
Southern California Edison CFB and CFL Manufacturers' Rebates Profile #113

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Executive Summary

Utilities have learned that moving rebates upstream, from the consumer to the vendor, is a cost-effective means of promoting energy efficiency. Southern California Edison has demonstrated the success of this model in its Compact Fluorescent Bulb program, which gives the incentive to the manufacturer, creating two pronounced benefits. First, by requiring that the manufacturer pass along the unit savings downstream, a \$5 incentive becomes far greater when it reaches the consumer. (Consumer discounts can reach as high as \$15 with a \$5 manufacturer's rebate.) Second, by allocating wholesale rebates to a large quantity of lamps from manufacturers, utilities can stipulate performance criteria, such as maximum levels of harmonic distortion and minimum efficiency levels. Manufacturers' rebate programs can create financial leverage while transforming the market for energy-efficient products.

Another feature of the CFB program design is its three-fold ability to work with manufacturers to achieve even greater cost savings and performance improvements, each of which will further stimulate market transformation. First, since the utility rebates CFLs in bulk, manufacturers have been keen to participate in the program, and have even contributed to further lower the cost of the lamps. Second, by establishing a bidding and scoring system, Edison has been able to push manufacturers to produce products with quite specific and improved performance characteristics. Third, the program has been able to reward manufacturers with strong and established distribution channels (for instance, in large retail chains). Edison's contracts with participating manufacturers included a prerequisite number of units to be sold within an allotted timeframe. If this quota was not met, SCE reallocated the funds to other manufacturers who could deliver, market, and sell the lamps. Points were also awarded to manufacturers based on the degree to which they would commit to help market the lamps, often through cooperative arrangements with retailers.

Included in the program's design is a self monitoring component which cuts the administrative responsibilities of the utility and obligates the manufacturers to meet sales commitments. Verification of completed sales was required in the form of purchase orders and shipping documentation before manufacturers are reimbursed for their rebates. This confirmed that the pre-set sales agreements had been met and tracked the movement of units for SCE.

SCE's manufacturer's rebate program is a proven method of achieving high penetration and market transformation at lower costs in an easily transferable design. Their residential CFB program succeeded in moving over 2 million lamps with administrative costs running only 10% of the program's total costs, increasing the products' distribution by eight-fold. A similar success was experienced when SCE applied the model to their commercial customers and to other efficiency technologies. Currently, this same model is being considered by utilities across the country and on a nation-wide scale.

SOUTHERN CALIFORNIA EDISON CFB and CFL Manufacturers' Rebates

Sector: Residential, Commercial
Measures: Compact fluorescent lamps
Mechanism: Rebates awarded to CFL manufacturers on a per unit basis to reduce the wholesale price of lamps, creating a "downstream" price reduction at the retail level
History: Residential CFB program piloted in 1991 and implemented full-scale in 1992; commercial CFL program piloted in 1993 and implemented full-scale in 1994; both programs cancelled in 1995

RESIDENTIAL PROGRAM DATA (1992-1994)

Total annual savings: 101,057 MWh
Total cumulative savings: 202,114 MWh
Total lifecycle savings: 656,871 MWh
Total peak capacity savings: 1,531 kW
Total cost: \$10,108,834

COMMERCIAL PROGRAM DATA (1993-1994)

Total Annual Savings: 118,979 MWh
Total Cumulative Savings: 237,958 MWh
Total lifecycle savings: 773,365 MWh
Total peak capacity savings: 34,760 kW
Total cost: \$4,316,595

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

SCEcorp, with assets of more than \$22 billion, is the parent corporation of Southern California Edison Company and three non-utility subsidiaries collectively known as The Mission Companies. The Mission Companies include Mission Energy Company, one of the nation's largest non-utility power producers, Mission First Financial, and Mission Land Company. Southern California Edison Company (SCE or Edison), the largest SCEcorp subsidiary with nearly 16,400 employees, is the nation's second largest electric utility based on number of customers. The 109-year old investor-owned utility serves more than 4.1 million customers in central and southern California. Its service territory covers 50,000 square miles and is home to more than 11 million people.[R#1]

In 1994, SCE generated 77,986 GWh and had gross operating revenues of \$7.8 billion, over \$7.6 billion of which represents electricity sales. SCE electricity sales to commercial, industrial, and residential customers make up 82.7% of total kilowatt-hour sales. The balance is dispersed between public authorities, agriculture, and resale. Commercial customers purchased 27,954 GWh in 1994, comprising 35.8% of the total kWh sales and 37.4% of the operating revenue from electricity sales. Residential customers purchased 22,858 GWh in 1994, comprising 29.3% of electricity sold and 36.1% of the revenue; industrial customers purchased 13,706 GWh comprising 17.6% of electricity sales and 12.9% of the revenue for that period. Between September 1993 and September 1994 revenues increased in all customer classes. Earnings rose by 5.4% and actual electricity sales increased 6.4%.[R#1]

SCE has taken great pride in its diverse resource mix. Some 10 power supplies comprise their unique amalgam. Of SCE's own generation, 26% is gas-fired; 20% is nuclear; 13% is coal; 4% hydro; while 37% of the energy for the utility's total sales is purchased from other utilities and other power producers. These sources provide SCE with a peak generating capacity of 20,615 MW, a peak power demand of 18,044 MW, creating a reserve margin of 14.2% in 1994.[R#1]

SCE has taken a leadership role to support Southern California's pressing economic and environmental agenda. SCE faces the challenge of meeting customers' needs in a regional economy marked by prolonged recession in the face of a rapidly changing business market. SCEcorp has focused considerable attention on retaining its large commercial and industrial customers, as many consider leaving the service territory or installing their own electric generating systems mainly due to the high cost of air-quality compliance mandated by

SCE 1994 STATISTICS

<i>Number of Customers</i>	4.15	<i>million</i>
<i>Number of Employees</i>	16,351	
<i>Electricity Sales Revenue</i>	\$7.6	<i>billion</i>
<i>Electricity Sales</i>	77,986	<i>GWh</i>
<i>Summer Peak Demand</i>	18,044	<i>MW</i>
<i>Generating Capacity</i>	20,615	<i>MW</i>
<i>Reserve Margin</i>	14.20	<i>%</i>
<i>Average Electric Rate</i>	10	<i>¢/kWh</i>

the California Clean Air Act. In 1993, the South Coast Air Quality Management District adopted the nation's first comprehensive regional program for trading emissions credits. The Regional Clean Air Incentive Market program (RECLAIM), a market-based approach strongly supported by SCE, is designed to give large and small companies more flexibility in reducing their costs of compliance with increasingly strict air-quality standards. With an annual company-wide limit on nitrogen-oxides emissions, SCE is fulfilling its environmental responsibilities by using the least-cost combination of buying emission credits and installing new controls.[R#1]

For 1995, SCEcorp is focusing on restructuring for the future. A competitive edge has become imperative in SCE's market with the 1994 CPUC industry restructuring proposal which called for allowing large C&I customers direct access to competing generation providers by 1996 and for residential customers by 2002. While this dramatic form of restructuring is far from accomplished, SCE has already taken significant steps towards becoming more competitive by lowering its operating and maintenance (O&M) costs by 9% while expanding its net revenue by nearly 30% in 1994. Likewise, SCE has hired a new marketing officer with experience in the telecommunications industry which has undergone the deregulation revolution. Emphasis on partnerships and customer services has moved to the foreground with programs such as ENVEST – a new element of SCE which forms an alliance between the utility, customers, and energy service companies to lower customer costs, increase utility competitiveness and earn a profit for the shareholders. Finally, SCE has presented the CPUC with a proposal calling for performance-based ratemaking and the creation of a power pool, not unlike England's or other deregulated markets. The CPUC's decision on SCE's proposal is expected later this year.[R#1]

Utility DSM Overview

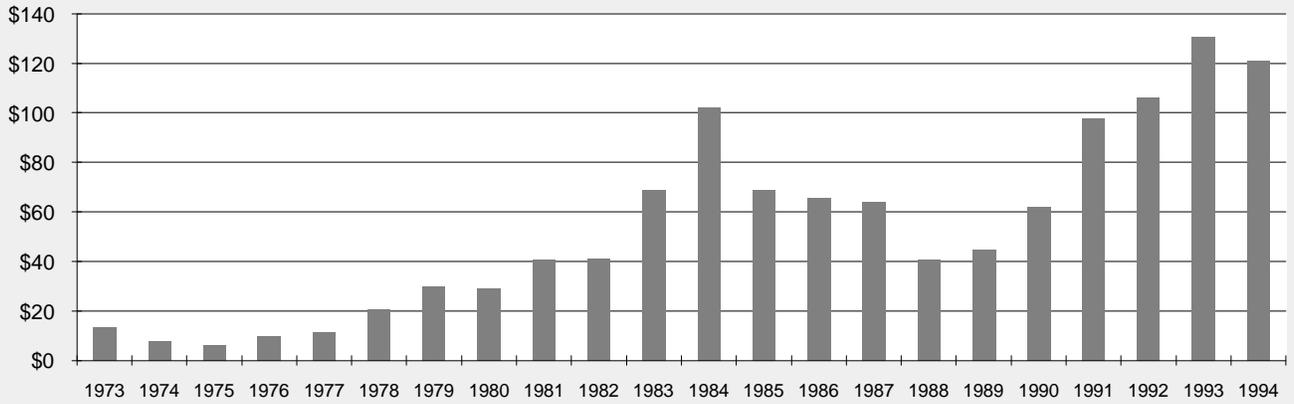
For two decades Southern California Edison has been one of the nation's leading utilities in demand-side management. SCE has offered DSM programs since the mid-seventies and has pioneered in many areas, paying particular attention to data collection and evaluation. After sharing the national leadership for energy efficiency with Pacific Gas & Electric in the

SCE 1994 DSM PROGRAMS
<u>Residential</u>
<i>Energy Management Services</i>
<i>Action Line</i>
<i>Rate Communication</i>
<i>Conservation Financing Program</i>
<i>Residential Energy Management Incentives</i>
<i>Low-Income Customer Assistance</i>
<i>Residential Energy Surveys</i>
Compact Fluorescent Bulb Campaign
<i>Super Efficient Refrigerator</i>
<i>California Home Energy Rating System</i>
<i>Appliance Rebate</i>
<i>Water Heater Blankets</i>
<i>Low Flow Shower Heads</i>
<i>Water-Energy Conservation Partnership</i>
<i>Appliance Efficiency Incentives</i>
<i>New Construction</i>
<i>Direct Assistance</i>
<u>Nonresidential</u>
<i>Rate Communication</i>
<i>Outreach</i>
<i>Commercial/Industrial/Agricultural Audits</i>
<i>Energy Management Hardware Rebate Program</i>
Compact Fluorescent Lamp Program
<i>Air Conditioner Inspection and Maintenance</i>
<i>Energy Efficient Motors Pilot</i>
<i>Design For Excellence</i>
<i>Commercial and Industrial Bidding Pilot</i>
<u>Other</u>
<i>Customer Technology Application Center</i>
<i>Energy Efficiency Rate Structure</i>
<i>Trees Forever</i>

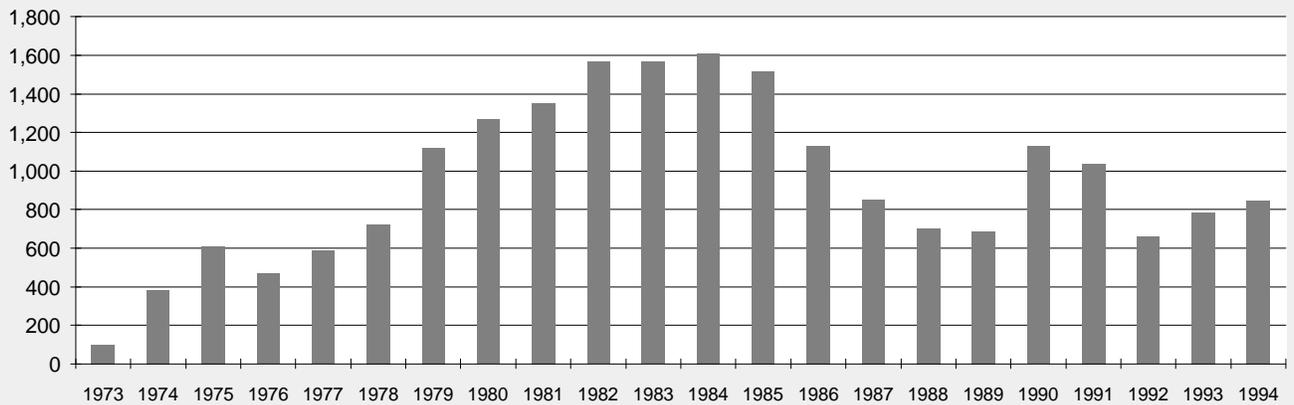
DSM OVERVIEW	DSM EXPENDITURE (x1000)	ENERGY SAVINGS (GWh)	CAPACITY SAVINGS (MW)
1973	\$13,541	96	10
1974	\$7,953	383	29
1975	\$6,316	609	100
1976	\$9,877	467	80
1977	\$11,215	586	101
1978	\$20,447	720	184
1979	\$29,705	1,121	308
1980	\$28,868	1,267	377
1981	\$40,835	1,351	616
1982	\$40,903	1,565	835
1983	\$68,762	1,568	848
1984	\$102,019	1,610	505
1985	\$68,630	1,518	489
1986	\$65,708	1,131	602
1987	\$63,969	849	445
1988	\$40,768	700	360
1989	\$44,568	683	268
1990	\$62,000	1,129	591
1991	\$97,708	1,039	514
1992	\$106,143	658	246
1993	\$130,700	783	317
1994	\$121,089	848	180
Total	\$1,181,724	20,681	8,005

late 1970s through the mid 1980s, SCE, like PG&E, sharply reduced its DSM expenditures in the late 1980s, citing excess capacity as the reason. SCE was able to rekindle its DSM leadership and increase its DSM spending starting in 1990 thanks to the influence of the California Collaborative, a working group of utilities, efficiency advocates, and other parties devoted to establishing profitable means for utilities to promote efficiency. [R#2]

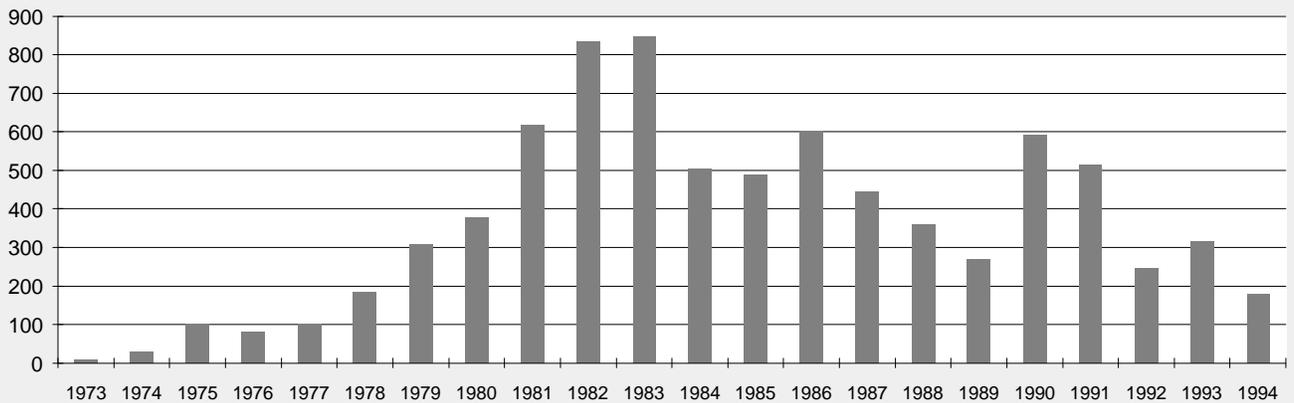
ANNUAL DSM EXPENDITURE (x1000)



ANNUAL ENERGY SAVINGS (GWh)



ANNUAL CAPACITY SAVINGS (MW)



Utility DSM Overview (continued)

While the California Collaborative provided the impetus for increased attention to energy efficiency, it also addressed the critical issue of shareholder profitability. Incentive mechanisms were established during the collaborative process and implemented in 1990. These incentives provided adjustments for lost revenue and allowed expenditures for resource-providing conservation programs to be amortized with shareholder incentives recovered through rates. SCE substantially ramped up its budget for energy efficiency programs.

In 1994, SCE's investments in DSM were equal to 1.8% of its gross revenues, totaling \$121 million. SCE's 1994 comprehensive portfolio of DSM programs yielded energy savings equal to 1.2% of the total energy demand. These programs also yielded peak capacity savings equal to 1.9% of the utility's peak demand. [R#23]

Recently, however, two factors have significantly altered SCE's focus on energy efficiency. First, of course, has been the threat of competition made clear by the California Public Utilities Commission's "Blue Book" proposal on direct access. Second, the Internal Revenue Service (IRS) filed suit with Edison claiming that it had improperly treated its DSM expenditures for many years, leaving the utility potentially liable for millions of dollars in back taxes and penalties. In part, because of the outstanding case, the California PUC granted SCE permission to downscale its DSM programs. SCE has reduced its DSM expenditures from \$150 million in 1994 to \$50 million in 1995, causing

most rebate programs to come to a halt. In January of 1995, SCE received a favorable ruling from the IRS. With all of the IRS suits settled, SCE can now re-focus on DSM strategies for the future. [R#20]

SCE continues with DSM efforts within its means. For instance, SCE's Customer Technology Application Center (CTAC, Profile #84) offers technology demonstrations, workshops, seminars, training, and information to its commercial, industrial, agricultural, and residential customers as well as employees. The information not only promotes efficiency but also helps Edison's customers comply with environmental regulations. Also, Edison recently introduced a new pilot called ENVEST that is stimulating the energy services network within its service territory, providing a full range of services from project management to financing (see The Results Center Special Report: "Financing Customer Energy Efficiency," March 1995). [R#3]

SCE's involvement with DSM has led to many successes. SCE's Compact Fluorescent Bulb Program, the subject of this profile, is among the most successful and innovative in the United States. While it was one of the many DSM programs cut in 1995 as a result of SCE's DSM spending reduction, it has served as a valuable model for many energy efficiency lighting programs across the country. It shows how utilities can create greater leverage with less dollars by shifting incentives "upstream" from consumers to distributors to manufacturers of energy-efficient products.

Program Design and Delivery

Every year, Americans spend approximately \$7.5 billion on electricity for lighting, accounting for 6% of the nation's primary energy costs. Although compact fluorescent lamps (CFLs) provide light using one-third to as little as one-fourth the energy of incandescent bulbs they are currently used in less than 2% of the country's sockets. Within the residential sector, CFLs face market resistance because of both price and lack of awareness. Those who do know about CFLs generally find their first costs to be prohibitive, unless they drop below \$10, and believe them to be incompatible with household fixtures. In reality, their costs are highly attractive when a lifecycle economic analysis is done. Simple conversion devices such as harps are readily available so that CFLs can be used in a multitude of applications, but because of consumer concerns, retailers shy away from these products. Dealers carrying CFLs are few and normally devote minimal shelf space to these less popular items. These factors have perpetuated the choice of the less efficient incandescent bulb over CFLs.[R#5]

Within SCE's territory there are over 100 million light sockets which have been targeted by various DSM programs attempting to deliver more efficient lighting. The Compact Fluorescent Bulb (CFB) program that ran from 1992-1994, the subject of this profile, was a highly successful and cost-effective model for promoting and accomplishing this task.

Although the correct term for the product is "compact fluorescent lamp," or "CFL," SCE felt that "bulb" was a less confusing term for their consumers and chose to use it for the name of their residential program. Throughout this profile CFB will refer to the residential lighting program and CFL will refer to the product itself, unless specified as the commercial program.

This innovative program aimed at making "the CFL the light bulb of choice by residential customers." SCE recognized that the primary obstacle to this goal was the high price of these more efficient, longer-life lamps, which could sometimes cost 10 to 30 times more than regular incandescent bulbs. By devising a method of delivering CFLs at a lower cost, SCE moved some two million light bulbs to its residential customers in a matter of just three years. The increase in the number of retail-

ers and in the shelf space devoted to these products during the program was dramatic. There was also a notable increase in knowledge and awareness of CFLs by both the dealers and their customers. Since the program operated at a fraction of the cost of similar efforts, the CFB program provided a successful program template which has since spread to other technologies and other utility service territories.[R#5]

SCE's original approach to energy-efficient lighting in the residential sector, like many other lighting programs across the country, was to distribute CFLs to the households in its territory using conventional approaches. CFLs were initially delivered through direct installation and low-income programs under the Appliance Efficiency Incentives and Direct Assistance umbrellas. SCE also offered various lighting-specific programs over time, such as the Energy Efficient Relamping program. These programs achieved varying degrees of success in bringing energy-efficient lighting into SCE's residences. What these approaches failed to accomplish was a lasting market transformation so that consumers were more likely to purchase energy-efficient lighting products in the absence of the program and any direct financial incentives.[R#8]

TESTING INNOVATIVE APPROACHES

In an attempt to foster this market transformation, SCE launched a three-phase pilot program in 1991. This program tested various methods for lowering the retail price of CFLs in order to stimulate consumer demand for these products within the residential sector. The first phase of this program took place in March when \$5 clip-out rebate coupons were distributed to customers via local media such as newspaper ads. Over 4,000 coupons were redeemed in a six-week period.

Phase Two of the program used \$5 rebate coupons to motivate consumers to purchase CFLs, this time through direct mail and point-of-purchase displays at over 200 locations. This phase of the program ran from May through December of 1991, a six-month period during which 25,000 coupons were redeemed.[R#4]

Program Design and Delivery (continued)

Both of these approaches offered retail discounts on CFLs at the consumer level. Overhead costs for these two phases ran about 70% of total program costs. This greatly exceeded the California Public Utility Commission's (CPUC) stipulation that no more than 30% of the total program cost be expended as overhead. Thus the program, as Program Manager Bill Grimm described, was "upside-down in cost effectiveness." Furthermore, the two phases of the program moved a combined total of less than 30,000 lamps. Clearly, this use of rebate coupons proved to be an unsuccessful strategy for advancing CFL use by residential customers.[R#4,8]

The program's third phase was implemented in December of 1991. Edison tested a new direction for delivering discounts to the consumer by giving the rebate to the manufacturer. Three lighting manufacturers received \$5 per CFL rebates for a portion of their CFL inventory to be sold within SCE's territory. The products were discounted at the wholesale price before being marked-up for retail, creating a second generation discount much greater than \$5. This method sparked the sale of approximately 170,000 CFLs in a three-week period. In addition to this dramatic improvement in retail performance of these products, administrative costs were reduced to 29% of total program costs.[R#4]

THE RESIDENTIAL CFB PROGRAM

With the success of the pilot program in December of 1991, SCE launched a full-scale CFB program from July through December of 1992. Requests for proposals were issued to 35 manufacturers. Of the sixteen which responded, nine elected to sign an agreement with SCE. The program's goal for 1992 was to move 518,000 units which would generate an annual estimated savings of 47,382 MWh. Actual sales of rebated merchandise was almost double that, topping 950,000 lamps. Administrative costs ran about 10% of the program's total cost of \$4 million. Although the program was only budgeted for \$2 million, SCE had the funding flexibility to shift the additional funds needed to cover the \$3.7 million in incentives. SCE determined that the savings generated by the program merited the redistribution of program funds.

In 1992, there was a tremendous leap in the number of retailers carrying CFLs, jumping from 100 to 800 outlets. This increase was complemented by the amount of shelf space des-

ignated to CFL products and the displays which accompanied them. Additionally, sales clerks grew more knowledgeable about CFLs in general and were more apt to recommend them to customers.

In 1993, the number of participating manufacturers increased to eleven. The rebate allotment for 1993, however, covered nearly 467,000 units, significantly less than the previous year's performance due to budget restrictions. However, participation from both manufacturers and retailers remained level. By this time, the CFL market in SCE's territory had been strongly reshaped as a result of the program.

THE COMMERCIAL CFL PROGRAM

Success of SCE's residential CFB program inspired the utility and its Energy Efficiency Division to launch a parallel commercial energy-efficient lighting program. In 1993, SCE piloted its commercial version, simply called "the CFL Program." (The different terms "CFB" and "CFL" were used to distinguish the residential from the commercial program.) The Palm Springs area was chosen as a test market for this program, a test that resulted in the sale of 455,139 CFLs to SCE's commercial customers. Expanding on the residential program, rebates were issued to manufacturers for hard-wired fixtures, retrofit kits, as well as screw-based lamps. Structured like the residential CFB program, it was simple to administer. Since contact with the manufacturers had already been established, the participants were already educated in the program and ready to participate. The amount rebated per unit, however, was more complex for the commercial program since this sector involves greater diversity and use of lighting fixtures. Rebates ranged from \$5 for retrofit kits and screw-in lamps to \$10 for fixtures, for a weighted average of \$6.50 to \$7.50 per unit, depending on the market. The commercial CFL program went full scale and territory wide in 1994.

The resultant energy savings from this sector were significantly greater than with residential customers. This was as expected since lighting accounts for approximately 3.8% of the residential customer's total electricity use (38 GWh nationally for 1993), whereas 10.4% of the commercial sector's total electricity consumption is devoted to lighting (83 GWh nationally for 1993). Likewise, the capacity savings was so much greater in the commercial program because SCE's peak demand is dur-

CONSUMER PRICE FOR VARIOUS REBATE SCHEMES

No Rebate: \$20.04



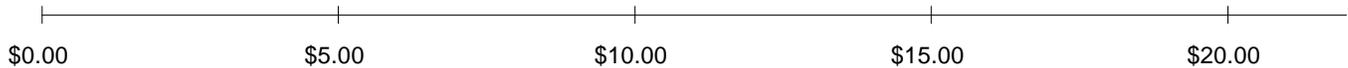
\$5 Coupon : \$15.04



\$5 Manufacturer's Rebate: \$11.69



\$5 Manufacturer's Rebate Plus \$1.50 Contribution: \$9.19



ing the afternoon, from 1:00 to 5:00 PM, and because commercial lighting accounts for a large of this peak demand. Residential lighting by contrast, comprises a much smaller portion of system peak usage. [R#3,24,25]

THE DOWNSTREAM EFFECT OF MANUFACTURERS' REBATES

The CFB manufacturers' rebate program took advantage of the normal functioning of the retail process. Typically, lighting products receive a 67% mark-up on the wholesale price before going out on the shelf. For instance, a lamp sold by a manufacturer for \$12 is marked up and sold at retail for \$20.04. Early rebate programs generally provided the rebate to the customer. Thus a \$5 rebate effectively reduced a \$20.04 purchase price to \$15.04.

By providing a \$5 incentive to the manufacturer, instead of the consumer, the consumer actually pays less because of the retail mark-up process. A basic stipulation of the program was that the manufacturer pass along the rebate amount to its retailers. Thus the 67% mark-up was only applied to the discounted bulb price.

With SCE's \$5 buy down of the wholesale price, retailers can purchase the same \$12 product for \$7 and pass on the wholesale savings and the subsequent reduction in mark-up. Therefore, the same unit would sell for \$11.69 (\$7 wholesale price plus a 67% markup of \$4.69 = \$11.69), lowering the price to the consumer. In contrast to more traditional rebate programs, where the consumer received a \$5 rebate, this program gives the consumer the equivalent of a \$8.35 rebate, (\$5 wholesale rebate plus a 67% markup of \$3.35 = \$8.35), equal to half the product's original price. Put another way, the manufacturers' rebate creates additional savings to the consumer of \$3.35 over the more traditional program design.

The program design became more compelling when Edison encouraged the manufacturers to also contribute a price reduction to complement the SCE rebate. Since they would benefit in the future as the market for CFLs becomes transformed, manufacturers were willing to also contribute to the program. Essentially, manufacturers provided their own rebates, amplifying the downstream savings to the consumers. Manufacturers' average contribution was \$1.50 per CFL. [R#3,5]

Program Design and Delivery (continued)

SELECTING MANUFACTURERS

One of the unique features of the CFB and CFL programs was that once manufacturers became aware of the program and its benefits regarding product sales, they actually began to compete to participate. Manufacturers wishing to participate in SCE's CFB program submitted a proposal and competed for a share of a rebate pool. The total amount of the rebate pool, or number of units to be discounted that year, was specified in the program's annual budget, reflecting the projected number of bulbs to be moved by the program. SCE divided the rebates among the selected manufacturer's and allocated rebates for portions of these manufacturers' inventories based on a number of factors such as the manufacturer's price reduction contribution to the rebate and their distribution capabilities. This selection process accomplished several things for SCE. For example, it enabled SCE to maximize product discounts while minimizing program costs. SCE awarded level-of-participation points to manufacturers who would match a portion of the rebate and could contribute to the marketing of the program through cooperative advertising and promotions.[R#5]

SCE also awarded points based on product specification. Products had to meet their performance criteria in order to qualify for rebate allotments. These product features included high power factor, low total harmonic distortion, high lumens per watt, and high color rendering. By extending rebates to those products with specific technological features, SCE had a hand in directing the market by favoring those items whose quality could most effectively compete at the consumer level with incandescent bulbs.

Finally, allocating rebates ensured that discounted products found their way to the retail shelves rapidly. Manufacturers' distribution capabilities were factored into rebate allotments, so that those manufacturers vending to larger retail chains earn additional points. Furthermore, participating manufacturers were required to commit to selling 30% of the inventory allocated for rebate by three weeks, 60% by eight weeks, and 100% by twelve weeks. Rebates for any unsold inventory at the end of each selling period were forfeited to SCE and reallocated to another manufacturer who successfully met the selling deadlines.

The program design also allowed for a great deal of flexibility in how manufacturers utilized the rebate money. For instance, a manufacturer could redistribute the dollar discount per model depending on the product offering and the savings possible, so long as the rebates averaged out to \$5 per unit. A relatively inexpensive product might only receive a \$1 rebate so that the remaining \$4 could be reassigned to a more costly product which would generate a greater savings. Shifting the incentive dollars was considered an entirely appropriate means to save the most kilowatt-hours per dollar.

Similarly, wattage categories were established to predict the savings outcome. The manufacturer was able to shift rebate allotments from one wattage group to another if it was felt that the discount would be more effective on a different product or if the product could generate greater savings. In this case, the reallocation had to be approved by SCE.

For the commercial CFL program, assignment of rebate dollars was made by product category – screw-in lamps, retrofit kits and fixtures – which varied by savings and dollars per unit. The manufacturer again had the flexibility to reallocate rebate dollars to different categories. The process became more complicated in the case of the commercial program, because of the difference in awarded dollars per unit. SCE was willing to do the extra legwork to track any redistribution the manufacturer requested in exchange for a guarantee that the resulting savings would equal 110% of what was originally awarded. In a sense, Bill Grimm pointed out, the program really boiled down to \$/kWh and it seemed to work since half of the manufacturers took advantage of the option.

ISSUING REBATES

Another important feature of the program design was its ability to track actual sales of the incentivized units. Manufacturers were required to verify the number of units sold by presenting the necessary purchasing and shipping documentation to SCE. This documentation comprised a "Proof of Performance" package which the manufacturer submitted to SCE along with an invoice for the corresponding amount of rebate dollars. Once the sale of the allotted goods was verified, the rebate

was issued. In addition to providing a mechanism for ensuring the movement of the bought-down inventory, this structure provided a tracking system which was completed by the manufacturer. Another nice feature of the program design is that the tracking responsibility was effectively transferred from the utility to the manufacturer. [R#8,15]

FIELD INSPECTION

To ensure that the program was implemented properly at all levels, SCE staff conducted field inspections at participating retailers. Site visits were conducted to collect data on inventory for program monitoring. Additionally, this monitoring process ensured that products were appropriately priced and stocked, and bore a sticker provided by the manufacturer indicating that the product was available at a special price in cooperation with Southern California Edison.[R#8,9]

MARKETING

One of the program's strengths is that it passed the bulk of the marketing onto the participating manufacturer. As stated earlier, the manufacturer's marketing contribution was one of SCE's selection criteria for rebate allotments. By providing "co-op advertising dollars" for their retailers, along with coordinating in-store promotions and promotional materials, manufacturers earned a larger amount of rebate dollars, and SCE was assured of the program's marketing. Typical promotions made by manufacturers included: advertising, supplying posters and aisle-front kiosks for products, and shipping products with special packaging or bright stickers. Additionally, manufacturers worked to increase the awareness and product knowledge of their dealers in order to facilitate customer awareness and stimulate sales.

In addition to the solicited promotional efforts of the participating manufacturers, SCE marketed the program at the large "ECO EXPO" trade show in Los Angeles. SCE took advantage of the show to invite neighboring utilities to participate in the program. In 1994, SCE moved approximately 50,000 lamps into adjacent territories such as the Los Angeles Department of Water and Power, and billed the utility for time and merchandise. [R#8,14]

SCE also marketed the program through its toll-free Action Line which received hundreds of calls from consumers daily. This service provided consumers with information on energy-efficient lighting, including brochures on products and the program. The consumer could also use the Action Line to get the name of his or her closest participating dealer.[R#9,16]

MEASURES INSTALLED

Eligible products for the residential CFB program included CFLs with magnetic, electronic, and hybrid ballasts. Any modular products were to be packaged together so that lamp and ballasts were sold as a singular unit. Lamps considered for the rebate allotment were classified in one of three wattage groups: 5-15 watt CFL, 16-22 watt CFL, 23 and greater watt CFL. The commercial CFL program expanded its list of eligible products to include retrofit kits and fixtures.

STAFFING REQUIREMENTS

The CFB program was designed to minimize utility program overhead by minimizing administrative costs for SCE. By passing the majority of the tracking and marketing duties of the program on to the participating manufacturers, SCE kept its staffing demands for the program low. Program Manager Bill Grimm spent about one-third of his time on the CFB program before becoming the Program Manager for the CFL program. In 1993, Jody Moore took over the position. Equivalent input was required from the program's administrative assistant. The program required three full-time equivalent (FTE) field inspectors to monitor the program at point-of-purchase locations. Their work was overseen by the field supervisor who directed approximately one-third of his work toward the CFB program. Total FTE for the CFB program is four. Staffing for the CFL program was equivalent.[R#8]

Monitoring and Evaluation

MONITORING

A self-monitoring component was designed into the program so that the movement of the discounted CFLs could be both tracked and controlled. By requiring manufacturers to verify that a specified percentage of the bought-down inventory had been sold within a certain time frame, Edison knew exactly how many lamps were sold throughout the duration of the program. The figures were tracked by the manufacturers and reported to Edison in order to ensure compliance with the quota agreement. Verification was provided through purchase orders and shipping documents supplied by the manufacturer. All participating manufacturers had to comply to receive their rebates. Failure to meet the quota resulted in the redistribution of rebates for the unsold inventory.

While the program design tracked products' distribution to the retail outlets it did not include a method for verifying their performance at the consumer level. SCE's primary method for monitoring the program's performance was through field inspection. Data on the model numbers and inventory of the rebated items were collected throughout the year from all participating retailers in the area by SCE's field crew. This information confirmed the distribution patterns of the discounted items and what their market share was. Field inspectors also collected information on the amount of shelf space given to the program's inventory as well as the number of "facings" and special product displays. The program was also indirectly policed by the field crew who alerted dealers of inventory which needed to go on the sales floor and manufacturers of retailers who were not reflecting the discount in their pricing.

EVALUATION

In order to determine end-use impact of the CFB program, SCE has conducted evaluations of the residential use of lighting. Its Residential Lighting Study, conducted in 1993, involved an on-site inventory of several hundred residences within SCE's territory. Data was collected on the number of fixtures, number and types of bulbs and the types of rooms they were used in, number of hours used and time used. This information was compiled to form a baseline measure of residential lighting for evaluating the savings produced by the CFB program. [R#3]

A further study conducted in 1994 involved phone interviews with over 500 customers who purchased CFLs at the program's reduced price. Information gathered by this survey along with that from the Residential Lighting Study was used to establish a percentage of bulbs used outside SCE's territory as well as the percentage of bulbs installed and their usage. Responses indicated, among other things, that approximately 13% of the bulbs sold at the consumer level "leaked" out of SCE's service territory to outlying residences. [R#4]

SCE works cooperatively with its neighboring California utilities, SDG&E and PG&E, in determining end-use patterns for residential lighting. SDG&E has shared results from phone surveys it has conducted. PG&E has conducted extensive metering of incandescent and CFL as well as a survey of hours of use. Their findings help confirm the data collected by SCE. [R#10]

Program Savings

DATA ALERT: SCE assumes a different average kWh of annual savings per unit for each watt category for calculating their energy savings. Burn time is assumed to be 2.73 hours per day, 365 days a year for all categories.

Annual savings for the residential CFB program's pilot and first complete year were reported by SCE in a combined figure and totaled 47,382 MWh, followed by a savings of 22,800 MWh and 30,875 MWh for 1993 and 1994 respectively. Total annual savings for the program was 101,057 MWh with total cumulative and lifecycle savings of 202,114 MWh and 656,871 MWh respectively. Capacity savings for the CFB program's first year were not calculated since the savings from a residential lighting program would not effect peak hours. After the Residential Lighting Study was conducted, SCE was able to calculate a capacity savings for the program based on use profiles determined by the study. For 1993, annual capacity savings were estimated at 611 kW and for 1994, 920 kW. The total annual capacity savings for the program was 1,531 kW.

Annual savings for the commercial CFL program were 70,416 MWh and 48,563 MWh for 1993 and 1994 respectively for a total annual savings of 118,979 MWh. Total cumulative and lifecycle savings were 237,958 MWh and 773,365 MWh. Capacity savings for the commercial CFL program were 22.22 MW and 12.54 MW for 1993 and 1994 for total annual capacity savings (and 1994 cumulative capacity savings) of 34.76 MW.

PARTICIPATION RATES

Participation occurred on three levels for this program. The first level was participating manufacturers, which increased from 3 during the pilot program in 1991 to 11 for the last two

years of the CFB program. While the number of manufacturers did not affect the total number of units rebated through the program, it did influence the market penetration of the program. Bill Grimm noted that the CFL market in SCE's territory has been totally reshaped as a result of the program.

The second level was retailers. At the second level, participation increased by a factor of eight once the program was implemented. (Prior to the program, only about 100 stores carried CFLs in SCE's territory.) This increase was significant to the success of the program for two reasons. First, it increased consumer awareness and made the product more accessible. Second, it increased competition for the product, moving inventory faster and driving the prices on non-rebated products down.

The third level of participation was at the consumer level, the number of bulbs which were sold, and presumably installed, through the program. Cost per CFL sold remained constant \$5 due to the program's design. Since cost was a constant, the number of units which were rebated was the variable, depending on SCE's budget for the program. Thus, the number of rebated bulbs was determined by budget allocation which decreased from 1992 to 1994.

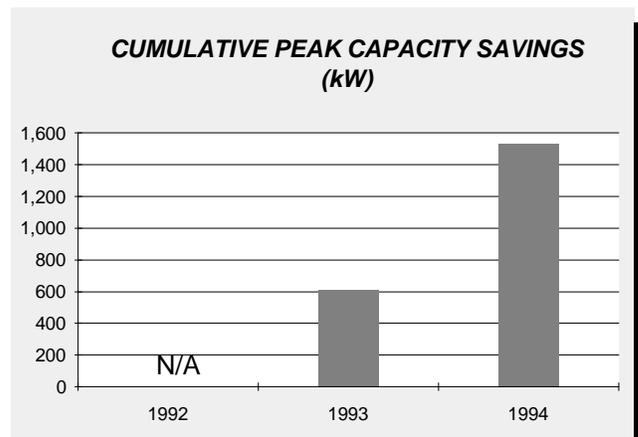
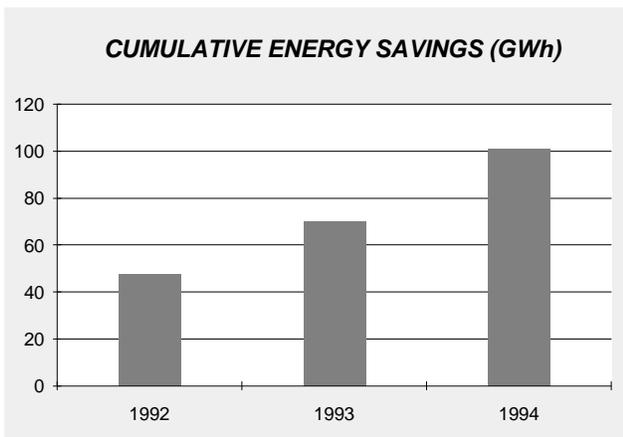
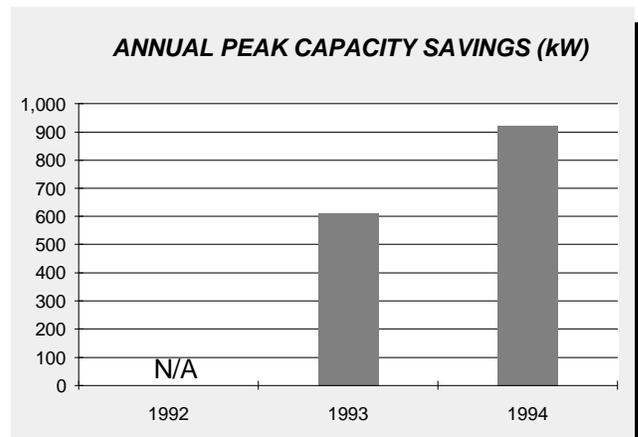
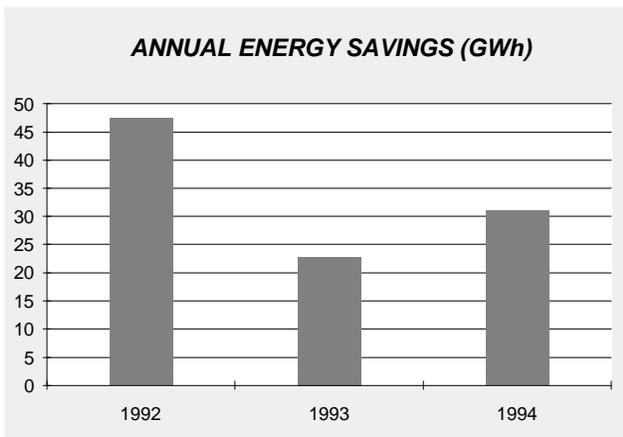
The same holds true for the commercial CFL program which increased its number of participating manufacturers by a factor of three, and distributors by a factor of ten but decreased the number of rebated units, due to budget constraints.

The Results Center's calculations for annual savings per bulb for the residential CFB program ranged from 48.89 kWh to 50.33 kWh. The fluctuations which occurred in the savings per unit indicate that there was a shift in the percentage of units for each watt category. The same observation can be

PARTICIPATION TABLE	NUMBER OF MANUFACTURERS	NUMBER OF RETAILERS	NUMBER OF REBATED UNITS	ANNUAL ENERGY SAVINGS PER REBATED UNIT (kWh)
CFB				
1992	9	800	950,000	49.88
1993	11	770	466,374	48.89
1994	11	824	613,417	50.33
Total			2,029,791	49.79
CFL				
1993	6	13	455,139	154.71
1994	18	148	321,058	151.26
Total			776,197	153.28

Program Savings (continued)

CFB SAVINGS OVERVIEW	ANNUAL ENERGY SAVINGS (MWh)	CUMULATIVE ENERGY SAVINGS (MWh)	LIFECYCLE ENERGY SAVINGS (MWh)	ANNUAL CAPACITY SAVINGS (kW)	CUMULATIVE CAPACITY SAVINGS (kW)
1992	47,382	47,382	307,983	N/A	N/A
1993	22,800	70,182	148,200	611	611
1994	30,875	101,057	200,688	920	1,531
Total	101,057	202,114	656,871	1,531	



made for the commercial CFL program, which ranged from 151.26 kWh to 154.71 kWh annually.

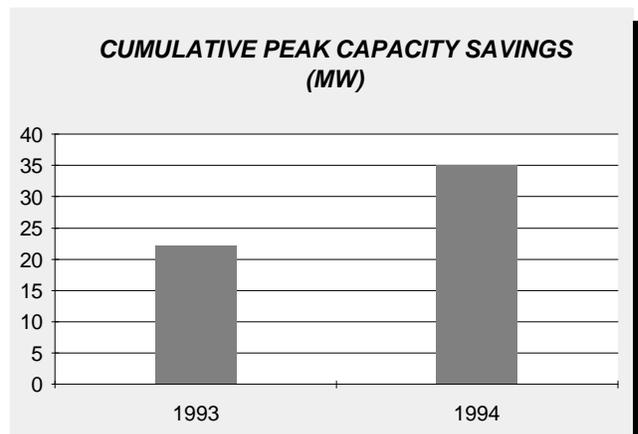
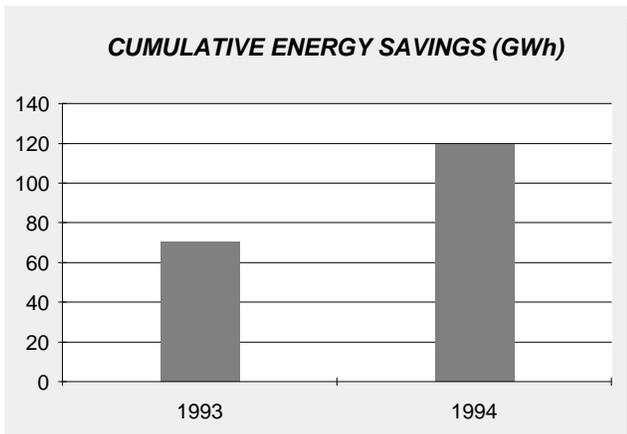
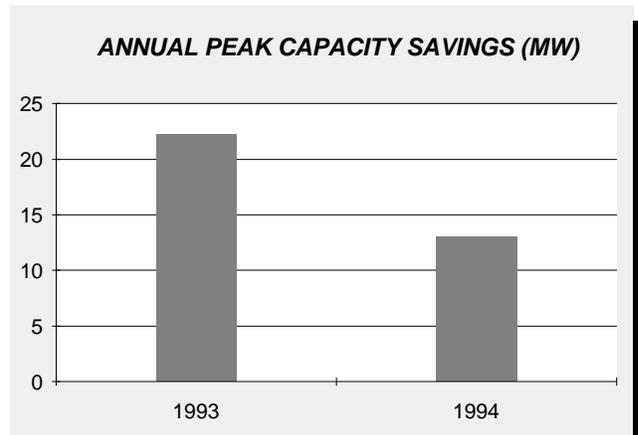
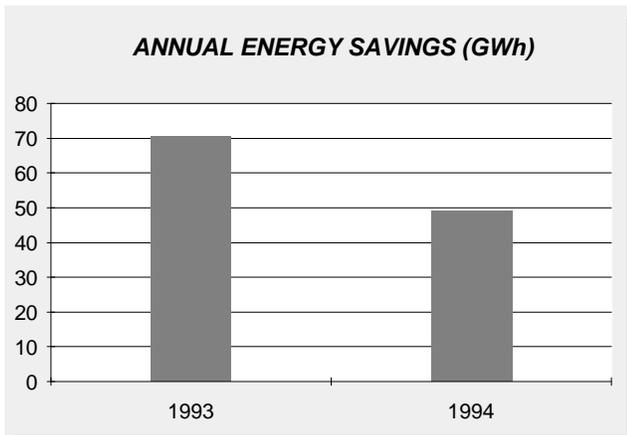
FREE RIDERSHIP

Prior to the residential CFB program, there was essentially no market for compact fluorescent lamps with residential customers. Although an estimated 100 retailers within SCE's service

territory carried CFLs prior to the onset of the program, the amount of shelf space, advertising and product knowledge for CFLs was minimal and consequently so were the sales. Given the negligible presence of CFLs, SCE assumes no free ridership for the CFB program and has not compensated for it in their estimated savings.[R#17]

While the potential for free ridership is slightly greater in the

CFL SAVINGS OVERVIEW	ANNUAL ENERGY SAVINGS (MWh)	CUMULATIVE ENERGY SAVINGS (MWh)	LIFECYCLE ENERGY SAVINGS (MWh)	ANNUAL CAPACITY SAVINGS (MW)	CUMULATIVE CAPACITY SAVINGS (MW)
1993	70,416	70,416	457,707	22.22	22.22
1994	48,563	118,979	315,658	12.54	34.76
Total	118,979	237,958	773,365	34.76	



commercial sector, the market for CFLs without some form of discount or rebate was still considered minimal. Since the commercial CFL program was simply a shift of an existing model into a new sector, SCE did not assume any free ridership. [R#17]

Free ridership, however, certainly seemed to occur during the life of this program. In many cases, retail prices on non-discounted units were driven down in order to compete with the program's bought down inventory. The program penetrated the market in this way for several weeks after the distribution

of the discounted goods. [R#6]

MEASURE LIFETIME

The average lifespan for CFLs used by SCE to calculate the savings realized by this program was 6,500 hours, a figure which takes into account some early removal of bulbs from sockets. Assuming 1,000 hours of use per year per bulb, SCE uses a 6.5 year average lifetime for bulbs sold by the program in its calculations. [R#5]

Cost of the Program

DATA ALERT: Figures reported for the CFB program in 1992 include the program's three-week pilot period in December of 1991.

The commercial CFL program had expenditures of \$2,483,720 for its pilot program in 1993. As with the residential program, the CFL program's budget allocation decreased in 1994 when \$1,832,876 was expended. Total costs for this two-year program were \$4,316,595.

COST EFFECTIVENESS

Program costs for the CFB for the three-week pilot and the first full year of the program reached a combined total of \$4,802,639. In the following two years of the program budget allocation dropped, lowering expenditures to \$2,293,822 in 1993 and \$2,994,373 in 1994. Total expenditure for the tenure of the program equalled \$10,108,834.

The Results Center's calculation of the cost of saved energy for the CFB program ranged from 1.75¢-2.14¢/kWh for its first year based on a 3% to 9% discount rate range. By the time the program had matured in its last year, that cost had dropped slightly, to a range of 1.66¢-2.04¢/kWh.

<i>COSTS OVERVIEW</i>	<i>ADMINISTRATIVE COSTS</i>	<i>INCENTIVE COSTS</i>	<i>TOTAL PROGRAM COSTS</i>	<i>AVERAGE COST PER UNIT</i>
<i>CFB</i>				
<i>1992</i>	\$407,496	\$4,413,144	\$4,820,639	\$5.07
<i>1993</i>	\$203,146	\$2,090,676	\$2,293,822	\$4.92
<i>1994</i>	\$267,673	\$2,726,700	\$2,994,373	\$4.88
<i>Total</i>	\$878,315	\$9,230,519	\$10,108,834	\$4.98
<i>CFL</i>				
<i>1993</i>	\$14,691	\$2,469,029	\$2,483,720	\$5.46
<i>1994</i>	\$113,462	\$1,719,413	\$1,832,876	\$5.71
<i>Total</i>	\$128,153	\$4,188,442	\$4,316,595	\$5.56

COST OF SAVED ENERGY AT VARIOUS DISCOUNT RATES (¢/kWh)	3%	4%	5%	6%	7%	8%	9%
CFB Program							
1992	1.75	1.81	1.87	1.94	2.00	2.07	2.14
1993	1.73	1.79	1.85	1.91	1.98	2.04	2.11
1994	1.66	1.72	1.78	1.85	1.91	1.97	2.04
CFL Program							
1993	0.61	0.63	0.65	0.67	0.69	0.72	0.74
1994	0.65	0.67	0.69	0.72	0.74	0.77	0.79

Cost effectiveness for the commercial CFL program was even greater. For this program the cost of saved energy ranged from 0.61¢-0.74¢/kWh in its first year and 0.65¢-0.79¢/kWh in its second year. The cost effectiveness of the program was a function of the preexisting residential program coupled with the lower administrative costs of a commercial program.

COST PER PARTICIPANT

The program cost per rebated unit for the CFB program dropped from \$5.07 in its first year to \$4.88 in its last year for an average cost of \$4.98 per CFL. (Note that all dollar figures have been levelized to 1990 values, which is why the average cost per CFL is below the rebate amount of \$5. Unlevelized figures ran from \$5.46 to \$5.56, reflecting the \$5 rebate and 10% administration costs.) Costs per unit for the commercial CFL program averaged \$5.56 for the program's two years, re-

flecting a slightly higher average rebate per unit but a lower administrative cost per unit.

COST COMPONENTS

An important element of the CFB program's design was the shifting of a portion of the administrative and tracking costs from the utility to the participating manufacturer. In 1992, the administrative costs were 8.5% of the program's total cost while manufacturer rebates accounted for the rest. For each of the following two years, administration accounted for 8.9% of total costs. This percentage was even lower for the commercial CFL program since the structure for this model was already in place. Administrative costs for the CFL program in 1993 were just 5.9% of the total costs; in 1994 they comprised 6.2% of total costs. Again, the balance of the program costs went to product rebates.

Environmental Benefit Statement

AVOIDED EMISSIONS: Based on 440,072,000 kWh saved 1992-1994						
Marginal Power Plant	Heat Rate BTU/kWh	% Sulfur in Fuel	CO2 (lbs)	SO2 (lbs)	NOx (lbs)	TSP* (lbs)
Coal Uncontrolled Emissions						
A	9,400	2.50%	948,795,000	22,510,000	4,550,000	455,000
B	10,000	1.20%	1,011,726,000	8,713,000	2,938,000	2,178,000
Controlled Emissions						
A	9,400	2.50%	948,795,000	2,251,000	4,550,000	36,000
B	10,000	1.20%	1,011,726,000	871,000	2,938,000	145,000
C	10,000		1,011,726,000	5,809,000	2,904,000	145,000
Atmospheric Fluidized Bed Combustion						
A	10,000	1.10%	1,011,726,000	2,662,000	1,452,000	726,000
B	9,400	2.50%	948,795,000	2,251,000	1,820,000	137,000
Integrated Gasification Combined Cycle						
A	10,000	0.45%	1,011,726,000	1,791,000	290,000	726,000
B	9,010		910,069,000	649,000	218,000	44,000
Gas Steam						
A	10,400		551,850,000	0	1,259,000	0
B	9,224		479,238,000	0	3,001,000	142,000
Combined Cycle						
1. Existing	9,000		479,238,000	0	1,840,000	0
2. NSPS*	9,000		479,238,000	0	871,000	0
3. BACT*	9,000		479,238,000	0	121,000	0
Oil Steam--#6 Oil						
A	9,840	2.00%	798,731,000	12,102,000	1,428,000	1,355,000
B	10,400	2.20%	847,139,000	12,005,000	1,796,000	871,000
C	10,400	1.00%	847,139,000	1,714,000	1,443,000	455,000
D	10,400	0.50%	847,139,000	5,034,000	1,796,000	277,000
Combustion Turbine						
#2 Diesel	13,600	0.30%	1,060,133,000	2,111,000	3,277,000	179,000
Refuse Derived Fuel						
Conventional	15,000	0.20%	1,258,606,000	3,243,000	4,270,000	949,000

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 Southern California Edison's level of avoided emissions saved through its CFB & CFL Manufacturer Rebate Programs 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.

* Acronyms used in the table

TSP = Total Suspended Particulates

NSPS = New Source Performance Standards

BACT = Best Available Control Technology

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.

Lessons Learned / Transferability

LESSONS LEARNED

Success of the program is quite evident by the market transformation which has occurred: The number of retailers which carry CFLs has increased eight-fold since the program began. This growth is amplified by the increased shelf space allotted to compact florescent lamps in most stores. In addition, both dealers and consumers have a heightened awareness of efficient lighting products. As a result of the program, what was once a specialty product, seldom stocked, and sold only upon request, is now the subject of discounts and displays.

SCE's first lessoned was learned by comparing different approaches to the market during the course of the pilot program: By experimenting with various models for retail price reduction of CFLs, SCE could discover what method was both cost-effective to implement and successful in generating savings. This approach enabled SCE to find a model worthy of full-scale implementation.

There was some resistance to the program from some of the market's leading manufacturers: Those manufacturers who already held a major portion of the CFL market share were opposed to the program, seeing the potential shift in the market as a result of the rebate program. Moreover, some of these manufacturers also hold a large portion of the incandescent market share, and could stand to lose ground if that market shifted to CFLs. While some manufacturers chose not to participate and some even shifted their product focus away from CFLs for that territory, the program was able to obtain strong participation from other manufacturers. Even though a major contender in the efficient lighting market withdrew from SCE's territories, their spot was filled and expanded by new manufacturers as a result of the program. Some manufacturers reported to have used the program to their advantage to gain market share.

Determining the impact of the program proved to be an inexact science at best: While it was easy to track the number of units sold through the program, tracking end use

was quite another thing. Extensive interviews and research conducted by SCE helped to define the average use of residential lightbulbs as far as hours used and total hours burned. Information from these studies was used to estimate the savings of the CFB program.

At the retail level, the program was not necessarily confined to the SCE territory: Through investigating the end use of lamps sold through the program, SCE identified another problem with this model. Just as there is no way of tracking how a lamp is used (or even if it is used), SCE has no way of assuring where the lamps are used. Through their studies, SCE has determined that approximately 13% of CFLs purchased with a program rebate wound up outside of SCE's service territory. The lost rebate dollars are considered tolerable in light of the program's avoided costs. In order to minimize leakage, SCE has encouraged utilities with adjacent territories to develop similar programs for their customers. In some cases, as with LADWP, it has extended the distribution of the lamps into a neighboring utility's area, with reimbursement for the incentive and administrative costs. SCE essentially ran the program for them in their territory. [R#3]

The level of free ridership for the program was a difficult factor for SCE to determine: Since data on the market performance of CFLs was not collected prior to the program's implementation, there was no baseline data to quantify free ridership. Edison believes that prior to the program, the CFL market was negligible – hence no free ridership. Bill Grimm reports that a few locations which had ordered efficient lighting products prior to the program, did not change their original order, but placed an additional order for the discounted items. Again, this indicates essentially no free ridership. [R#8,10]

One interesting aspect which developed out of the CFB program was the free drivership which occurred at the retail level: Retailers who either sold out of their rebated stock, or did not carry the rebated products would impose their own discount on regularly priced units in order to compete, not only for customers but for future distribution of dis-

counted products as well. The program effectively drove the market prices down for CFLs, adding participation in discounts without issuing rebates. In some cases, this markdown trend would last up to eight weeks before the program's effect subsided.

Customer recognition could have been strengthened for the program: Implementation of the program included a fluorescent sticker which was applied to the packaging of all discounted units, stating that the product was available to the customer at a lower retail price in cooperation with Southern California Edison. However, Program Manager Bill Grimm felt that the customer did not clearly receive the message that SCE was delivering this savings to its customers. A stronger connection to SCE and the special pricing could have been made.

Once the program was tested, refined and in place, it became a cookie cutter for programs targeting other markets: SCE found that this model was not only a highly successful version of a rebate program, but one that was also easily transferable. SCE applied the same model, using the same infrastructure, to the commercial sector of the lighting industry and to other technologies, chiefly energy-efficient motors.

The lasting effect of the program on the residential lighting market after the program's discontinuance is yet to be determined: Because of both the IRS audit and more importantly, the increasingly competitive environment of the utility industry, SCE's rebate programs were discontinued. While the program would have certainly continued were it not for these influences, its unfortunate cancellation does offer the opportunity to see whether the program created a permanent effect on the market. While it is too early to tell, since the program's final discounted stock is just now moving out, there is evidence of a long term market transformation. Retailers in SCE's territory have shifted this product segment into a lower mark-up bracket resulting in a lower base price for CFLs in the region. SCE will continue to measure the program's effect of the market for the next few years in order to determine the longevity of the program's effects.[R#8]

TRANSFERABILITY

Within SCE, the CFB manufacturers' rebate model has been transferable to both other markets and other technologies. Two years after the residential program was piloted, SCE launched its commercial CFL program. SCE also found that this model could work for other programs when it launched its Energy Efficient Motor pilot program in 1993. The program saved 5.944 GWh with a capacity savings of 1.981 MW at a cost of \$545,000. The program went full scale the following year, saving 3.784 GWh with a demand savings of 1.266 MW before SCE had to halt its rebate programs. The program moved 6,271 and 3,017 units in 1993 and 1994 respectively. A Residential Energy Efficient Pool Pump Motors program was piloted in 1994. The program saved 1.189 GWh with a capacity reduction of 813 kW, moving 6,369 motors. Expenditures totaled \$136,100.

While some variables could account for different levels of success between the programs, the structure of the program was suitable for each application. Program Manager Bill Grimm was quick to recognize that the manufacturer's rebate was transferable to other SCE DSM programs with great ease since the infrastructure was already in place.

Other utilities have successfully transplanted this manufacturers' buy-down model into their DSM portfolios as well. Three of SCE's California neighbors, PG&E, SDG&E, and SMUD have adapted this model for their own applications and experienced varying degrees of success. Bonneville Power Administration is currently implementing a CFL Manufacturers' Buy-down program designed after SCE's CFB program.[R#8,21]

By far the most impressive influence this program has had is felt in the national residential and small commercial energy efficient lighting initiative which is currently being developed by several non-profit organizations in cooperation with the Consortium for Energy Efficiency (CEE). Chris Granda, who has been developing the program at CEE for two years, explains that the program is modeled from SCE's CFB program and draws from its experiences. The initiative proposes to

Lessons Learned / Transferability (continued)

serve as a template for any utility wishing to instigate an energy-efficient lighting program. Two primary elements are contained in the initiative. The first is the manufacturer's incentive in which the utility contracts with the manufacturer to buy down wholesale prices of efficient lighting products. The second is a product assessment approach which provides a common scoring system for evaluating the manufacturer's technical and marketing proposals in their applications. [R#6]

At present, CEE's initiative is being marketed in hopes of recruiting a core group of utilities to sign up in 1995. Many of the West Coast utilities which have already piloted a similar program have shown interest. CEE is targeting the whole region both to minimize leakage and to use as a test market. If proven successful in one region, Granda believes that it will be easier to bring other regions on board, such as the Northeast. [R#18]

While CEE is willing to consider this same model for other technologies, its application is not accepted as universal. Granda believes that when considering the use of manufacturers' rebates, it is wise to consider products and markets individually on their own merits. The incentive is best given to the manufacturer in the case of CFLs, where the number of units effected is relatively high and the cost is low. For other technologies however, such as high efficiency hot water heaters where sales volume is lower and the information required to make a sale is greater, the incentive might be more effective if given to the salesperson. [R#18]

The CEE Lighting Initiative has not been met with complete enthusiasm by the National Electrical Manufacturers Association (NEMA). While NEMA agrees with CEE's objective to "stimulate the market to dramatically increase the production, distribution, purchase and installation of energy efficient lighting in homes and small business", it suggests that CEE's proposed model will actually have adverse effects on the market. NEMA believes that the Lighting Initiative will not receive support from key stakeholders, namely manufacturers, retailers and consumers, because of the model's added costs and confusion. Several reasons were cited by NEMA including: the added costs and confusion associated with additional inventory codes needed by both manufacturers and retailer for tracking; consumers' misinterpretation the program's lower shelf price as the products everyday price; retailers having to stock the same merchandise with two different prices, or manufacturers having to restrict their distribution because of rebates are allocated to a limited inventory; refunds and replacement of bought down inventory at full price; and manufacturers having to wait up to one year for reimbursement. [R#22]

NEMA response to CEE's Lighting Initiative was a proposed "Merchandise Check" made out and sent to the customer, bearing his or her utility account number. These checks would be redeemable at any participating retailer for all qualifying products same as cash. This proposal does provide a simplified tracking system and solves any leakage problems for utilities and solves the above mentioned concerns with the manufacturer's rebate model. However, NEMA's proposal offers no more than a standard coupon program as far as price reduction and market transformations are concerned.

From a manufacturer's point of view, introducing new influences into the marketplace can be understandably undesirable, particularly if they may disrupt a comfortable incandescent or efficient lighting business. Utilities like SCE, however, point squarely to the current market imperfections surrounding CFLs and stand behind means such as the CFB and CFL program to correct this imperfection and to reap greater and greater customer energy and bill savings. [R#19]

Regulatory Incentives and Shareholder Returns

REGULATORY TREATMENT

The purpose of this section is to briefly discuss the regulatory treatment of the costs of Southern California Edison's CFB and CFL Manufacturers' Rebate programs. To do so, a brief review of the regulatory treatment of all SCE's DSM programs is first presented. This is followed by a brief explanation of the specific regulatory treatment of the CFB and CFL programs. Other discussions of the regulatory treatment of California's utilities regarding DSM can be found in Profiles #2,4,14,25,28,33,53,75,81,105.

UTILITY REGULATORY OVERVIEW

Since 1990 Southern California Edison has been eligible to receive earnings by successfully implementing energy efficiency programs. In the late 1980's the California Collaborative built on California's precedent-setting Electric Revenue Adjustment Mechanism (ERAM) which decoupled sales and utility profits. ERAM effectively removed the disincentive for utilities in California to invest in their customers' energy efficiency. The Collaborative was a process in which utilities agreed to increase their concentration and expenditures on cost effective demand-side management. In turn, the Collaborative pushed beyond removing the disincentives to DSM investments and created a situation in which utilities' shareholders are provided incentives for their demand-side management successes.

In 1993, Edison had two incentive mechanisms for DSM programs: s-curve Shared Savings and Performance Adder. For other utilities shared savings means a reward based on a share of net program benefits. However, Edison's reward is determined by a ratio of actual net benefits to forecast net benefits. Earnings are determined through an "s-curve" relationship to this program performance ratio that stipulates various shares of the net savings paid to the utility based on the percentage of forecasted savings actually achieved.[R#3]

The second mechanism, the performance adder, applies to service programs such as home energy surveys, commercial facility surveys, and other educational initiatives. For example, upon completing a pre-specified target number of surveys, Edison earns 2% on residential survey expenses. In another case, if and when Edison achieves its goal of energy savings that result from nonresidential surveys, the utility earns 5% on its nonresidential survey expenses.[R#3]

PROGRAM-SPECIFIC REGULATORY TREATMENT

Both the CFB and CFL programs have been considered Shared Savings programs by SCE and the California PUC. As such, SCE has not only recovered its program expenses and associated lost revenues, but its shareholders have been able to earn returns on their investments. The CFB program, for example, in 1993 was considered part of Edison's Residential Appliance Efficiency Incentives (RAEI). In 1993 the utility planned to spend \$15 million on these programs, actually spent \$12 million, and earned \$1.5 million as a shareholder incentive for the program year.[R#3]

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