%	3,905,743,000	9,266,000	7,493,000	562,000

Integrated Gasification Combined Cycle

A	10,000	0.45%	4,164,797,000	7,373,000	1,196,000	2,989,000
B	9,010		3,746,325,000	2,670,000	899,000	180,000

Gas Steam

A	10,400		2,271,708,000	0	5,181,000	0
B	9,224		1,972,799,000	0	12,355,000	584,000

Combined Cycle

1. Existing	9,000		1,972,799,000	0	7,572,000	0
2. NSPS*	9,000		1,972,799,000	0	3,587,000	0
3. BACT*	9,000		1,972,799,000	0	498,000	0

Oil Steam--#6 Oil

A	9,840	2.00%	3,287,998,000	49,818,000	5,879,000	5,580,000
B	10,400	2.20%	3,487,270,000	49,420,000	7,393,000	3,587,000
C	10,400	1.00%	3,487,270,000	7,054,000	5,938,000	1,873,000
D	10,400	0.50%	3,487,270,000	20,724,000	7,393,000	1,140,000

Combustion Turbine

#2 Diesel	13,600	0.30%	4,364,070,000	8,688,000	13,491,000	737,000
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Refuse Derived Fuel

Conventional	15,000	0.20%	5,181,087,000	13,351,000	17,576,000	3,906,000
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Avoided Emissions Based on 1,811,569,000kWh Saved (1987-1991)

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 previous page is to allow any user of this profile to apply Wisconsin Electric's level of avoided emissions saved through its Smart Money for Business 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 includes 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.

WISCONSIN ELECTRIC'S AVOIDED EMISSIONS

Wisconsin Electric estimates its avoided emissions for all of its DSM programs, using a coal plant as its marginal power plant. Between 1987 and 1991, WE estimates that the Smart Money Energy Program, including both business and residential components, can be credited with reducing sulfur dioxide emissions by 6,150 tons, nitrous oxide emissions by 2,150 tons, and carbon dioxide emissions by 971,854 tons.

* Acronyms used in the table

TSP = Total Suspended Particulates

NSPS = New Source Performance Standards

BACT = Best Available Control Technology

Lessons Learned / Transferability

LESSONS LEARNED

Smart Money for Business has evolved logically and positively in the years since its inception in 1987. The program has been thoroughly evaluated throughout its existence, and changes have been implemented as needed. The result has been a highly successful comprehensive program that meets the needs of a diverse customer group.

The willingness to evaluate the program and identify necessary changes is demonstrated by a variety of examples. Perhaps the most directly responsive change was the development and implementation of the Commercial Lighting Retrofit Program after a study revealed that small businesses were not participating in the Smart Money programs for which they were eligible. The program successfully introduced small businesses to the Wisconsin Electric energy-efficiency programs for which they were eligible.

When lower than desired participation in the motors component of the Smart Money for Business program was noted in 1990, Wisconsin Electric conducted a survey in an attempt to determine how participation could be improved. The survey of motor vendors, trade allies, contractors, and corporate managers indicated that customer awareness needed to be increased, and availability of qualifying motors needed to be improved. Motors tend to be replaced only after failure, and Wisconsin Electric recognized the unique opportunity to influence motor buyers during emergency replacement. Suggestions were made to stimulate supply of high-efficiency motors. Through the implementation of the Instant Motor Rebate offer, purchases of energy-efficient motors have increased significantly over past program participation levels. WE has also worked with motor dealers within the service territory to streamline the application process, making it easier for dealers to promote this offer, and facilitating dealer and customer participation.

After a review of the past database configuration revealed that changes would enhance WE's abilities for processing, tracking and evaluation purposes, Wisconsin Electric designed and implemented a new system. The new database, put on line in April, 1991, streamlines the program application and tracking process, prevents data errors, and can generate reports for use in evaluation activities.

Through Total Quality Management (TQM), the Demand Side Administration Group implemented many process simplification improvements for program operations, benefitting the primary users — sales representatives, and administrative staff. Payment processing procedures were simplified, reducing the number of delays and errors occurring before a rebate check is printed. Additionally, data collection and inspection procedures were standardized through the use of input sheets and system-generated completion forms, reducing data entry delays. With the assistance of TQM, program participation levels have significantly increased without requiring any additions to staff. [R#13]

A study of marketing materials in 1991 revealed that promotional pieces could be enhanced through some design changes. The recommended changes were implemented in 1992.

TRANSFERABILITY

Wisconsin Electric's Smart Money for Business has been highly successful in its service area, with a participation rate of approximately 35%. The program, offering rebates for products attractive to virtually every non-residential customer type, would be effective in other regions as well. Some of the measures eligible for rebates may not be applicable in other areas: farm equipment is not likely to be prevalent in an urban area, and air conditioning products may not be popular in a winter-peaking area.

Regulatory Incentives and Shareholder Returns

HISTORY OF IRP IN WISCONSIN

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. The Wisconsin Public Service Commission has tested a variety of shareholder incentives mechanisms with the four major utilities in the state since 1987. No shareholder incentive mechanism is active in the state at this time. [R#3,9]

State power plant siting law requires utilities to file advanced plans approximately every two or three years. The Integrated Resource Planning process is implemented in Wisconsin through these plans, which must include an analysis of alternative resources. 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. [R#3,8]

DSM COST RECOVERY

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#3,10]

DSM INCENTIVES AT WISCONSIN ELECTRIC

In 1986, the Commission ordered WE to scale up its investment in conservation activities beginning in 1987. The same order allowed the utility to capitalize the financial incentives it provided to customers for DSM since they were considered to have long-term benefits. These investments were allowed to earn the utility's current rate of return. At the same time the Commission instituted an incentive mechanism for WE that allowed the utility to earn an additional 1% return on unamortized portions of its conservation investments for each 125 MW of demand savings achieved through its conservation programs. This program was concluded in 1990. [R#3,8]

In 1989, the Commission staff asked the utilities to consider an Electric Revenue Adjustment Mechanism (ERAM) as an alternative incentive mechanism. The utilities rejected ERAM as a better alternative for Wisconsin because of its short term perspective and potential effects on large customers. No ERAM has been instituted in Wisconsin. [R#8]

WE requested a replacement incentive for the 1991 test year which tied the amount of stockholder incentive to the amount of net benefits the demand-side programs achieved. WE's main arguments were that the incentive would help to encourage and reward utilities for aggressive DSM efforts as well as protect the shareholders from loss of earnings potential associated with effective DSM. WE brought Eric Hirst of Oak Ridge National Laboratory in to testify on behalf of stockholder incentives. [R#8]

Regulatory Incentives (continued)

But, in a somewhat unusual turn and seemingly radical departure from national regulatory trends, Wisconsin's Public Service Commission moved away from providing incentives to utility stockholders and toward providing incentives, in the form of bonuses, directly to the utility staff that promote the installation of DSM measures. In WE's 1991 test year, the Commission directed that an employee incentive program for WE be instituted for utility employees (other than top management) considered to be instrumental in achieving demand-side benefits. These employees were eligible to earn incentive bonuses based on performance. The Commission granted the utility about a half a million dollars for employee incentives, versus the approximately \$5.5 million that WE had requested for utility shareholders. [R#3,8]

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. [R#10] Wisconsin has dropped stockholder incentives at least for the time being but not for a lack of effort. Wisconsin remains one of the most aggressive DSM states in terms of the percentage of gross revenues spent on DSM. The individual utilities and the Commission are still looking for a mechanism to encourage DSM efforts and agree upon a level of measurement that is acceptable to both utilities and intervenors. [R#8,10]

FUTURE DIRECTIONS IN WISCONSIN

In the current Advance Plan 6 order, 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 Commis-

sion presented a set of criteria, or guidelines, that utilities must meet to be eligible for the incentives. Wisconsin Public Service Corporation applied for a shareholder incentive in their 1993 test year rate case but one was not provided. [R#11,12]

Incentives are being considered for renewable energy developments, but that's in large part due to the fact that the state's utilities have declining amounts of renewables in their advance plans. Renewables, unlike DSM, can be metered, and thus the issue of verification is much more straight forward. [R#9,8]

Currently Wisconsin Electric is evaluating DSM incentives in light of the Commission's set of guidelines, and will make a determination whether to file for incentives in May of 1993 for the 1994 test year. [R#12]

References

1. Wisconsin Electric Power Company, "1991 Annual Report."
2. Wisconsin Electric Power Company, "1991 Annual Evaluation Report for Wisconsin Electric's Demand-Side Management Programs," March 1992.
3. Wisconsin Electric Power Company, "1990 Annual Evaluation Report for Wisconsin Electric's Demand-Side Management Programs," March 28, 1991.
4. Wisconsin Energy Corporation, "1991 Statistical Report."
5. Wisconsin Electric Power Company, Smart Money Rebate Guide (pocket booklet), 1991.
6. Smart Money for Business, various marketing brochures and pamphlets.
7. Tom Hawley, Industrial Market Manager, Retail Markets, Wisconsin Electric Power Company, personal communication, November, 1992.
8. Donna Conant, Supervisor, Program Evaluation, Wisconsin Electric Power Company, personal communication, November-December 1992.
9. National Association of Regulatory Utility Commissioners, "Incentives for Demand-Side Management", Committee on Energy Conservation, January 1992.
10. Paul Newman, Wisconsin Public Service Commission, personal communication, October 1992.
11. Shel Feldman, Executive Director, Wisconsin Center for Demand Side Research, personal communication, October 1992.
12. Dave Carlson, Manager, Customer Planning, Wisconsin Electric Power Company, personal communication, November 1992.
13. Kay Galbraith, Supervisor, Demand Side Administration, Wisconsin Electric Power Company, personal communication, December, 1992.

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