

---

# Sierra Pacific Power Company

## Peak Performance Program

### Profile #110

Executive Summary	2
Utility Overview	3
1993 Sierra Pacific Statistics	
Utility DSM Overview	4
SPPCo 1994 DSM Programs; DSM Overview; Annual DSM Expenditure; Annual Energy Savings; Annual Summer Capacity Savings	
Implementation	6
Peak Performance Program; Shared Savings Financing; Mining Customer Services; Marketing; Delivery: The Step By Step Process; Measures Installed; Staffing Requirements; Case Study: The Resort at Squaw Creek; Case Study: Large Industrial Gold Mine	
Monitoring and Evaluation	11
Program Savings	12
Participation Rates; Free Ridership; Measure Lifetime; Projected Savings; Participation; Savings Overview; Annual Energy Savings; Cumulative Energy Savings; Annual Peak Capacity Savings; Cumulative Peak Capacity Savings	
Cost of the Program	14
Cost Effectiveness; Cost Per Participant; Cost Components; Costs Overview; Cost of Saved Energy at Various Discount Rates;	
Environmental Benefit Statement	16
Lessons Learned / Transferability	18
Regulatory Incentives and Shareholder Returns	20
References	21

# Executive Summary

Sierra Pacific Power Company's Peak Performance program represents a program that has evolved over time addressing both the needs of the utility and its customers. The program's roots were typified by conventional incentives. Then in order to make the program more cost effective and to serve a greater number of customers in difficult-to-reach customer segments, the program began to more fully exploit the company's technical and engineering services while shifting a greater percentage of the resulting retrofits' costs to customers themselves. Financing was also added as a program option to alleviate participants' first-cost hurdles and to broaden the net of eligible customers. Now financing and customer capital appears poised to replace rebates as the basis for the program as the utility's cost effectiveness criteria have become more stringent and electric utility competition increases.

Key to the success of the program has been its engineering orientation. The Customer Technical Services Department which implements the program has fashioned the program in line with several other industry trends. Paramount to the program are monitoring and verification of savings. Staff work in close cooperation with a qualified network of engineering firms in the utility's service territory to identify savings potentials and to perform pre- and post-installation monitoring of customers' facilities. These trade allies have been critical to the program's implementation and have been instrumental in assuring that incentives are only paid for validated savings.

Another feature of Peak Performance is its focus on two intriguing customer segments. Since the demand for energy and capacity related to mining is Sierra Pacific's fastest growing load, Peak Performance works in close cooperation with Mining Customer Services to make this sector's use of electricity most productive and to serve these customers with enhanced energy services. Incentives have been provided for more efficient equipment, such as motors and pumps, and for process improvements such as gravity-feed water systems.

The gaming industry also presents unique challenges and opportunities for Peak Performance. While casinos and hotels are among the toughest customer segments to address with energy efficiency improvements, through sophisticated technical services Sierra Pacific has been able to make progress with decreasing overall energy consumption while maintaining or improving visitor amenities. Key to this success has been a recognition that these customers' unique needs are generally not financial but instead related to minimizing inconveniences related to energy efficiency while improving the overall productivity of staff and maximizing the gaming floor area and customer comfort. Sierra Pacific experts continue to use their creative and technical abilities to evaluate alternative advanced energy services for casinos — such as on-site generation and district cooling — to maximize the efficiency of their power use and to thus retain these customers which are clearly important to both the utility and the area's economic development.

## SIERRA PACIFIC POWER COMPANY Peak Performance Program

**Sector:** Large Commercial and Industrial

**Measures:** Any and all energy conservation measures for new construction or retrofits which produce verifiable savings in energy or peak demand

**Mechanism:** Rebates and shared savings financing are available to qualifying SPPCo customers as incentives to install energy-efficient measures

**History:** Peak Performance evolved from the Generic Rebate program which began in 1990

### 1994 PROGRAM DATA

Energy savings: 26,878 MWh  
Lifecycle energy savings: 403,170 MWh  
Capacity savings: 4.41 MW winter  
3.25 MW summer  
Cost: \$1,354,407

### CUMULATIVE DATA

Energy savings: 254,374 MWh  
Lifecycle energy savings: 1,900,224 MWh  
Capacity savings: 21.81 MW winter  
21.58 MW summer  
Costs: \$2,670,906

### 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.

# Utility Overview

Sierra Pacific Power Company (herein referred to as SPPCo or Sierra Pacific), a subsidiary of Sierra Pacific Resources, serves a 50,000 square mile region in northern Nevada and northeastern California. Headquartered in Reno, Nevada, SPPCo delivers electric service to over 250,000 customers, as well as natural gas to 85,000 and water service to 58,000 customers within the Reno area.[R#1,11]

Nevada is currently the fastest growing state in the country. SPPCo's customer base grew by 38% between 1983 and 1993 and is expected to expand another 26% in the next decade. Sierra Pacific has become a player in this trend by teaming its Economic Development Department with state and local marketing agencies to attract more commercial growth for the region. In fact, the Economic Development Authority of Western Nevada reported that in 1993, 52 companies committed to relocate to the Reno-Sparks area, including Lockheed and State Farm Insurance.[R#1]

Growth and increased resource demand from technological developments are strongly felt by SPPCo through its largest customers in the mining industry. (Gold mining alone accounted for 18.3% of SPPCo's electric sales revenues in 1993.) Likewise, the gaming and resort industries which dominate the Reno/Tahoe area also continue to grow. Their effect is further amplified by the unique climate of the Reno area. Reno experiences a temperature swing as great as forty degrees from day to night, the largest temperature difference in the country.[R#1]

Revenues for SPPCo have also grown quite dramatically. In 1993, revenues totaled \$475.9 million representing a ten percent increase from the previous year. Electric sales accounted for 82% of total operating revenue at \$390.3 million and totaled 6.5 million MWh, a gain of three percent from the previous year. The residential sector accounts for 25% of the utility's electricity sales, while commercial and industrial customers are responsible for 72% of the company's electricity sales.[R#1,11]

In addition to meeting the increased demands produced by growth, SPPCo is also focusing on becoming more competitive. In June of 1993, Nevada became the first state to legislate authorized discounts for energy purchases and limited retail wheeling. Measures to develop this competitive edge in response to the new shape of the industry include curtailing operating costs, streamlining staff, and focusing on marketing.

In order to meet the demand generated by growth and to simultaneously develop competitive tools for the future, SPPCo has begun construction of an interstate natural gas pipeline and an electric intertie to the Pacific Northwest to increase its

## 1993 SIERRA PACIFIC STATISTICS

<i>Number of Customers</i>	256,198
<i>Number of Employees</i>	1,800
<i>Electric Sales</i>	6,495 GWh
<i>Electric Sales Revenues</i>	\$390 million
<i>Peak Demand</i>	1,074 MW
<i>Generating Capacity</i>	1,325 MW
<i>Reserve Margin</i>	23 %
<b><u>Average Electric Rates</u></b>	
<i>Residential</i>	8.55 ¢/kWh
<i>Commercial</i>	6.96 ¢/kWh
<i>Industrial</i>	5.05 ¢/kWh

transmission capacity and service more customers. Approval has also been received from the Public Service Commission of Nevada for the construction of new facilities including a coal gasification plant and a combined-cycle turbine which will generate power using either natural gas or diesel fuel. These highly efficient plants will have relatively minor environmental impact and will contribute another 143 megawatts of summer peak power and 166 megawatts of winter peak power.[R#1]

Sierra Pacific is further preparing for a more competitive future through its upcoming merge with Washington Water Power Company (WWP). The resulting Resources West Energy will serve more than 520,000 electric, 270,000 natural gas, and 58,000 water customers across five states. This union connects WWP's access to cheap hydroelectric power with SPPCo's access to the California and Southwestern markets. By combining and streamlining corporate staff, expanding both customer base and generating capacity, both utilities will enjoy reduced costs and reserve capacity requirements, and increased buying and selling strength and diversity of generating resources. In conjunction with this strategic merge, Sierra Pacific has engaged a rate freeze. SPPCo has committed to the regulatory commission to hold its rates at the 1994 level until 1996. A goal has been set to maintain this rate freeze until the year 2000.[R#7,13]

Currently, SPPCo generates 26% of its power from coal, 23% from gas and oil, 11% from geothermal, and 1% from hydroelectricity. This makes Sierra Pacific the largest user of geothermal power by percentage of any utility in the nation. The remaining 39% of power is purchased from various sources. These resources provide a total generating capacity of 1,325 MW resulting in a reserve margin of 23% in 1993.[R#1]

# Utility DSM Overview

## **SPPCo 1994 DSM PROGRAMS**

### Residential

*Good Cents - New Home*

*Good Cents - Improved Home*

*Light Brigade*

*Direct Weatherization*

*Water Heater Wrap*

*Energy Partners*

*Energy Education*

### **Small/Medium Commercial/Industrial**

*Good Cents - New Commercial*

*Energy Advantage*

*Light Brigade*

*Special Incentives*

*Energy Education*

### **Large Commercial/Industrial**

***Peak Performance/Shared Savings***

*Interruptible Service*

Sierra Pacific began its demand-side management efforts in the late eighties with a fragmented collection of programs targeting specific technologies. Between the years of 1986 and 1989 a small battery of individual programs such as the Electric Water Heater Wrap program and the Comprehensive Lighting Efficiency program were piloted and implemented by SPPCo's Energy Services Department.

In 1990, the Sierra Pacific Power Company recognized the benefits derived from energy efficiency and made the commitment to develop a comprehensive portfolio of DSM programs. This entailed redesigning and improving the company's five existing programs and introducing new DSM programs which together would best serve the various needs of all the utility's customers. In their "1990-1992 Revised Demand-Side Plan," SPPCo outlined its new array of programs. In June of 1990 the plan was approved by the Public Service Commission of Nevada and by 1992 the intent of this plan was accomplished. In those three years, SPPCo's five existing DSM programs were revamped and seventeen new programs and services addressing residential and commercial/industrial customers were introduced.[R#3]

The 1990-1992 Revised Demand-Side Plan specified goals for

overall electric savings as well as both peak reductions for both summer and winter demands. (Given the unique climate of SPPCo's region, the utility experiences both summer and winter peaks in power demand.) The programs that resulted from the plan achieved 93% of their 13.8 MW savings goal for winter peak and met its summer peak goal of 13.5 MW. However, only 60% of the total projected energy savings of 86,747 MWh was realized for this period. This shortfall was primarily attributed to the lack of experience in calculating total energy savings achieved through these programs and new savings calculation methodologies for the next plan were carefully developed. On the other hand, the three-year plan was completed with total expenditures of \$9,125,826, only 75% of the budgeted amount.[R#3]

SPPCo followed its three-year plan with its "Five Year Demand-Side Plan: 1993-1997," which fine-tuned the company's DSM structure further. Of the 15 programs presented, eight were aimed towards the residential sector, five were designed for small to medium, commercial and industrial customers, while two programs were specifically dedicated to large commercial and industrial customers. This five-year plan established a goal for total winter capacity savings of 55.1 MW and 56.5 MW of summer peak savings. In addition, the plan called on its programs for a cumulative savings of 132,755 MWh between 1993 and 1997. The plan also encouraged the exploration of other potential DSM savings programs. The budget for this plan totalled \$31.6 million for the five-year period, equivalent to 1.35% of total electric revenues. To support the plan's objectives, the company dedicated an additional \$10 million for financing larger projects for SPPCo's programs through its Shared Savings program discussed later in this profile.

Performance for 1993, the first year of this plan's programs was overwhelmingly positive, achieving 204% and 217% of its summer and winter peak reduction goals respectively, and 416% of total energy savings goal. Furthermore, the program was again completed under budget using only 88% of projected expenditures. The strongest success was realized in the large commercial/industrial sector where fully 824% of its energy savings goal was achieved. Program savings for the residential sector, however, came in under target at 68% of expectations. As a result, the company's residential programs were scaled back and reevaluated during 1994.[R#2]

Change came to Sierra Pacific in the middle of 1994, with its decision to merge with Washington Water Power Company. With this new direction, the utility enacted a rate freeze which subsequently halted all rebate projects. SPPCo is currently in

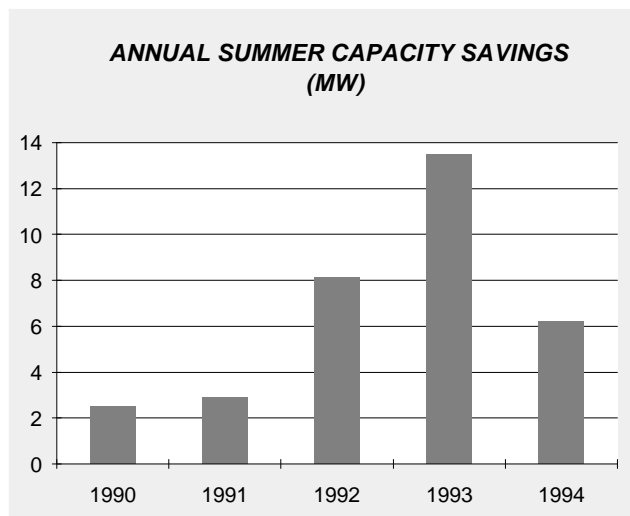
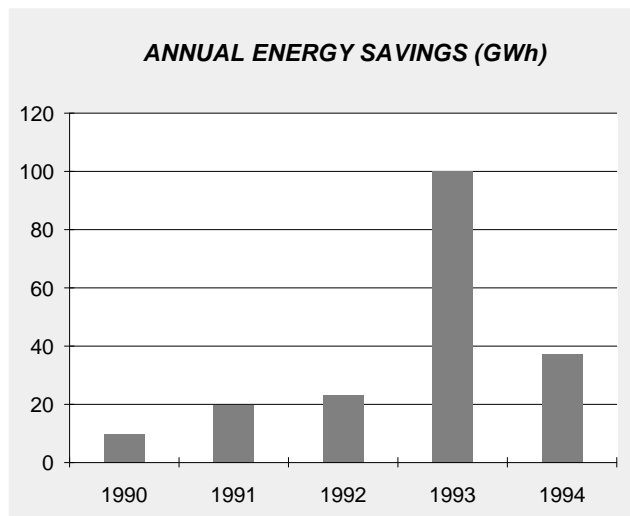
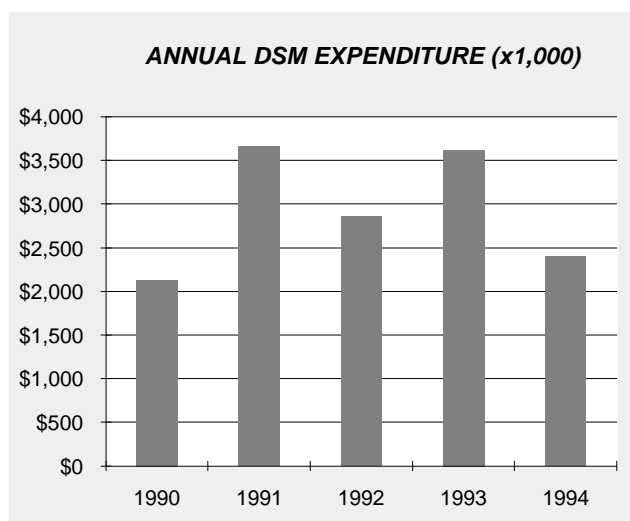
<b>DSM OVERVIEW</b>	<b>ANNUAL DSM EXPENDITURE (x1,000)</b>	<b>ANNUAL ENERGY SAVINGS (GWh)</b>	<b>ANNUAL SUMMER CAP.SAVINGS (MW)</b>
<b>1990</b>	\$2,130	9.67	2.50
<b>1991</b>	\$3,661	19.62	2.90
<b>1992</b>	\$2,856	23.16	8.10
<b>1993</b>	\$3,618	99.96	13.50
<b>1994</b>	\$2,401	37.84	6.19
<b>Total</b>	<b>\$14,666</b>	<b>190.25</b>	<b>33.19</b>

the process of remapping its DSM plan as a result of this upcoming partnership and restructuring for a more competitive utility market.

Clearly the greatest potential for DSM savings was found in SPPCo's largest customers. Addressing this potential were two of SPPCo's most successful DSM programs, the Light Brigade and Peak Performance accompanied by their Shared Savings financing program.

The Light Brigade was formerly called the Comprehensive Lighting Efficiency Program and was one of the first DSM programs implemented in 1987. The program provided financial incentives to commercial customers for installing energy-efficient lighting. It was revised over time to more adequately service its customers and operated in conjunction with SPPCo's Energy Advantage and Commercial Good Cents programs. In 1993, this program achieved a winter peak savings of 1,492 kW, a summer peak savings of 1,986 kW and a total energy savings of 7,125 MWh. All of these savings exceeded the programs 1993 goals.

Targeting the utility's large commercial/industrial and mining customers is SPPCo's Peak Performance program, the subject of this profile. This program provided incentives to participants for installing energy-efficient measures which achieve a verified decrease in demand and energy. Peak Performance worked in conjunction with Shared Savings in order to provide financing for those customers whose investment exceeded \$10,000 and was delivered to the mining customers through Mining Customer Services. Given the importance of the Peak Performance program it had been allocated about 30% of Sierra Pacific's total DSM budget.



# Implementation

---

Sierra Pacific's Peak Performance program evolved from an earlier DSM program, the Generic Rebate program, which was first implemented in June of 1990. The Generic Rebate program was originally designed to deliver energy-efficient measures to SPPCo's large commercial and industrial customers as an "umbrella" for the various programs the utility had previously attempted. Those programs included HVAC Maintenance, Automatic Condenser Brushes, Cooling with Condenser Water, Restaurant Heat Recovery, and Motor programs, most of which were too small and specialized to be cost-effective as stand-alone programs. By broadening the scope to include any and all energy savings and load reduction measures in this sector, the single program was not only easier to deliver to the customers but also easier and more cost-effective for the utility to administer. Through this revision, the Generic Rebate program was given the flexibility it needed to consider all of its customers for any efficiency measures on a case-by-case basis.

## PEAK PERFORMANCE PROGRAM

In April 1991, the Generic Rebate program was revised, improved, and renamed the Peak Performance program. The fundamental revision involved a new bidding process for selecting projects and issuing rebate dollars. Previously, projects installed through the program were accepted in the order in which they were submitted. This caused a situation in which all rebate dollars were expended early in the year bringing the program to a screeching halt and discouraging potential program participants. With Peak Performance, the customer bids a rebate amount when applying for the program. Through this competitive bidding structure Peak Performance enables the utility to select those projects which are most cost effective and therefore create the best possible return on investment for shareholder's money. This also allowed the program funds to be more judiciously expended, spreading the program's implementation throughout the year. The bidding process has reduced the amount paid in rebates by over 25% from the total rebate cost of implementing on a first-come, first-serve basis. Bidded applications are considered on an ongoing basis and rebate amounts are negotiable. Also, as the emphasis of this program has shifted from energy savings to capacity savings, selection favors projects targeting winter and/or summer peak demand reductions.

## SHARED SAVINGS FINANCING

To assist those customers who require a large initial investment to meet the criteria of Peak Performance, SPPCo added a second financing element to the program when Shared Savings was introduced in 1992. This financing mechanism was designed to complement Peak Performance and other DSM programs such as Light Brigade by providing customers needing funding in excess of \$10,000 with 100% financing in addition to project management and quality control. The customer in return, agrees to repay the loans for program installations over a five, seven or ten-year period at 13% interest. These loan payments, made in the form of a utility service charge, are only a portion of the energy costs savings which the customer earns through the project installation. Thus the savings are "shared" between the customer and SPPCo. Furthermore, Peak Performance incentives are used to buy-down the payback period so that the loan terms can be met. Shared Savings enables many of SPPCo's major accounts, who face capital barriers to implementation of energy-efficient measures, to participate in Peak Performance and other DSM programs. The total cost of the Shared Savings discount for the customers is approximately 10% of SPPCo's avoided costs. SPPCo currently uses its own capital to finance and construct these projects, however financial institutions will be the primary resource in the future.[R#3]

## MINING CUSTOMER SERVICES

While the majority of SPPCo customers which participate in Peak Performance come from the commercial and industrial sectors, another customer segment of significance to both the utility and the program is the mining sector. A component of Peak Performance that addresses this large segment of the market in which SPPCo is particularly interested is Mining Customer Services. This program was designed in 1990 to specifically address this large and growing segment of the market and its unique needs in terms of energy efficiency and improved productivity. In 1993, it was incorporated into Peak Performance as a vehicle for delivering efficiency services to this sector.

Mining is a major contributor to growth in Sierra Pacific's territory and accounted for 23% of sales in 1993, up from 19% in

---

1990. As new technologies are being applied in order to extract ore from greater depths the demand required by these customers continues to increase. In fact, mining is expected to represent at least 25% of all sales by the mid-1990s. Demand from the mining sector for pumping water from deeper pits, for example, is expected to increase from its current level of 30 MW to 75 MW in 1996. Thus Mining Customer Services works in conjunction with Peak Performance as well as other DSM programs, such as Interruptible Service, to better serve this class of customers' efficiency needs.[R#3]

## MARKETING

The Generic Rebate program used no advertising in 1990 because the entire program budget was allocated for customer incentives early in the year. With the addition of a bidding structure to Peak Performance, advertising was determined necessary in order to increase the number of projects which would then be selectively chosen for the rebate program. Thus in 1991 Peak Performance included the use of advertising through direct mailings followed up by visits from account representatives. At this time participation in the program is primarily solicited by account representatives for SPPCo's major accounts.

One of SPPCo's unique challenges is promoting energy efficiency in the gaming industry. For the hotels and casinos where gambling takes place, energy efficiency is generally neither an issue nor a particular interest. Remarkably, for many of these customers, any investment with longer than a six-month payback is not worth considering. Instead, the focus of the gaming industry is placed on revenues and other customer considerations to maximize revenues. However, by combining rebates from Peak Performance and available financing through Shared Savings, the concept of implementing energy reduction measures in existing and new developments becomes more appealing. Coupling these financial incentives has effectively elicited participation from less interested customers in the hotel/casino market. Key to program success in the gaming industry is an awareness of these customers' unique needs and constraints. Staff believe that any success with casinos will be predicated on maximizing floor area and reducing maintenance demands that would otherwise draw attention away from the gaming industries lifeblood: a dramatic flow of cash from visitors' pocketbooks.[R#7,13]

## DELIVERY: THE STEP BY STEP PROCESS

### **First, the customer must develop an energy savings analysis plan:**

Those large commercial and industrial customers interested in participating in SPPCo's Peak Performance must first develop a plan to install energy-efficient measures in either existing facilities or new construction. Engineers from SPPCo's Customer Technical Services Division are available to work with the customer and assist them with designing a plan and proposal.

### **The plan must be supported by engineering analysis:**

The plan must be accompanied by an analysis of the electrical and capacity savings potential expected through improved efficiency measures. This analysis must be performed by a registered professional engineer. (SPPCo maintains a list of eligible contractors that it provides to interested customers.)

### **The customer then must assess program eligibility:**

To be eligible for a rebate the verifiable savings must be accomplished through a system modification or physical implementation which can be measured, not through energy education.

The program's peak load reduction criteria are as follows: In order to be eligible for a rebate the measures installed must result in a reduction of a 3-5 hour load during winter peak demand period between 5:00 pm and 10:00 pm during the months of November through March and/or a reduction of an 8-12 hour load during the summer peak demand period between 10:00 am and 10:00 pm during the months of June through September. Proof of reduction of one or both of these loads or an overall reduction of electrical consumption is necessary in order to be considered for the program.

Customers who would be considered ineligible include those whose construction is already underway; those receiving incentives from any other of SPPCo's programs; and those suggesting measures which will compromise the comfort level of the building's occupants.[R#4,12]

### **The customer then determines the rebate amount to bid:**

Providing that program eligibility has been established, the customer must then decide upon a rebate amount to bid. To help customers determine appropriate bids, sample rebate

## Implementation (continued)

---

calculations based on Sierra Pacific's avoided costs are supplied. Rebate payments are generally tied to project payback periods. SPPCo ties its rebates through payback buy-downs to a maximum ten-year payback; for projects that result in peak period demand savings the rebates can be even larger. The customer uses these guidelines to determine what rebate amount toward the project's cost should be requested.

Although there are variations to every customer's contract, all rebates are subject to the following guidelines: 1. The rebate cannot exceed 75% of total or incremental cost. 2. For equipment which reduces demand and is expected to last at least ten years, the rebate would be \$30 for every kW saved during summer peak, \$30 for every kW saved during winter peaks and \$20 on every MWh saved. 3. For equipment expected to last at least ten years which and does not reduce demand, the rebate is \$5 for every MWh saved in energy. 4. For equipment with an average measure life under ten years, the rebate is reduced in proportion with the above guidelines.

### STAGE 2: APPLICATION

**The customer then submits an application stating proposed energy efficiency measures, projected savings, and the bidded rebate amount to Sierra Pacific Power Company:** The application is accompanied by the energy analysis prepared by a Registered Professional Engineer which describes in detail the proposed efficiency measures and projected savings.

**Sierra Pacific staff then assess the application and determine whether to provide the customer with a financial incentive:** Applications are reviewed and prioritized according to their projected savings and requested rebates. An answer, indicating approval or recommending further project modifications, is given to the customer within five working days. Upon approval of an application, a contract between the customer and Sierra Pacific, outlining the rebate and its payment criteria is negotiated and signed.[R#3]

**Determining baseline energy use is necessary to verify the projects savings:** In compliance with SPPCo's "Engineering Verification Manual", participation in Peak Performance requires careful monitoring of energy use both before and after implementation of proposed measure. Again a Registered Professional Engineer must provide stamped and signed documentation regarding the energy savings of the project which is necessary for project auditing.

Pre-installation monitoring of existing facilities may be necessary to determine end-use patterns. (Every contract in the Peak Performance program includes a stipulation that the facility may be required to undergo up to a ninety day pre-installation monitoring period.) For new construction, projections based on standard construction regulations from computer modeling can determine overall energy use. Load and energy calculations are documented in the First Engineering Report. Once SPPCo reviews the calculations to ensure that they comply with verification standards, project construction begins.

**Post-installation monitoring is required to verify achieved savings:** After the installation or construction has been completed and is operating and fine-tuned, post-installation monitoring of the project is required to establish end-use patterns. (Similar to the pre-installation requirement, every contract in the Peak Performance program includes a stipulation that the facility may be required to undergo up to a ninety day pre-installation monitoring period.) This data is then compiled in a Final Engineering Report stating the actual achieved savings in comparison to the estimated savings. Appropriate documentation is a requirement for SPPCo's verification protocol.

**After approval of the Final Engineering Report payment of the rebate is issued:** All rebates are subject to modification based on the difference between actual and projected savings as specified in the contract. Thus, if a customer's achieved savings are significantly smaller than projected, the rebate may be reduced. Likewise, it may be increased up to 10% if a greater than estimated savings is reported.



---

## MEASURES INSTALLED

A variety of energy efficiency measures have been installed through the Peak Performance program. Sample projects include replacing aired cooled rooftop air conditioning units with central water cooled, high efficiency units equipped with economizers on a Reno office building; installing motorized dampers to control draft on an elevator shaft to prevent loss of conditioned air from a Reno hotel/casino; installing window film on a Reno Hilton; replacing fourteen 500 horsepower booster pumps used for pumping water uphill with a gravity feeding piping system requiring no uphill pumping at a gold mine; load shifting at an industrial precious metals factory; and replacing three air-cooled reciprocal chillers which supplied process cooling water with a “free cooling” system consisting of a water cooled cooling tower, flat plate and frame heat exchanger and pumps.

Peak Performance has also worked with both the Reno government and school district in becoming more efficient. By installing an energy management system to control HVAC equipment at five buildings for the government, an estimated 423 kW and 774,000 kWh was saved. On/off controls were installed on 43, 6 kW electric heaters that are connected to existing energy management systems at eight elementary schools, saving an estimated 340 kW. An additional 187 kW and 653,000 kWh were saved by installing direct digital controls to an energy management system, variable frequency drives, and high efficiency motors at a Carson City high school to improve the efficiency of both the HVAC and lighting systems there.

## STAFFING REQUIREMENTS

Peak Performance is administered by the Energy Services Division of SPPCo. The Program Administration section of this Department handles all regulatory and internal management tracking, including reporting for DSM programs handled by Energy Services, and assists account representatives in tracking

systems and verifying the energy and demand savings. Executing the administrative tasks of Peak Performance requires five employees working approximately half time on this program.

Paul Hamilton manages a staff of five engineers in the Customer Technical Services (CTS) Department which works half-time on the program. At the core of the program, CTS provides engineering support in terms of energy analysis and project recommendations regarding rebates and technical verification of energy savings, and plays a major role in evaluation of performance for existing programs.

Account Representatives are responsible for coordinating customers with the Customer Technical Services staff members. There are six directors handling SPPCo’s “major accounts” and an additional nine customer account managers who serve as contacts for the program.

---

### **CASE STUDY: THE RESORT AT SQUAW CREEK**

The Resort at Squaw Creek, located in Olympic Valley, California, is a full-service resort in SPPCo's service area which took advantage of the financial incentives offered through Peak Performance. By modifying its existing chilled water and facility-wide energy management systems (EMS) the project exceeded its predicted total energy savings and met its demand savings.

A Reno-based engineering firm conducted the energy analysis for the retrofit measures and all pre- and post-installation monitoring. Their projected winter peak savings of 238 kW and annual energy savings of 1.732 GWh creating annual cash savings of \$93,550, earned a rebate offer of \$60,000 from SPPCo. The project's costs were estimated at \$247,197 for a net cost of \$187,197 with the rebate. Payback period for this project was estimated at 2 years.

The mechanical systems modification was performed in two phases. Phase I was implemented in October of 1993 and consisted of modifications to the chilled water system. The resultant savings were greater than predicted, both for demand reduction and energy consumption, achieving a winter demand reduction of 430.9 kW and energy savings of 2.33 GWh for a total savings of \$125,792. Phase II of the project, which involved the conversion of 13 EMS systems, took place in 1994. Predicted demand reductions were in close range to the actual reductions of 182.91 kW and 178.24 kW for summer and winter peaks respectively. Annual savings in energy and dollars exceeded their projected amounts by 63% for a total of 1.75 GWh producing \$103,222 in savings for the resort.

### **CASE STUDY: LARGE INDUSTRIAL GOLD MINE**

A project completed through Peak Performance on a large gold mining operation was successful in reducing its 80 MW load by over 7,500 kW. Since the pumps operate continuously on a 24-hour basis, demand savings from this project alone account for nearly a 1% reduction in SPPCo's overall system load. The project involved replacing fourteen 500 horsepower booster pumps that had been used for pumping water from the watertable out of pits and over a 400-foot hill to a wastewater pond with a more efficient design. In their place a gravity-feed piping was installed which required no uphill pumping and which was capable of funnelling 70,000 gallons per minute to the mine. Savings of 62.706 GWh with a demand reduction of 7,535 kW were estimated for the project. Thus the project, which cost the mine a total of nearly \$8 million, was eligible for a rebate of \$189,000. From the utility's perspective since the project resulted in a load reduction of nearly 8 MW, the rebate represents a payment to the customer of only 5% of avoided costs (for a cost of about \$25/kW) while typical rebate programs around the country have paid nearly ten times as much, underscoring the importance of the technical services aspect of the Peak Performance program.

# Monitoring and Evaluation

---

## MONITORING

Success of the Peak Performance program is based on verifiable energy savings. Consistent, accurate monitoring is essential in order to appropriately evaluate each project for its savings potential. For this reason, the structure of the program contains specifications for savings verification of the project. These specifications are outlined in Sierra Pacific's "Engineering Verification Manual". Compliance with this protocol requires that all energy analyses and monitoring performed on the facility be conducted, stamped, and signed by a Nevada Registered Professional Engineer so that savings are verified through consistent methods.

Selection of a project for Peak Performance requires load and energy savings as per the ASHRAE Handbook of Fundamentals Load and Energy Calculations and methodology of verification as per ASHRAE Applications, Chapter 37. Similarly, for lighting retrofits, all lighting levels recommended for a project and subsequent verification monitoring must meet Illuminating Engineering Society (IES) lighting standards. Additional pre-installation metering of the facility may be required to establish baseline measurements against which post-installation metering will be compared to verify load reduction and energy savings. Allowance for a ninety-day, pre-installation monitoring period is required for all projects. For those projects involving new construction, energy savings are based on what standard design electric loads would be. This data is documented in the First Engineering Report which includes details on the project's background, energy savings calculations, method of verification, schedule and maintenance agreement. [R#4]

Post-installation monitoring occurs during the three-month verification period following completion of the project. Once operations of the project are fine-tuned, end-use metering is conducted to establish the modified load shape and energy consumption. Findings of this study are stated in the Final Engineering Report which includes any additional background on

the project, measured savings and their comparison to projected savings, method of verification, actual project schedule maintenance agreement and equipment involved. This report must contain the same format as the First Engineering Report and must be completed to the satisfaction of the utility in order for a rebate to be issued. Subsequent metering and maintenance inspections are then handled by account representatives.

## EVALUATION

An estimated forty percent of all capacity and energy savings realized by SPPCo's portfolio of DSM programs is projected to be achieved by Peak Performance. For this reason, this program receives a great amount of evaluation focus.

Sierra Pacific hired RLW Analytics to evaluate its Peak Performance/Shared Savings program. RLW conducted an investigation of the impacts and processes of these programs through on-site visits of completed and current projects, surveys with customers and staff, and a review of the tracking and verification systems. RLW also conducted extensive monitoring of ten of Peak Performance's project sites. All sites were monitored for demand and total load data was collected at 15-minute intervals. This information was used to independently determine peak demand for each facility for pre- and post-installation operations. These estimates were then compared to Peak Performance's estimates to help determine accuracy of the engineers' estimating methods.

Conclusions of the multi-year study conducted by RLW were outlined in a 1993 evaluation report. Findings from RLW's impact analysis of the program revealed a realization rate 103.6% for demand savings and 106.2% for energy savings, indicating that the program's engineering estimates were a good projection of the actual savings. Persistence of project savings was found to 100% while free ridership was determined to negligible. Implications from RLW's process analysis confirmed a high level of customer satisfaction but a low level market awareness for the program. [R#8]

# Program Savings

Peak Performance achieved a total energy savings of 26.9 GWh in 1994, with winter and summer capacity savings of 4.41 MW and 3.25 MW respectively. Annual energy savings achieved through Peak Performance reached their highest level in 1993, totaling 82.4 GWh with a winter peak capacity savings of 10.6 MW and a summer peak capacity savings of 9.9 MW. Annual energy savings from the years 1990-1994 totaled 126.682 GWh with winter and summer peak demand savings for the four years equaling 21.81 MW and 21.58 MW respectively. The dramatic increases in both energy and capacity savings in 1993 and 1994 were the result of increased participation and the targeting and selection of larger projects, resulting in larger savings and greater program “bang for the buck.” The tremendous spike which occurs for the 1993 data is the consequence of one particularly successful project which resulted in the elimination of a year round 24 hour pump operation. (Please see “Case Study: Large Industrial Gold Mine”).

## PARTICIPATION RATES

In 1990 eight participants saved an average of 172.6 MWh and an average of 465 kW and 436 kW of winter and summer demand respectively. Again, in 1993 the program experienced a huge increase in participation and overall savings, as savings per participant jumped by nearly a factor of twenty to an average savings per participant of 3.2 GWh with an average capacity savings of 408 kW and 380 kW of winter and summer demand respectively. This dramatic jump in savings reflects SPPCo’s strategy of targeting only very large projects in 1993. Participation continued to grow in 1994, when 34 of the numerous applications were granted contracts before the program was halted in June of 1994. SPPCo has been meeting and will fulfill its commitments to customers in the remainder of 1994 and in 1995. Savings of nearly a gigawatt per participant were achieved for 1994.

## FREE RIDERSHIP

Since implementation of projects for this program involve such high initial costs, Sierra Pacific assumes that the level of program free ridership is quite low if existent at all. Staff suggest that most measures installed were not ones that necessarily needed to be implemented at that time and thus would not have been implemented without Peak Performance’s incentive. On the other hand, given the relatively small portion of project costs provided by Sierra Pacific, and thus the correspondingly large customer payment, it is possible that some customers were ready to invest the full project costs and were catalyzed into action by SPPCo’s incentives, implying a degree of free ridership that has not been calculated by utility staff.

## MEASURE LIFETIME

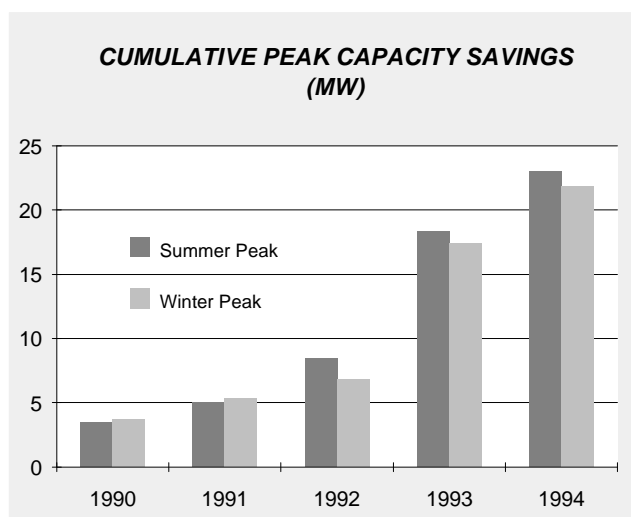
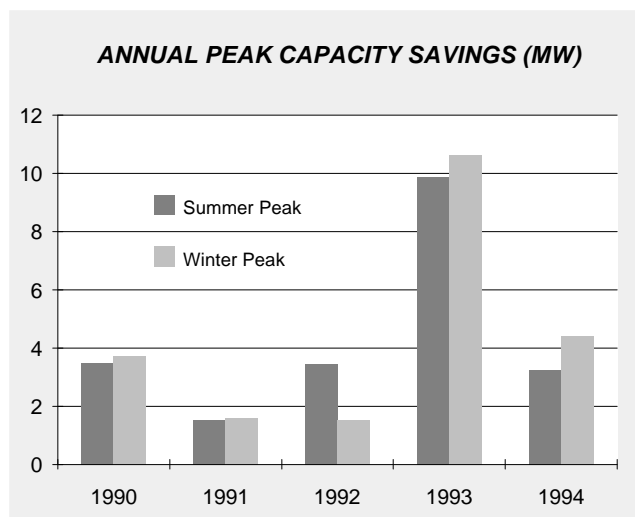
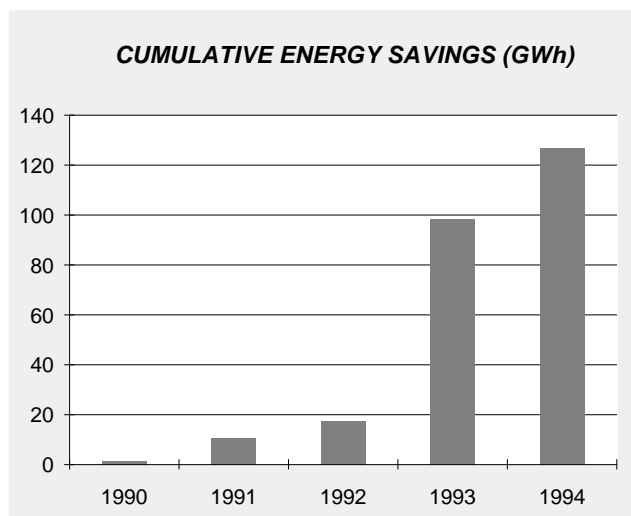
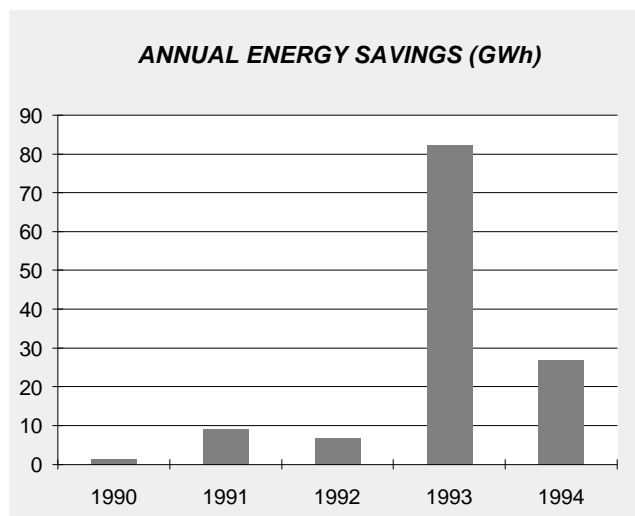
Given the broad range and characteristics of measures installed, determining an average measure lifetime is quite difficult and problematic. Since most measures installed have been large pieces of equipment and energy management systems – versus simple lighting retrofits that characterize many large commercial and industrial programs – Sierra Pacific staff assume a fifteen-year lifetime for measures installed.[R#3,4]

## PROJECTED SAVINGS

The Peak Performance program was able to exceed its 1993 savings goal for winter and summer peak reductions by 267% and 247% respectively as well as energy savings by 824%. Sierra Pacific’s “Five Year Plan” projects a five year total savings from 1993-1997 of 20,000 kW for winter and summer peaks and 50,000 MWh in energy savings, representing projected lifecycle energy savings of 750,000 MWh. By 1993 these capacity goals had been nearly accomplished and the energy savings goal had already been eclipsed.

<b>PARTICIPATION</b>	<b>NUMBER OF PARTICIPANTS</b>	<b>ANNUAL ENERGY SAVINGS PER PARTICIPANT (MWh)</b>	<b>ANNUAL WINTER DEMAND SAVINGS PER PARTICIPANT (kW)</b>	<b>ANNUAL SUMMER DEMAND SAVINGS PER PARTICIPANT (kW)</b>
<b>1990</b>	8	173	465	436
<b>1991</b>	13	701	122	117
<b>1992</b>	17	406	88	202
<b>1993</b>	26	3,169	408	380
<b>1994</b>	34	791	130	96
<b>Total</b>	98			

SAVINGS OVERVIEW	ANNUAL ENERGY SAVINGS (MWh)	CUMULATIVE ENERGY SAVINGS (MWh)	LIFECYCLE ENERGY SAVINGS (MWh)	ANNUAL WINTER PEAK CAPACITY SAVINGS (MW)	ANNUAL SUMMER PEAK CAPACITY SAVINGS (MW)	CUMULATIVE WINTER PEAK CAPACITY SAVINGS (MW)	CUMULATIVE SUMMER PEAK CAPACITY SAVINGS (MW)
<b>1990</b>	1,381	1,381	20,715	3.72	3.49	3.72	3.49
<b>1991</b>	9,108	10,489	136,626	1.58	1.52	5.30	5.01
<b>1992</b>	6,910	17,400	103,654	1.50	3.43	6.80	8.44
<b>1993</b>	82,404	98,423	1,236,060	10.60	9.89	17.40	18.33
<b>1994</b>	26,878	126,682	403,170	4.41	3.25	21.81	21.58
<b>Total</b>	126,682	254,374	1,900,224	21.81	21.58		



# Cost of the Program

Sierra Pacific has spent a total of \$2.7 million on Peak Performance and its prior Generic Rebate programs since 1990. The program has been dramatically ramped up, beginning with an annual expenditure of \$170,055 in 1990, then increasing by a factor of three to \$597,184 in 1991, to down slightly to \$522,427 in 1992, until it experienced its greatest jump in expenditure to \$1,381,240 in 1993. In 1994, \$1,663,123 was spent on the program before it was halted in the middle of the year.

## COST EFFECTIVENESS

Sierra Pacific reported in 1992 that the benefit/cost ratio for Peak Performance was 1.10 using the total resource cost test with a net present value of \$2,287. This ranked Peak Performance third in order of Dollar Contribution to total resource net present value.[R#3]

The cost of saved energy for Peak Performance have varied dramatically as well but have been remarkably low, a testa-

Savings into the program and Peak Performance high level of success in achieving energy savings. While the costs of saved energy over tripled in 1994, it still resides at a relatively low increment, ranging from 0.42¢/kWh to 0.63¢/kWh.

## COST PER PARTICIPANT

The average cost per participant in 1990 was \$21,257. This figure rose by nearly 150% in 1993, to an average of \$53,125 per participant, an minor increase when contrasted to the 680% increase in savings per participant for that year. In 1994, cost per participant equalled \$47,518.

## COST COMPONENTS

Rebate dollars accounted for some 97% of the total program costs for the Generic Rebate program in its first year, 1990. This trend was repeated in the following year. The proportion of rebate dollars to total costs dropped significantly to 82% in

<i><b>COSTS OVERVIEW</b></i>	<i><b>ADMINISTRATION AND OVERHEAD</b></i>	<i><b>LABOR</b></i>	<i><b>INCENTIVES AND MEASURES</b></i>	<i><b>TOTAL PROGRAM COST</b></i>	<i><b>COST PER PARTICIPANT</b></i>
<b>1990</b>	\$1,334	\$3,200	\$165,521	\$170,055	\$21,257
<b>1991</b>	\$2,897	\$9,100	\$585,187	\$597,184	\$45,937
<b>1992</b>	\$27,512	\$65,504	\$429,411	\$522,427	\$30,731
<b>1993</b>	\$135,915	\$202,858	\$1,042,467	\$1,381,240	\$53,125
<b>1994</b>	\$335,223	\$500,320	\$827,580	\$1,663,123	\$47,518
<b>Total</b>	\$167,658	\$280,662	\$2,222,586	\$2,670,906	

ment to the program design. In 1990, the cost of saved energy ranged from 1.03¢/kWh to 1.53¢/kWh. In 1993, the year representing the greatest program maturity, the cost of saved energy dropped to between 0.14¢/kWh to 0.21¢/kWh depending on the discount range used. This high level of cost-effectiveness in 1993 resulted both from the incorporation of Shared

1992 when the first full year of the restructured program as Peak Performance was completed. In 1993, the total cost for the Peak Performance program was \$1.4 million with rebates awarded through the program accounting for three-fourths of the total cost representing a shift in costs toward marketing and providing technical services. Another factor involved with

<b>COST OF SAVED ENERGY AT VARIOUS DISCOUNT RATES (¢/kWh)</b>	<b>3%</b>	<b>4%</b>	<b>5%</b>	<b>6%</b>	<b>7%</b>	<b>8%</b>	<b>9%</b>
<b>1990</b>	1.03	1.11	1.19	1.27	1.35	1.44	1.53
<b>1991</b>	0.55	0.59	0.63	0.68	0.72	0.77	0.81
<b>1992</b>	0.63	0.68	0.73	0.78	0.83	0.88	0.94
<b>1993</b>	0.14	0.15	0.16	0.17	0.18	0.20	0.21
<b>1994</b>	0.42	0.45	0.49	0.52	0.55	0.59	0.63

the more advanced program design was the more careful allocation of incentives such that the program was able to serve highly cost effective projects throughout the year through the rebate bidding procedure.

Cost components for 1994 changed dramatically, with over twice the expenditure on administration as the previous year, while the incentive costs dropped. This leap in administrative costs was caused by the tremendous growth in interest in the program and increased involvement from the account representatives. Success from the previous year sparked an increase in application for 1994. While this increased level of activity drove up administrative costs in the first half of 1994, much of the corresponding rebates were never allocated since the program was put on hold in June. While incentives for accepted projects were honored, there were many applications which

added to the preliminary administrative costs which never made it to the rebate contract stage because of the discontinuance of rebate programs at SPPCo. This explains the uneven skew in the costs allocation.

Labor costs account for engineering consultation provided by SPPCo's Customer Technical Services department and services provided by the account representatives. Administration costs include all administrative and overhead costs for the program. Measures and Incentives consist primarily of rebate dollars awarded for measures installed. A small portion however, is attributed to materials and equipments, such as meters. This percent is considered negligible. Evaluation of the program is accounted for separately by SPPCo and is not represented in this table. [R#14]

# Environmental Benefit Statement

<b>AVOIDED EMISSIONS: Based on 254,374,000 kWh saved</b>						
<b>Marginal Power Plant</b>	<b>Heat Rate BTU/kWh</b>	<b>% Sulfur in Fuel</b>	<b>CO2 (lbs)</b>	<b>SO2 (lbs)</b>	<b>NOx (lbs)</b>	<b>TSP* (lbs)</b>
<b>Coal Uncontrolled Emissions</b>						
A	9,400	2.50%	548,430,000	13,011,000	2,630,000	263,000
B	10,000	1.20%	584,806,000	5,037,000	1,698,000	1,259,000
<b>Controlled Emissions</b>						
A	9,400	2.50%	548,430,000	1,301,000	2,630,000	21,000
B	10,000	1.20%	584,806,000	504,000	1,698,000	84,000
C	10,000		584,806,000	3,358,000	1,679,000	84,000
<b>Atmospheric Fluidized Bed Combustion</b>						
A	10,000	1.10%	584,806,000	1,539,000	839,000	420,000
B	9,400	2.50%	548,430,000	1,301,000	1,052,000	79,000
<b>Integrated Gasification Combined Cycle</b>						
A	10,000	0.45%	584,806,000	1,035,000	168,000	420,000
B	9,010		526,045,000	375,000	126,000	25,000
<b>Gas Steam</b>						
A	10,400		318,985,000	0	728,000	0
B	9,224		277,013,000	0	1,735,000	82,000
<b>Combined Cycle</b>						
1. Existing	9,000		277,013,000	0	1,063,000	0
2. NSPS*	9,000		277,013,000	0	504,000	0
3. BACT*	9,000		277,013,000	0	70,000	0
<b>Oil Steam--#6 Oil</b>						
A	9,840	2.00%	461,689,000	6,995,000	825,000	783,000
B	10,400	2.20%	489,670,000	6,939,000	1,038,000	504,000
C	10,400	1.00%	489,670,000	991,000	834,000	263,000
D	10,400	0.50%	489,670,000	2,910,000	1,038,000	160,000
<b>Combustion Turbine</b>						
#2 Diesel	13,600	0.30%	612,787,000	1,220,000	1,894,000	104,000
<b>Refuse Derived Fuel</b>						
Conventional	15,000	0.20%	727,510,000	1,875,000	2,468,000	548,000



---

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 Sierra Pacific Power Company's level of avoided emissions saved through its Peak Performance 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 / Transferability

---

## LESSONS LEARNED

Sierra Pacific's Peak Performance program is the product of an evolution of demand-side plans targeting the large commercial and industrial customer, the sector where the potential for savings is generally the greatest. The program underwent two major revisions as the utility learned how to more successfully service its customers while simultaneously lowering program costs and achieving greater savings for the company. In this process, SPPCo realized several aspects necessary in developing a more effective program.

**Restructuring its DSM program to reward any efficiency measure through a Generic Rebate program allowed Sierra Pacific to solicit more customers cost effectively:** The Generic Rebate program was piloted in 1988, as a method for streamlining SPPCo's existing DSM programs targeting the commercial/industrial sector. Prior to its introduction, efficiency measures were being delivered to the customer through a series of smaller programs, addressing specific energy conservation measures such as HVAC maintenance or cooling with condenser water. This method of delivering measures separately could not support the expense of individual program budgets and was sometimes difficult to quantify in terms of savings.[R#6]

By collecting these services under one umbrella program, SPPCo created a cost-effective vehicle for delivering any and all possible energy efficiency measures to its customers. The Generic Rebate program enabled the customer to install whatever measures would achieve improved efficiency and work directly with SPPCo's engineers in identifying those measures. By focusing on rewarding savings instead of installing specific measures, customer participation increased. At the same time, the utility was able to achieve greater savings more cost effectively.

**Introducing competitive bidding for awarding rebates has enabled Sierra Pacific to select those projects which are most cost-effective:** In 1990, Sierra Pacific estimated that it would provide program incentives equivalent to 24% of its avoided cost. This level was used to establish a budget for the program. These incentive levels suggested that the budget was insufficient in offsetting the high retrofit costs. Inversely, the calculation method for customer rebates awarded in 1990, based on a two-year payback was generating an average rebate of over 50% of avoided costs. These inconsistencies in calculating the budgeted and awarded incentives were considered disastrous for program. The Generic Rebate program had allocated its entire rebate budget early in the year

but met only 30% of its goal for 1990 due to poor allocation of incentive dollars.

The following year, the Generic Rebate program was revised and Peak Performance introduced a competitive bidding mechanism to the program. Under this structure, projects are selected on their cost-effectiveness rather than on a first-come, first-serve basis giving SPPCo the opportunity to maximize its energy savings from its investments. By establishing a competitive bidding structure the utility can select from any of the applications which have been submitted on an ongoing basis and prioritize these projects according to peak reductions, energy savings, and rebate costs. This has enabled Peak Performance to exceed its energy savings and demand reduction goals while reducing its average rebate paid from 57% of avoided cost to around 30%.[R#3]

**Providing a financing mechanism through Shared Savings has made large-scale retrofitting economically feasible for Sierra Pacific's major accounts:** Additional financial assistance was determined necessary in order to make retrofit and new construction measures accessible to some of SPPCo's larger commercial and industrial customers. For those customers who found lack of available capital a roadblock to implementing the recommended measures, SPPCo incorporated Shared Savings into Peak Performance. This type of financing mechanism provides a win-win situation by generating positive cash flow for customers through achieved savings and cost effective savings for the utility since its program costs are a fraction of its avoided costs. This structure will undoubtedly become increasingly important in the future of the industry.

**Peak Performance emphasizes a large customer sector through Mining Customer Services:** In order to better service their mining customers with energy efficiency Peak Performance now works in conjunction with Mining Customer Services. Because of the tremendous impact that new technologies have had on these mining customers' operating costs in terms of electricity consumption, they are willing participants in these programs and ideal participants for DSM programs. The collaboration of Peak Performance and Mining Customer Services assists in activating this focus and facilitating communications between the mining customer and SPPCo's Customer Technical Services. Mining Customer Services acts as an excellent vehicle for delivering DSM programs such as Peak Performance.

**Verification of all measures implemented through Peak Performance is vital to the program's success:** The

---

inclusion of pre- and post-installation monitoring for all projects provides accurate measurements of load reductions and electrical savings for evaluating the program. Accurate measurements of load cycles and energy use prior to the installation of conservation measures are necessary to determine the projected savings on which the selection of projects is based. Required verification of these savings after installation also determines the rebate payment and holds the customer accountable for achieving the savings projected while properly operating and maintaining equipment installed.

Development of an "Engineering Verification Manual" outlined specific, consistent methodologies for measurements taken for each project submitted. This ensures SPPCo that consistent data is collected for evaluation of Peak Performance projects. Additionally, it provides data for tracking achieved savings for the program to be used for evaluation of the DSM program and projections for future planning. SPPCo's requirement of a savings verification in compliance with a published protocol for all projects also serves to strengthen the credibility of the program to its customers, engineers, contractors, vendors, as well as internally for senior management.

**Success of the program depends on a good relationship with area engineering firms:** Selection of projects for the program is based on the projected savings submitted by engineers which may be contracted by the customer. In order to communicate more successfully with these trade allies, SPPCo has held conferences for local engineering firms explaining the program and offering technical assistance as required.

**The most challenging customer segment involved in the program has been the gaming industry, an important industry that requires special attention for program participation:** The hotel/casino operator's focus is strictly geared toward its customers and its revenue. Cash flows in this industry are very high and projects which realize a payback longer than six months are often not considered. Why put money into energy-efficient measures which have a two-year payback period when slot machines can pay for themselves in about six months? Thus, energy efficiency generally has little bearing on decisions made by gaming facility managers. Interviews conducted by RLW Analytics, however, revealed that the rebate offered by Peak Performance was successful in getting a Reno hotel/casino to install some conservation measures which would not have happened otherwise. [R#7]

Sierra Pacific staff suggest that in order to successfully evoke participation from this sector the utility may have to address

these customers' needs head on using a healthy dose of creativity! For instance, large casinos have tremendous electricity and thermal energy requirements making them potentially ideal sites for cogeneration. On the other hand, casinos are loathe to the notion of relinquishing any floor space for additional mechanical equipment, and would much rather not have to devote staff attention to operation power plants on site.

Thus as load growth continues within its service territory, and markets for electricity become more competitive, Sierra Pacific may find it in the mutual interests of the utility and its gaming customers to service these customers with non-polluting combined cycle natural gas fired cogeneration plants located nearby the casinos. While operated by Sierra Pacific, they would become the hosts for the electrical and thermal needs of the casinos, providing lower-cost power, space conditioning, and water heating while potentially eradicating or at least alleviating casinos' concerns about CFC phase-outs. New options for satisfying customers needs are evaluated on a continuous basis.

Through creative problem solving, and taking full advantage of Sierra Pacific's advanced technical services division, Sierra Pacific may be able to enhance efficiency within its service territory – even in the hardest to reach customer segment it has – while providing sophisticated energy services at lower costs thereby retaining important loads for the utility's profitability.

## TRANSFERABILITY

Sierra Pacific's Peak Performance program has proven highly successful in winter and summer peak load reduction, achieving overall energy savings, minimizing expenditures as a percentage of avoided costs, and providing customer satisfaction. By gearing efficiency measures towards its largest customers through a competitive bidding process the utility creates the opportunity to achieve its greatest savings potential at a competitive cost. This structure could be effectively applied to other utilities and has received attention and interest from other utility companies as well accolades from major trade associations such as the Electric Power Research Institute and the Edison Electric Institute. [R#3]

Within the company, as Sierra Pacific reshapes for the future, the elements which have made Peak Performance a successful program will continue to have a presence in developing programs. These key ingredients include a strong Customer Technical Services Department, a good relationship with area engineering firms, effectively meeting the customers' individual needs, and the experience gained through the program's successful track record, all of which have helped to deliver customer satisfaction. [R#13]

# Regulatory Incentives & Shareholder Returns

---

Traditional utility ratemaking practices, where each and every kilowatt-hour sold provides profit, is a major barrier to utilities' implementation of energy efficiency programs. Several state regulatory commissions and their investor-owned utilities have been pioneers in reforming ratemaking to a) remove the disincentives in utility investment in DSM programs and lost revenues associated with these programs, and b) to provide direct and pronounced incentives so that every marginal dollar spent on DSM provides a more attractive return than the same dollar spent on supply-side resources.

The purpose of this section is to briefly present innovative incentive ratemaking mechanisms where they've been applied. This we trust, will not only provide some understanding to the reader of the context within which the DSM program profiled herein is implemented, but the series of these sections will hopefully provide useful snapshots of incentive mechanisms being used and tested across the United States.

In 1984 the State of Nevada instituted rules related to integrated resource planning. Every three years each gas and electric utility in Nevada must submit an integrated resource plan outlining both supply and demand-side resource additions. While utilities must quantify the environmental costs and benefits of each option, in practice these values are not currently considered as criteria for resource selection.[R#18,19]

Beginning in 1989 the Nevada Public Service Commission developed rules designed to remove regulatory disincentives for utility DSM expenditures. The Nevada Public Service Commission (PSC or Commission) has considered a range of options including DSM program cost recovery, carrying charges on DSM program expenditures, lost revenue adjustments, and shareholder incentives even through means such as statistical recoupling. The Commission's most recent order was adopted in May of 1993 and is now part of the Nevada Administrative Code. At that time the Commission found that it lacks the statutory authority to enact incentive mechanisms such as statistical recoupling and lost revenue adjustments, but did pass a temporary regulation that covers program cost recovery as well as performance-based rewards and penalties for shareholder incentives for DSM capital investments. [R#18,19]

Currently Sierra Pacific Power can ratebase its DSM program costs for programs that provide quantifiable savings to the utility. (Other "service" programs, such as educational programs and awareness building campaigns are expensed.) Carrying charges, essentially interest on these expenditures and similar to AFUDC (allowance for funds used during construction), are also provided and are set at the company's authorized overall rate of return until the time of the next rate case. At that time DSM program costs that have accrued, plus interest on these costs, are recovered through rate adjustments. The costs of most utility DSM activities are allocated to all customers via a uniform cents/kWh charge and for Sierra Pacific's programs are amortized over ten years. While lost revenues have been considered by the PSC, currently there is no lost revenue mechanism in place in Nevada.[R#18,19]

The Commission has also instituted means for shareholders to earn a 500-basis point (5%) bonus above the company's authorized rate of return on common equity for preapproved and cost-effective DSM investments. A penalty provision is also included in Nevada's regulation. If a utility spends more than 110% or less than 90% of the preapproved DSM budget, a penalty of 5% of the difference between 90% or 110% and the amount of dollars actually spent is applied. The penalty provision is independent of the incentive provision above. Thus if a utility's authorized DSM budget was \$100 million, and it spent \$120 million, it would earn the authorized return plus the 5% bonus on \$110 million, while being penalized 5% of the authorized return on the \$10 million overage. Similarly if the same utility spent \$80 million, rather than the preapproved \$100 million, it would receive the authorized return plus 5% on the \$80 million while also paying a penalty equivalent to a 5% penalty on the authorized return for the \$10 million expenditure shortfall.[R#18,19]

While shareholder incentives are allowed for Sierra Pacific's DSM programs, the Commission stipulated that these costs must be rolled back into DSM program costs. By doing so, shareholder incentives have been internalized into the cost of DSM programs, even to the extent that the full costs of DSM programs (including shareholder incentives) must be considered when determining the benefit/cost of DSM programs during the initial screening and program selection process. [R#18,19]

# References

---

1. "1993 Annual Report", Sierra Pacific Resources.
2. "Demand-Side Plan Performance Update", Sierra Pacific Power Company, Second Quarter 1994, Fourth Quarter 1990, 1991, 1992, 1993.
3. "1993 Electric Resource Plan 1993-2011: Demand-Side Plan", Sierra Pacific Power Company, April 1, 1993.
4. "1992 Electric Resource Plan 1992-2011: Demand-Side Plan", Sierra Pacific Power Company, June, 1992.
5. "Peak Performance and Shared Savings", Sierra Pacific Power Company, undated.
6. "1989-2008 Electric Resource Plan: Demand-Side Plan", Sierra Pacific Power Company, July 1, 1989.
7. "Washington Water Power, Sierra Pacific Agree to Combination; See Major Cost Savings, More Competitive Position," Washington Water Power, Sierra Pacific Resources, June 28, 1994.
8. "Peak Performance, Shared Savings, and Mining Customer Services Program: 1993 Impact and Process Evaluation Report", RLW Analytics, Inc., Jan. 18, 1994.
9. "Peak Performance Report", Sierra Pacific Power Company, October 1994.
10. "Major Accounts/Customer Technical Services", Sierra Pacific Power Company, undated.
11. "Customer Services and Company Facts 1994", Sierra Pacific Power Company, undated.
12. "Introducing the Peak Performance Program: A Partnership In Energy Management", Sierra Pacific Power Company, undated.
13. Paul Hamilton, Manager, Customer Technical Services, Marketing Department, Sierra Pacific Power, personal communication, November 1994 - February 1995.
14. Alan Kass, Energy Services, Sierra Pacific Power, personal Communication, February 1995.
15. "Final Report on the 1994 Energy Retrofit for the Resort at Squaw Creek," Gardner Engineering, Inc., October 1994.
16. "Final Report on the 1993 Energy Retrofit for the Resort at Squaw Creek," Gardner Engineering, Inc., December 1993.
17. Matt Baker, Energy Services and Planning Support, Sierra Pacific Power, personal communication, November 1994 - February 1995.
18. Tom Henderson, Senior Analyst, Nevada Public Service Commission, personal communication, May 1995.
19. The National Association of Regulatory Utility Commissioners, "Incentives for Demand-Side Management," Second Edition, prepared by Barakat & Chamberlin, March 1993.

Special thanks to Paul Hamilton for this guidance and assistance throughout the development of this profile.