Pacific Gas & Electric

Direct Assistance Programs

Profile #75

Executive Summary

Over its ten-year history Pacific Gas and Electric's Direct Assistance programs (Energy Partners and Target Customer Appliance Program) have weatherized more than 600,000 low income homes at a total program cost of nearly a quarter of a billion dollars. In addition, since 1987 more than 90,000 appliances, primarily refrigerators that exceed federal appliance efficiency standards but also furnaces, evaporative coolers, water heaters, etc. have been replaced with energy-efficient models at no charge to low income customers. In addition over 70,000 compact fluorescent lamps were installed as part of TCAP.

Despite the fact that the Direct Assistance programs are clearly not cost effective as defined by the total resource cost test nor the rate impact measure test, the programs have been mandated by the California Public Utilities Commission which has considered the programs very important. So important, in fact, that PG&E's shareholders were rewarded with over a million dollars in incentives for their $35 million programs in 1992.

The Energy Partners component of the Direct Assistance programs has been through an evolution that has enhanced the program, refining its delivery mechanism and quality control procedures, but which unfortunately complicates this profile somewhat and obfuscates its data. Originally part of PG&E's Zero Interest Program, it is now its own program area. The program's initial mandate was to provide "Big Six measures" to low income customers including attic insulation, weatherstripping, caulking, water heater blankets, low-flow showerheads, and duct insulation. Then PG&E added "Non "Big Six" measures to the program including fluorescent bulbs, outlet gaskets, faucet aerators, home repairs, pipe wraps, furnace filters, and evaporative cooler covers. In addition, an energy specialist spends up to three-quarters of an hour in each home providing owners with advice on energy saving tips, developing a personal energy savings plan, and completing an Energy Partners Agreement with the customer.

Currently PG&E's program staff are experimenting with two pilot programs that may become incorporated into the program design in the future. The Blower Door Pilot was developed to test the appropriateness of using blower door equipment to determine optimal weatherization measures. In 1992, 1,392 blower door tests were completed. A Pen-Based Computer Pilot was tested in 88 of these homes to evaluate the effectiveness of creating a paperless program, a refinement that many utilities across the country may implement in the not-too-distant future!

Direct Assistance Programs

Utility:	Pacific Gas and Electric
Sector:	Low-income residential
Measures:	Attic insulation, weather stripping, showerheads, caulking, water heater blankets, duct wraps, fluorescent bulbs with electronic ballasts, outlet gaskets, faucet aerators, pipe wraps, refrigerators, evaporative coolers, furnaces, water heaters
Mechanism:	Low-income customers receive free residential weatherization as well as replacement of appliances
History:	Weatherization programs began in 1982, TCAP began in 1987

1992 Program Data

Energy savings:	16,283 MWh
Lifecycle energy savings:	244 GWh
Peak capacity savings:	4.91 MW
Cost:	$35,473,300

Cumulative Data (1987 - 1992)

Annual energy savings:	480 GWh
Lifecycle energy savings:	1,901 GWh
Peak capacity savings:	32.97 MW
Cost:	$245,408,500

Conventions

For the entire 1993 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.

Pacific Gas & Electric (PG&E) is an investor-owned gas and electric utility with a service territory that is broken down into 25 divisions and which encompasses 94,000 square miles in northern and central California. The utility is headquartered in San Francisco and had 26,600 employees in 1992. In 1992, PG&E served 4.3 million electric customers and 3.5 million gas customers. Electric sales represent approximately three-quarters of the company's total operating revenues.[R#1,2]

In 1992, PG&E's electricity supply came from three general sources: 58% from PG&E-owned and operated facilities, 22% from independently-operated Qualifying Facilities (QFs), and 20% from a variety of purchases and other production. A 22% contribution from QFs is relatively large compared to most other utilities and is the result of a deliberate effort by PG&E to diversify its electricity supply and expand the role of renewable energy.[R#2]

1992 PG&E SOURCES OF ELECTRIC ENERGY	
PG&E Owned	
Renewables	7.19%
Natural Gas	26.70%
Oil	0.10%
Geothermal	7.05%
Nuclear	16.82%
Subtotal	57.86%
Qualifying Facilities	
Cogeneration	12.88%
Hydro	1.70%
Geothermal	0.64%
Solar	0.22%
Wind	3.86%
Biomass	2.79%
Subtotal	22.09%
Other Purchases	20.05%

PG&E 1992 ELECTRIC STATISTICS	
Number of Customers	4,301,124
Electricity Sales	75,285 GWh
Electricity Sales Revenues	$7.198 billion
Summer Peak Demand	18,594 MW
Generating Capacity	19,902 MW
Reserve Margin	7 %
Average Electric Rates	
Residential	10.95 ¢/kWh
Commercial	10.14 ¢/kWh
Industrial	6.77 ¢/kWh
Agricultural	9.38 ¢/kWh

Electricity sales totaled 75,285 GWh in 1992 and provided the company with $7.2 billion in revenues. Total electric sales were up 1% over 1991, slightly below national averages. Residential customers accounted for 31.4% of sales, the commercial sector accounted for 34.9% of sales, the industrial sector accounted for 22.1% of sales, and the remaining 11.6% of sales were to other types of customers. In 1992 PG&E had 3,739,907 residential customers, 431,315 commercial customers, 1,193 industrial customers, 92,847 agricultural customers, and 15,862 other types of customers.[R#2]

The City of San Francisco, where PG&E's headquarters are located, has a population of 724,000, but the metropolitan "Bay area" is much larger. The local economy is based largely on electrical and machinery manufacturing. The City has an annual average temperature of 56.6°F and has average annual precipitation of 19.71 inches. Typically San Francisco has 3,161 heating degree days and 115 cooling degree days. ■

Utility DSM Overview

DSM Overview	*Annual C & LM Expenditure (x1,000)*	*Annual Energy Savings (GWh)*	*Annual Capacity Savings (MW)*	*Annual Gas Savings (Therms Millions)*
1976	$21,413	246	64	47
1977	$25,737	249	48	67
1978	$42,245	292	59	50
1979	$67,246	347	175	76
1980	$113,082	375	277	66
1981	$151,093	479	81	87
1982	$133,601	396	63	99
1983	$204,913	476	84	75
1984	$232,788	997	211	59
1985	$256,044	941	110	119
1986	$244,701	1,010	129	140
1987	$121,931	1,091	498	48
1988	$119,708	163	296	12
1989	$129,593	202	97	14
1990	$128,292	288	676	25
1991	$178,767	607	676	32
1992	$201,248	577	682	29
Total	$2,372,402	8,736	4,226	1,045

PG&E CURRENT DSM PROGRAMS

Residential

New Construction
Appliance Efficiency Incentives
Weatherization Retrofit Incentives
Direct Assistance
Energy Management Services
Information Programs

Nonresidential

Commercial New Construction
Nonresidential Energy Efficiency Incentive
Commercial Energy Management Services
Industrial Energy Management Services
Agricultural Energy Management Services
Nonresidential Information Programs

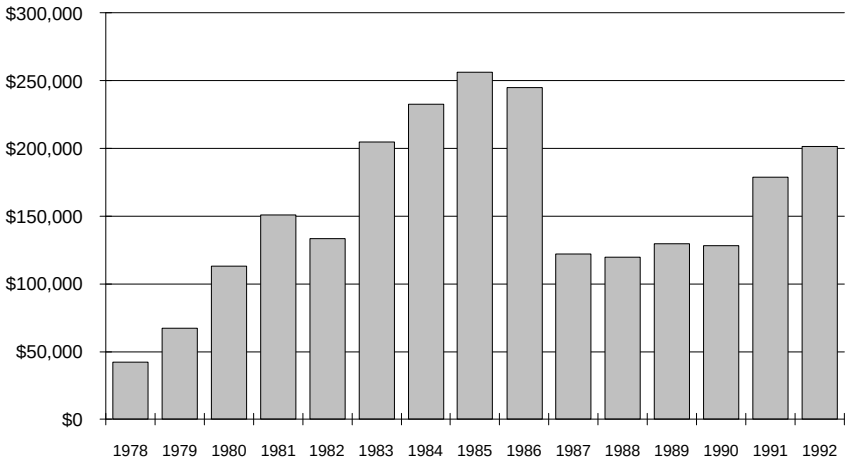
Other

Load Management Programs
Fuel Substitution
Load Retention and Load Building
CEE Demonstration Projects

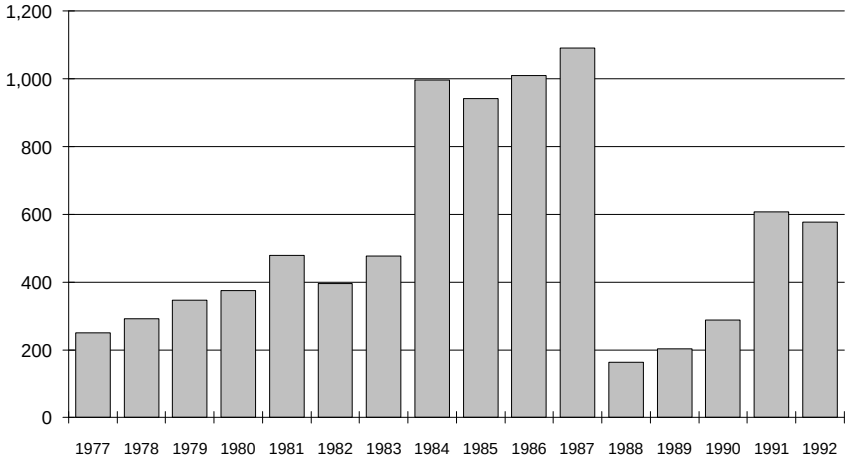
Pacific Gas & Electric has been a leading U.S. utility in the field of demand-side management (DSM) since 1976. Over the years the utility has spent more than $2 billion on its conservation and load management activities, including a small sum for solar DSM activities. In California DSM is defined in four ways: conservation, load management, fuel substitution, and load building and retention. The data presented in this section refers only to conservation and load management and represents both gas and electric expenditures and savings.

PG&E refers to its DSM programs as Customer Energy Efficiency (CEE) programs. These programs were significantly expanded in 1990 when the California Public Utilities Commission issued a decision authorizing the utility to implement new DSM programs and enhance existing ones. The combined goal of all CEE programs is to achieve a 2,500 MW reduction in peak electric demand growth by the year 2000. In 1992, CEE program expenditures were equal to 2.8% of the utility's total electric revenues. ■

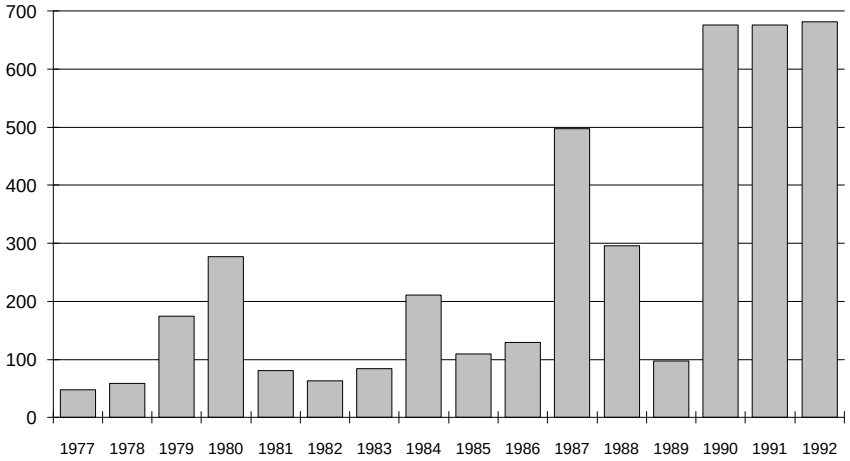
ANNUAL DSM EXPENDITURE ($1,000)



ANNUAL ENERGY SAVINGS (GWH)



ANNUAL CAPACITY SAVINGS (MW)



Program Overview

PG&E's has racked up an impressive track record in its decade of experience providing energy efficiency to low income homes through its Direct Assistance programs. To date, fully 631,427 housing units have been weatherized as a result of the program and the program maintains its momentum with more than 54,000 units weatherized in 1992. This section outlines the programs' evolution and outlines the current programs as offered by PG&E.

PROGRAM HISTORY

In November 1982, the California Public Utilities Commission (CPUC) approved a Direct Weatherization component of the Zero Interest Program (ZIP). The basic mission of the ZIP program was to provide residential customers with zero interest financing up to $3,500 for various conservation measures. The Direct Weatherization component, which eventually evolved into the current Energy Partners program, began by providing free installation of "Big Six" measures to single family, low income homes. These Big Six measures were mandated by California Senate Bill 845 and included attic insulation, weatherstripping, caulking, water heater blankets, low-flow showerheads, and duct insulation. The first homes were weatherized in February 1983.[R#4]

The Direct Weatherization program continued as part of ZIP until ZIP was terminated December 31, 1986. In 1987, the Direct Weatherization program was offered under the new Direct Assistance umbrella for low-income customers. Other weatherization programs implemented under this umbrella included the Low Cost Weatherization program and the Community Weatherization program. The Target Customer Appliance Program (TCAP) is another Direct Assistance program for low-income customers that also began in 1987.[R#4]

The Low Cost Weatherization program provided audits, education, and installation of energy-efficient showerheads, water heater blankets, fluorescent light bulbs, gaskets, aerators, weatherstripping, and caulking. This program was offered to selected urban areas where at least 60% of program participants had an income level of 80% or below that of the median area income. The Community Weatherization program was provided to rural communities where at least 66% of the customers qualified as low income. This program provided installation of Big Six measures as well as audits, repairs, and education.[R#4]

The Target Customer Appliance Program offered qualifying low-income customers replacement of old, inefficient appliances with new, more efficient ones at no cost to participating customers. Measures replaced in 1987 included refrigerators, evaporative coolers, and gas furnaces.[R#4]

In 1990, the three weatherization programs (Direct, Low Cost, and Community) were combined into a single Direct Weatherization program. This consolidation took place in order to serve a larger portion of the low-income market and to reduce program administrative costs by utilizing a single service approach. The TCAP program continued in its same form. In 1991, the Direct Weatherization program was formally titled the Energy Partners program.

CURRENT DIRECT ASSISTANCE PROGRAMS

Today PG&E's Direct Assistance programs help low-income customers control their energy consumption and costs by offering free energy reduction services and high-efficiency appliances and devices. Direct Assistance con-

sists of two programs: Energy Partners and the Target Customer Appliance Program (TCAP).[R#3]

PG&E continues to offer free weatherization to its low income customers through the Energy Partners program. The program includes installation of insulation, energy efficiency measures, and energy education. Up to $200 in minor home repairs (in addition to installation of insulation and energy efficiency measures) in single family homes, mobile homes, and multi-family apartments are provided. As their homes are being evaluated, program participants are educated about energy-efficiency opportunities. Installed measures include both "Big Six" and Non "Big Six" measures (fluorescent bulbs, outlet gaskets, faucet aerators, home repairs, pipe wraps, furnace filters, and evaporative cooler covers). Private and community-based organizations are contracted to provide the weatherization services.[R#3]

The TCAP program continues much as did when it was introduced in 1987. Almost 10,000 refrigerators were replaced in 1992 along with 604 evaporative coolers, 1,414 furnaces, 683 water heaters and 10,000 compact fluorescent bulbs.[R#3]

In addition to the core Energy Partners and TCAP programs there are several pilot programs that are off-shoots of the program. Pilot programs begun in 1991 and continued in 1992 include: housing rehabilitation done through joint government/private sector projects which allows PG&E funds to be leveraged with other sources, providing weatherization to homes otherwise not reached; low-income multi-cultural marketing through community-based organizations; and development of a national standard for weatherization of mobile homes done in cooperation with other utilities and various state departments. In 1992, more than 1,000 homes were weatherized using blower door technology in various pilot programs and PG&E experimented with the use of a pen-based computer system for the Energy Partners program. In total, the various pilot programs provided weatherization for an additional 6,000 homes in 1992.[R#3]

While PG&E currently has two Direct Assistance programs (Energy Partners and TCAP), this profile will focus primarily on the Energy Partners program. This emphasis is due to the fact that PG&E spends a great deal more money on the Energy Partners program and participation levels are considerably higher for the Energy Partners program. For 1994, PG&E plans to combine the Energy Partners and TCAP programs into a single Direct Assistance program as well as restricting the TCAP component to replacement of refrigerators only.[R#5] ■

PG&E's Direct Assistance currently has two components: the Energy Partners program and the Target Customer Appliance Program (TCAP). This section will discuss the marketing and implementation of each program separately.

MARKETING THE ENERGY PARTNERS PROGRAM

Marketing of the Energy Partners program is the responsibility of program contractors. Marketing approaches among contractors vary based on the demographics of the selected target areas and the experience of the contractors. Contractors are free to select the marketing techniques they believe will be most effective. The most widely used marketing methods include door-to-door canvassing, followed by promotion to or through community organizations, and word of mouth. Other methods include phone canvassing, mailers, and posters.[R#7]

PG&E produces and provides marketing materials to Energy Specialists. These materials include cards which can be placed in customer mail boxes telling customers to expect an Energy Specialist soon. Other PG&E brochures explain the details of the Energy Partners program. These brochures are available in more than six languages. If customers are not home when an Energy Specialist arrives, a post card is left which explains the program, promises a return visit, and encourages participation. A phone number for additional information is also provided.[R#6]

DELIVERING THE ENERGY PARTNERS PROGRAM

PG&E uses both community-based organizations and private contractors to implement the Energy Partners program. For customers interested in the program, an initial customer visit is made by an Energy Specialist (contractor) who gathers customer demographic information; explains the Energy Partners program; conducts a walk-through audit of the home; completes an Energy Survey Input Sheet (ESIS); shows what energy improvements can be made in the home; and explains how much energy different appliances use. The Energy Specialist also provides energy cost cutting tips; explains the PG&E bill; develops a personal energy savings plan; and completes an Energy Partners Agreement with the customer. On average customers receive 48 minutes of energy education during this visit.[R#7]

After the Energy Specialist evaluates the customer's needs, a PG&E approved contractor is sent to install the weatherization and energy saving measures. Weatherization work must begin within 15 days of providing the education and assessment (30 days for multi-unit dwellings) and once started must be completed within five working days. The weatherization work must conform to the standards published in the "Weatherization Installation Standards" manual. An invoicing disk is sent to Data Image Systems Corporation (DISC) within ten days for processing. An inspection work order is then sent to the PG&E Division for that particular service area, which triggers inspection by PG&E or their subcontracted inspectors from DMC Services, an energy service company headquartered in Boston, Massachusetts. If the home fails inspection, appropriate corrective actions are taken by the contractor and the home is then reinspected where necessary.[R#6,7]

Approximately two weeks after the initial customer visit, PG&E provides customers a free computerized analysis of monthly and annual energy use for the past year. Gas and electric expenditures are also separated on a monthly basis. A break out of energy costs by major ap-

pliances is also provided and energy saving recommendations along with projected corresponding dollar savings are included. Not only are these materials informative but they are easy to read and graphically pleasing.[R#5,6]

For previous PG&E Direct Weatherization programs, individual eligibility was based strictly on the individual household's income level. With the Energy Partners program eligibility is based on the household being located within the geographic bounds of selected project areas, or what are called "census tracts." This change was made in order to reduce costs associated with canvassing, marketing, and income verification. PG&E Division representatives, PG&E General Offices, and occasionally contractors are involved in the area selection process. All residents in the selected geographic areas are eligible for program services regardless of family income. While it is possible that this new program eligibility mechanism allows participation by higher income customers than are targeted by the program, it also allows more working poor and marginally poor senior citizens to receive program services.[R#7]

Differences in implementation of the program between neighborhoods or areas are largely a function of demographics including: housing stock; levels of income; urban versus rural areas and the related density of homes; and age of residents. These differences affect the type of marketing techniques; scheduling of canvassing and installation; and overall success of the program.[R#7]

Significant quality control and quality assurance procedures are built into the Energy Partners program. The most important quality control procedure is the post-inspection conducted by either PG&E or DMC staff. Contractors can and often do provide their own quality assurance before, during, and after weatherization, including ride-alongs and inspections by field supervisors of installations in progress.[R#7]

Program training is provided at PG&E's Stockton Training Center in periodic contractor and Energy Specialist training sessions. Te be certified as an Energy Specialist (inspector, auditor, and educator), one must go through an intensive three-week training course. Updates to program policies and procedures or standards are provided in periodic cluster meetings conducted by PG&E General Offices and attended by contractors, PG&E Divisions staff, Richard Heath and Associates (the contracted program administrators), and other General Office staff.[R#7]

ENERGY PARTNERS PROGRAM STRUCTURE

The Energy Partners program has a fairly complex structure necessary to support a program of this magnitude. Most program functions are provided by contractors to PG&E with PG&E providing any necessary policy determinations. Specifically:

- The energy education and weatherization installation services are coordinated and provided entirely by the individual contractors in the communities.[R#7]

- Program administration functions are performed primarily by Richard Heath & Associates (RHA), including acting as liaison to provide policy and procedures information, mediating disputes, and conducting quality assurance (QA).[R#7]

- The final arbiter of policy or procedure questions and questions regarding weatherization and education standards is PG&E's General Office (GO).[R#7] ☞

• The PG&E Divisions (service area divisions) are responsible for post-inspection services, either using PG&E employees or contracted employees from DMC.[R#7]

• Invoice processing and inspection tracking is provided by Data Image Systems Corporation (DISC).[R#7]

• The follow-up bill disaggregation (EnerGraf) is produced by the consulting firm, A&C Enercom, using billing histories provided to them by PG&E's Customer Services Processing Center (CSPC).[R#7]

• Other parties include Intraline which provides marketing and weatherization materials to contractors and installers, and C. Nelson & Company, the program's fiscal agent.[R#7]

MARKETING & DELIVERY: TARGET CUSTOMER APPLIANCE PROGRAM (TCAP)

Marketing for the TCAP program is almost entirely word of mouth. In order to qualify for the TCAP program customers must have an income equal to or below 150% of the poverty level. Senior citizens are eligible if their income is 200% of the poverty level or below. Interested customers must self certify themselves by filling out a program application verifying their income. Typically applicants attach a check stub from a welfare agency to prove program eligibility. Once PG&E approves the application, a PG&E contractor makes an appointment to provide new appliances at no charge to the customer. Refrigerators are the most commonly installed appliance, and in 1993 the installed refrigerators had to be 30% above federal standards. The contractor removes the old refrigerator when the new refrigerator is installed.[R#5]

MEASURES INSTALLED

Installed measures for the Energy Partners program are divided into two categories: "Big Six" mandated by California Senate Bill 845, and "Non Big Six." "Big Six" measures are attic insulation (up to R30 in some areas), weather stripping, energy-efficient showerheads, caulking, water heater blankets, and duct wraps. "Non Big Six" measures include fluorescent bulbs with electronic ballasts (two per home), outlet gaskets, faucet aerators, minor home repairs up to $200 per unit, pipe wraps, reusable furnace filters, furnace filter alarm devices which remind customers to clean or replace filters, and evaporative cooler covers.[R#3]

Measures installed through TCAP include refrigerators, evaporative coolers, furnaces, water heaters, and compact flourescents. With the TCAP program a single cfl is installed during each post inspection.[R#3,4]

STAFFING REQUIREMENTS

Jeff Crowe is the program manager and devotes all his time to the Direct Assistance programs. There is also a full-time product manager for the programs. From the planning department there are 1.5 full time equivalents (FTEs) working on the programs. In addition there are 46 FTEs who are responsible for dealing with contractors. There are approximately 43 contractors working on the programs, with 50% from the private sector and 50% community-based organizations.[R#5] ■

MONITORING

Data for the Energy Partners program is tracked in two databases. The "invoice" database contains the information recorded on the Energy Partners invoice including measures installed and total costs and is maintained by Data Image Systems Corporation (DISC), a private, independent company. DISC also monitors inspection reporting. DISC processes invoices supplied by the contractors and generates the Weatherization Inspection Reports (WIR) that are forwarded to the Divisions to trigger on-site inspections. At that time, the Division representative notifies an inspector who in turn inspects the home and records the appropriate pass/fail codes for each installed measure. Once the home passes inspection the WIR is returned to DISC and the job is considered closed.[R#7]

A&C Enercom maintains the data recorded on the Energy Survey Input Sheet (ESIS), primarily relating to the types of energy-using equipment in the home. The ESIS form is completed by the Energy Specialist and contains information on household characteristics and energy using equipment in place. The form is sent to PG&E's Customer Services Processing Center (CSPS) where customer billing data is downloaded to disk. Both the ESIS form and the billing histories are then forwarded to A&C Enercom. A bill disaggregation analysis (EnerGraf) is prepared by A&C Enercom and then mailed directly to the customer.[R#7]

Although Richard Heath & Associates does not utilize a database to track program data they do produce several reports relating to quality assurance. These reports summarize results of customer phone surveys and ride-alongs with Energy Specialists.[R#7]

Random inspections are performed by PG&E on 20% of all groundwork only installations. All units with attic insulation are inspected.[R#7]

EVALUATION

Typically PG&E produces a program evaluation whenever the utility is preparing for a rate case. A process evaluation of Energy Partners was completed in July 1993 for PG&E by Synergic Resources Corporation of Bala Cynwood, Pennsylvania. This evaluation also briefly examined the 1992 Blower Door and Pen-Based Computer System pilot programs. The study evaluates the Energy Partners program during 1991 and 1992, its first two years of full-scale operation following the consolidation of the Direct Weatherization programs.

PG&E also publishes an Annual Summary Report on Demand-Side Management Programs in March of each year called "the March 31st report." These reports contain total DSM expenditures and savings along with brief individual summaries of each DSM program and are prepared for the California Public Utilities Commission. [R#4,7]

The process evaluation was based on surveys of Energy Partners staff and customer participants. Specifically, in-depth telephone surveys were conducted with 24 Energy Partners program staff members, including PG&E program staff, non-PG&E administrators, and contractors. Telephone surveys with 1,528 1991 and 1992 program participants were completed. The sample for the survey was stratified by year of participation and service area division.[R#7]

The process evaluation had many key findings including:

• Customer satisfaction with the Energy Partners program is very high with 83.7% of participants saying they were very satisfied with the program. An even higher percentage of respondents (94.1%) said they would be more likely to participate in future PG&E programs after their experience with the Energy Partners program. The primary reasons customers cited for liking the program include the fact that it is free, they save money through energy savings, and they receive useful energy saving recommendations.[R#7]

• Approximately 10% of customers said they had some type of problem with the program. The quality of workmanship and the attitude of workers were the most frequently mentioned.[R#7] ☞

• Almost 15% of respondents said they have removed or stopped using some equipment installed through the program. The most frequently removed equipment included low-flow showerheads, compact fluorescent lightbulbs, and faucet aerators.[R#7]

• The process evaluation found the integrity of program data to be very high. The vast majority of database fields were found to have minimal errors. One downside to the datasets is that they are accessible only to DISC and A&C Enercom staff. Although Energy Partners program management has the ability to request additional data and reports, they do not have direct access. In addition, the process of downloading, converting, and reconciling the data makes program evaluation cumbersome.[R#7]

In 1992, 1,392 blower door tests were completed and a pen-based computer was used in 88 of these homes. The Blower Door Pilot was developed to test the appropriateness and cost-effectiveness of using blower door equipment as part of the Energy Partners program. The Pen-Based Computer pilot was designed with the goal of creating a paperless program. Initial problems with the Pen-Based Computer pilot included a short battery life for the portable computers; slow processing speed; poor print quality; and the software was not judged to be very user friendly. PG&E staff believe that these problems can be overcome relatively easily.[R#7]

In September 1993, Synergic Resources Corporation also completed an impact evaluation of the Energy Partners program for PG&E. The primary objective of this evaluation was to estimate the annual energy savings attributable to 1991 program activities, specifically installations performed in 1991. Gross annual energy savings per participant were estimated in a statistical analysis of characteristics data and electric and natural gas consumption billing histories for a sample of 305 program participants and a comparison of 301 non-participating customers. A less detailed analysis of electric and natural gas consumption data for samples of more than 1,500 participants and 1,400 comparison group customers was conducted to validate the primary savings estimates.[R#8]

Specifically, data collection consisted of: monthly electric and gas billing data for 1,500 participants and 1,400 non-participants for the years 1990 and 1992; a telephone survey of 305 participants and 301 non-participants; and daily outdoor temperature data for 1983 - 1992. The sample for the survey was stratified by PG&E Division.[R#8]

The evaluation calculated both gross and net savings for the program. Gross annual energy savings for single family units with air conditioning (AC) were calculated to be 224 kWh and 24.9 therms, while gross savings for single family units without AC were 130 kWh and 24.9 therms. Gross annual energy savings for multi-family units with AC came in at 351 kWh and 17.8 therms, and gross savings for multi-family units without AC were 134 kWh and 17.8 therms. Net annual energy savings were calculated as follows: single family units with AC 206 kWh and 22.9 therms, single family units without AC 120 kWh and 22.9 therms, multi-family units with AC 323 kWh and 16.4 therms, and multi-family units without AC 123 kWh and 16.4 therms.[R#8]

A summary of the results from the survey of the approximately 1,500 participants and approximately 1,400 non-participants showed weather normalized annual consumption (NAC) for participants to decrease from 6,175 kWh in 1990 to 5,977 kWh in 1992, while non-participant energy use increased from 6,152 kWh in 1990 to 6,195 kWh in 1992, creating gross energy savings of 240 kWh. Gas use for program participants decreased slightly from a NAC of 585.09 therms in 1990 to 584.94 therms in 1992, and gas use for non-participants increased from 579.61 therms in 1990 to 598.88 therms in 1992, for gross savings of 19.43 therms. These figures indicate that savings per home are less than 5%.[R#8]

Statistical estimates of net savings were lower than PG&E's filed estimates for both electricity savings in the single-family with air conditioning sub-group and all gas savings. These differences were attributed to a lack of measure retention as well as the types of installed measures in these homes.[R#8]

Estimates of the free rider rate (estimated to be 8%) were developed from survey data collected from the 305 participants analyzed for the gross savings estimation. Responses to survey questions were tabulated to determine potential free ridership rates for each participant for each measure, which in turn were used to subjectively calculate the 8% free rider rate for the program as a whole. In addition the evaluation estimates free ridership for electric only measures to be 6% and gas only measures to be 9%. Net savings estimates were calculated by combining gross savings estimates with the overall free rider rate.[R#8] ■

Total annual savings figures in the accompanying tables for 1987 through 1992 reflect all of the Direct Assistance programs, Weatherization plus TCAP. For certain years PG&E separated savings figures for the two program types and other years they did not.

The utility does not report free ridership per se but instead reports "net-to-gross impacts." Net-to-gross is the ratio between the program impacts for which the utility can assume credit (net) and the total program impacts (gross) including those that would have taken place without the program. A 1993 impact evaluation of the Energy Partners program estimated an overall free ridership level of 8%. The savings figures presented in this profile are designated as net savings by PG&E.[R#3,4,8]

In 1992, the Direct Assistance programs accounted for 16,283 MWh of energy savings, 4.91 MW of peak capacity savings, and 3.66 million therms of gas savings. The Energy Partners program had savings of 9,925 MWh (61% of Direct Assistance energy savings), 1.81 MW, and 3.6 million therms. The TCAP program had savings of 6,358 MWh, 3.1 MW, and 34,000 therms.[R#3]

From 1987 through 1992 PG&E's Direct Assistance programs had total annual energy savings of 126,732 MWh and cumulative energy savings of 479,659 MWh. Annual peak capacity savings for the same period total 32.97 MW, and annual gas savings were 27.46 million therms.[R#3,4]

PARTICIPATION RATES

There are two types of participants in the Direct Assistance programs. For the Energy Partners program participants are defined as the number of housing units receiving weatherization services. During 1992, a total of 54,876 units were weatherized out of a goal of 55,000. A total of 631,427 units were weatherized between 1983 and 1992.

Participation Energy Partners	*Participants*	*Annual Energy Savings per Participant (kWh)*
1983	25,387	NA
1984	38,127	NA
1985	40,831	NA
1986	44,056	NA
1987	89,226	202
1988	100,489	200
1989	111,678	198
1990	60,757	198
1991	66,000	163
1992	54,876	211
Total	631,427	

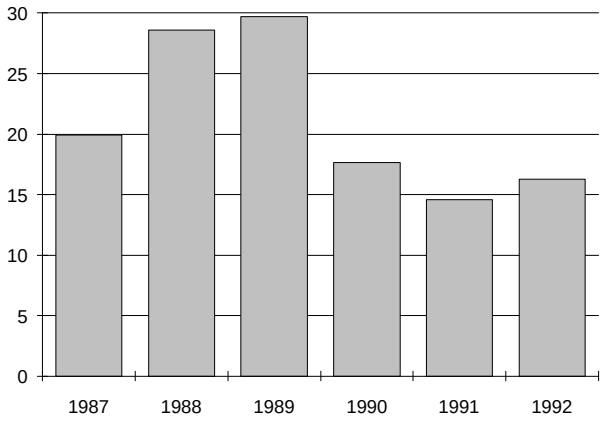
For the TCAP program participants are defined as the total number of installed measures. Please note that this definition will lead to some double counting due to the fact that many homes replaced more than one type of measure. From 1987 through 1992 a total of 164,408 ☞

Participation TCAP	*Refrigerators*	*Evaporative Coolers*	*Furnaces*	*Water Heaters*	*CFLs*	*Annual Total*
1987	4,000	580	76	0	4,500	9,156
1988	16,987	3,372	893	0	21,252	42,504
1989	13,490	4,321	7,786	65	13,000	38,662
1990	11,329	1,934	2,157	24	13,000	28,444
1991	10,707	520	1,450	508	10,000	23,185
1992	9,756	604	1,414	683	10,000	22,457
Total	66,269	11,331	13,776	1,280	71,752	164,408

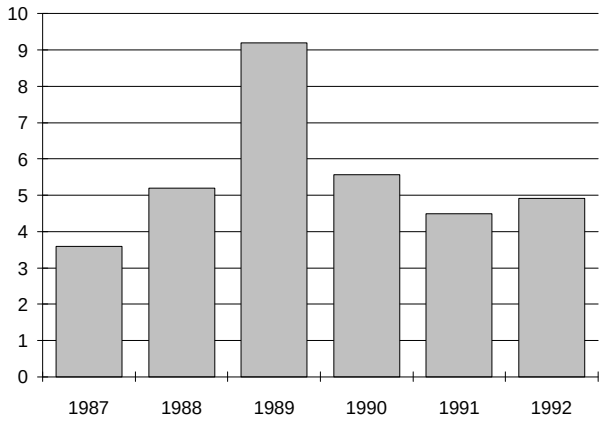
Savings Overview	*Annual Energy Savings (MWh)*	*Cumulative Energy Savings (MWh)*	*Lifecycle Energy Savings (MWh)*	*Annual Peak Capacity Savings (MW)*	*Cumulative Peak Capacity Savings (MW)*	*Annual Gas Savings (Million Therms)*	*Cumulative Gas Savings (Million Therms)*
1987	19,900	19,900	298,500	3.60	3.60	5.47	5.47
1988	28,600	48,500	429,000	5.20	8.80	4.50	9.97
1989	29,700	78,200	445,500	9.20	18.00	5.30	15.27
1990	17,678	95,878	265,170	5.56	23.56	4.00	19.27
1991	14,571	110,449	218,565	4.50	28.06	4.53	23.80
1992	16,283	126,732	244,245	4.91	32.97	3.66	27.46
Total	126,732	479,659	1,900,980	32.97		27.46	101.24

Data Alert: Savings figures for PG&E's Direct Weatherization program for 1983 through 1986 are not presented because they were bundled with the ZIP program savings figures.

ANNUAL ENERGY SAVINGS (GWH)



ANNUAL PEAK CAPACITY SAVINGS (MW)



measures have been installed through the TCAP program with 22,457 measures (9,756 refrigerators, 604 evaporative coolers, 1,414 furnaces, 683 water heaters, and 10,000 compact fluorescent lamps) installed in 1992. A total of 66,269 refrigerators have been replaced through this program.[R#3,4]

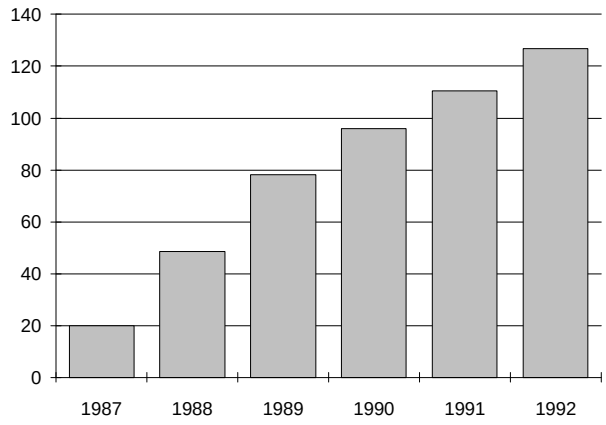
In order to provide for some indication of the relative average annual energy savings per participant, in the absence of robust data, The Results Center has calculated annual energy savings per participant based on annual energy savings for all Direct Assistance programs divided by the total number of participants for both the Energy Partners and TCAP programs. Annual energy savings per participant range from a low of 198 kWh in both 1989 and 1990 to a high of 211 kWh in 1992. The Energy Partners program alone had energy savings of 180 kWh per unit, while the TCAP program had savings of 283 kWh per installed measure in 1992. It is also interesting to note that the Energy Partners program achieves energy savings of less than 5% per home on average.

PG&E's participation goal in 1993 for the Energy Partners component was 41,000 units and the utility hoped to install 37,579 measures through the TCAP program.[R#3]

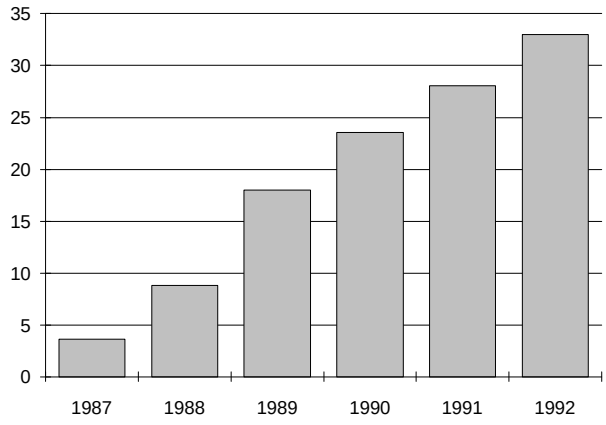
MEASURE LIFETIME

The Results Center calculated an average measure lifetime for PG&E's Direct Assistance programs based on PG&E's 1992 projected lifecycle energy savings divided by 1992 annual energy savings, creating a measure lifetime of 15 years. This measure lifetime is somewhat higher than that used for other low-income programs profiled by The Results Center (see Profiles #2,15,22,49), where lifetimes range from 6 to 10 years but seems appropriate given the program's emphasis on relatively-durable weatherization measures.[R#3] ■

CUMULATIVE ENERGY SAVINGS (GWH)



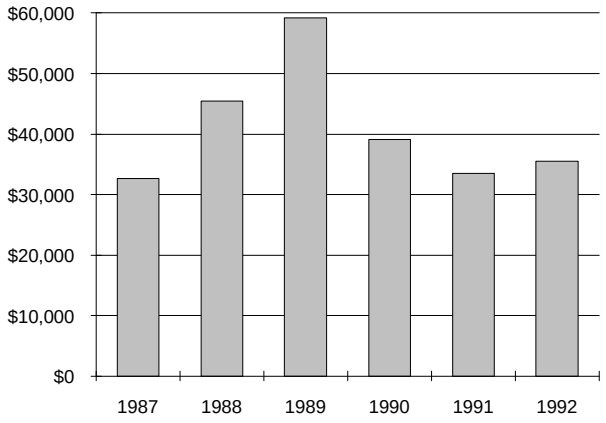
CUMULATIVE PEAK CAPACITY SAVINGS (MW)



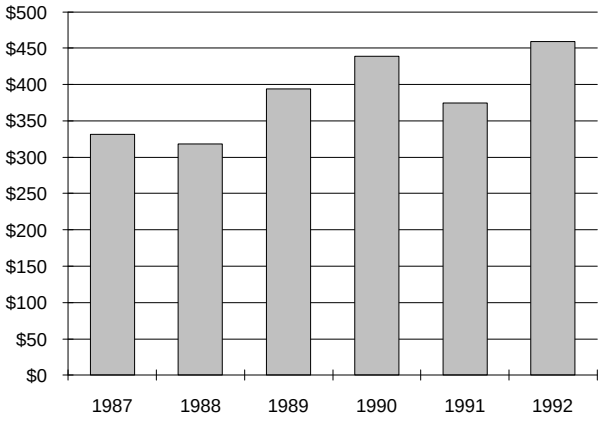
Cost of the Program

Costs Overview	*Electric (x1000)*	*Gas (x1000)*	*Total Program Cost (x1000)*	*Cost per Participant*
1987	$2,670.4	$29,965.5	$32,635.9	$331.73
1988	$10,543.3	$34,963.1	$45,506.4	$318.24
1989	$22,779.7	$36,409.4	$59,189.2	$393.70
1990	$19,429.8	$19,728.2	$39,158.0	$438.99
1991	NA	NA	$33,445.7	$375.02
1992	$18,321.5	$17,151.8	$35,473.3	$458.71
Total	$73,744.7	$138,218.0	$245,408.5	

TOTAL PROGRAM COST (x1,000)



COST PER PARTICIPANT



Data Alert: Program cost figures for PG&E's Direct Weatherization program for 1983 through 1986 are not presented because they were bundled with the ZIP program cost figures.

Annual program costs in the accompanying tables for 1987 through 1992 reflect expenditures for all of the Direct Assistance programs, Weatherization (currently titled Energy Partners) plus TCAP. Where possible the weatherization and TCAP expenditures are presented separately.

In 1992 PG&E spent a total of $35,473,300 on its Direct Assistance programs with $27,492,069 spent on Energy partners and $7,981,231 spent on TCAP. From 1987 through 1992, a total of $245,408,500 was spent on direct assistance programs. The program's total budget for 1993 was $39,179,000.[R#3,4]

The amount of money that PG&E has invested in its Direct Assistance programs is perhaps the most impressive aspect of the programs. Both annual and total expenditures for other low-income programs profiled by The Results Center pale in comparison. Of all previous low

Cost of Saved Energy (¢/kWh)	Discount Rates						
	3%	4%	5%	6%	7%	8%	9%
Electric and Gas Savings							
1987	1.52	1.63	1.75	1.87	1.99	2.12	2.25
1988	2.38	2.55	2.73	2.92	3.11	3.31	3.52
1989	2.68	2.88	3.08	3.29	3.51	3.74	3.97
1990	2.43	2.61	2.80	2.99	3.19	3.39	3.60
1991	1.90	2.04	2.19	2.34	2.49	2.65	2.82
1992	2.41	2.58	2.77	2.96	3.15	3.36	3.56

income programs profiled by The Results Center, Seattle City Light has spent the most money with approximately $40 million spent over 10 years.

COST EFFECTIVENESS

Based on the total resource cost (TRC) test, PG&E calculated a benefit cost ratio of 0.77 for its Direct Assistance programs in 1992. Using the Ratepayer Impact Measure (RIM) test a ratio of 0.40 was calculated for 1992. Despite these unattractive B/C levels, both PG&E and the California Public Utilities Commission steadfastly support the program given its social importance and ability to deliver electricity and gas savings to a customer class very much in need of bill relief.[R#3]

The Results Center calculated the cost of saved energy for PG&E's Direct Assistance programs based on total program costs and both gas and electric savings. Gas savings were converted using the formula one therm = 29.30 kWh.

Using both gas and electric savings the cost of saved energy ranges from a low of 1.75 ¢/kWh in 1987, to a high of 3.08 ¢/kWh in 1989, and a 1992 rate of 2.77 ¢/kWh.

COST PER PARTICIPANT

The cost per participant for all Direct Assistance programs from 1987 through 1992 ranges from $318 in 1988 to $458 in 1992. (See Program Savings for a definition of participants.)

COST COMPONENTS

From 1987 through 1992 PG&E spent a total of $73,744,700 on the electric component of its Direct Assistance programs and $138,218,000 on the gas component. (Note that these figures do not include 1991 data breakouts which are unavailable). In 1992, the utility spent $17,151,800 on the gas component, including $878,928 on labor and $16.272 million on non-labor. Expenditures on the electric component of the program for 1992 totaled $18,321,500, with $2,722,263 for labor and $15.599 million for non-labor expenses. ■

Environmental Benefit Statement

AVOIDED EMISSIONS: Based on 479,659,000 kWh saved 1987 - 1992

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%	1,034,145,000	24,535,000	4,960,000	496,000
B	10,000	1.20%	1,102,736,000	9,497,000	3,203,000	2,374,000
	Controlled Emissions					
A	9,400	2.50%	1,034,145,000	2,453,000	4,960,000	40,000
B	10,000	1.20%	1,102,736,000	950,000	3,203,000	158,000
C	10,000		1,102,736,000	6,331,000	3,166,000	158,000
	Atmospheric Fluidized Bed Combustion					
A	10,000	1.10%	1,102,736,000	2,902,000	1,583,000	791,000
B	9,400	2.50%	1,034,145,000	2,453,000	1,984,000	149,000
	Integrated Gasification Combined Cycle					
A	10,000	0.45%	1,102,736,000	1,952,000	317,000	791,000
B	9,010		991,935,000	707,000	238,000	48,000
Gas	**Steam**					
A	10,400		601,492,000	0	1,372,000	0
B	9,224		522,349,000	0	3,271,000	155,000
	Combined Cycle					
1. Existing	9,000		522,349,000	0	2,005,000	0
2. NSPS*	9,000		522,349,000	0	950,000	0
3. BACT*	9,000		522,349,000	0	132,000	0
Oil	**Steam--#6 Oil**					
A	9,840	2.00%	870,581,000	13,191,000	1,556,000	1,477,000
B	10,400	2.20%	923,344,000	13,085,000	1,957,000	950,000
C	10,400	1.00%	923,344,000	1,868,000	1,572,000	496,000
D	10,400	0.50%	923,344,000	5,487,000	1,957,000	302,000
	Combustion Turbine					
#2 Diesel	13,600	0.30%	1,155,499,000	2,300,000	3,572,000	195,000
Refuse Derived Fuel						
Conventional	15,000	0.20%	1,371,825,000	3,535,000	4,654,000	1,034,000

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 accomanying page is to allow any user of this profile to apply PG&E's level of avoided emissions saved through its Direct Assistance 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.

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

Perhaps the most impressive aspect of the Direct Assistance programs is the tremendous amount of money that PG&E has poured into them. Having spent almost $250 million on the programs between 1987 and 1992, while weatherizing more than 630,000 housing units (1983 - 1992), PG&E's Direct Assistance programs operate on a scale that is unparalleled by other low-income programs. This high level of spending is especially impressive when taking into account the relative lack of cost effectiveness from the TRC and RIM test point of view. PG&E believes that the cost effectiveness of the program is severely impaired by the mandated "Big Six" measures. Nonetheless, the utility continues the program due to the important social function that it fulfills.

One of the natural tendencies for a program of this size is for it to become bogged down in administration. To a degree, this program certainly has. For instance, the complexity of the program organization sometimes makes it difficult for contractors to find immediate answers to their problems and/or policy questions. The program manager is responsible for dealing with policy questions and answering contractor questions but also has many other responsibilities. The vast duties of the program manager make it difficult to respond to all questions in a timely manner.[R#7]

One major issue that program planners at PG&E have is whether the education component of the program has actually worked. To date, average energy savings of only 5% per home have been achieved, which is not much bang for the buck. PG&E is convinced that better customer education can be responsible for dramatic increases in savings. Thus if its educational component that provides homeowners with energy saving tips, etc., works, the program's impact could be far larger over time than the rather nominal energy savings presented.[R#5]

PG&E's current focus is to try to run its Direct Assistance programs more like a business than has been done in the past. This goal is largely in response to the issue of ratepayer expenditures and equity of service. Currently the utility is looking at expenditures by measure. It has determined that weatherstripping and caulking account for very little in the way of energy savings.[R#5]

The utility emphasizes the importance of quality assurance, believing that if there is no quality assurance there is no DSM. Other keys to success that PG&E is trying to improve on include program marketing and evaluation.[R#5]

The 1993 process evaluation of the Energy Partners program contained several recommendations for improving the program including:

- Clearly define for the contractors and all other parties the appropriate channels for resolution of problems or questions. It is also recommended that more clear and frequent updates on policy interpretations be provided by the PG&E General Office to PG&E service territory Divisions by providing the Program Assistant and/or Division Liaisons with the necessary tools and authority.[R#7]

- Increase the frequency and general level of communication between contractors, RHA, and PG&E, especially regarding questions or problems with standards and inspections. Try to improve the flow from one project year to the next so contractors can retain their more experienced Energy Specialists and installers.[R#7]

• Schedule training at times of the year more convenient to contractors. Training typically occurs at the beginning of a contract when production is assumed to have begun, or during the summer when production is in full swing. This training should include more hands-on training, perhaps including a video walk-through audit. Finally, provide frequent opportunities for positive, non-adversarial exchange through one-on-one or group meetings between contractors and program administrators to discuss policies and maintenance of installation standards.[R#7]

• Currently contractors do not receive much feedback on how they are performing relative to other contractors, and have not developed the types of working relationships with other contractors which might prove useful in discussing and finding solutions to common problems. The process evaluation recommends that system-wide information be compiled on inspection fail rates by measure in order to identify any problems which are measure specific rather than contractor specific. Similarly it might be useful to arrange meetings for contractors to share program experiences.[R#7]

TRANSFERABILITY

Low-income community weatherization programs have been implemented successfully in a variety of locations throughout the United States (See The Results Center Profiles #2, 15, 20, 22, 49, and 61). These programs provide an important social function and garner relatively low cost energy savings in the process.

One major advantage that PG&E has over other utilities implementing similar programs is that it is both a gas and electric utility. This allows the installation of all possible energy-efficiency measures during one contractor visit, maximizing energy savings without concern for whether gas or electric savings are achieved. Of course, being a dual-fuel utility is not a prerequisite for such success. Note the experience that United Illuminating has had working with Southern Connecticut Gas Company (See Profile #15).

Traditionally low-income programs base eligibility strictly on household income. Instead PG&E bases eligibility on location of the residence with low-income areas targeted in an attempt to keep program costs low. While most participants would qualify under "traditional" guidelines, many working poor are now eligible for the program who wouldn't have been otherwise (see The Results Center Profile #22 for a low-income program with a similar eligibility standard.)

While the implementation and installed measures of PG&E's Direct Assistance programs might not be especially unique, these programs are very unusual based on their extremely high cost and participation levels. ■

Regulatory Incentives and Shareholder Returns

Traditional utility ratemaking, 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 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 exciting and innovative incentive ratemaking mechanisms where they're 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 we hope will provide useful snapshots of incentive mechanisms being used and tested across the United States. (Note that the dollar values in this section have not been levelized.)

STATE OVERVIEW

Beginning in the late 1970s and extending into the early 1980s, California was the leading state in terms of its promotion of energy efficiency. Despite a hiatus from this focus in the mid-1980s, California is now among the most innovative and progressive states in utility regulation for energy efficiency purposes. Utilities are required to file biennial resource plan updates incorporating the State's integrated cost-effectiveness methodology (ICEM). A 1989 California Public Utilities Commission (CPUC) decision refined the IRP process and governs current practice.

The bulk of current DSM regulatory practice was formulated in the California Collaborative of 1990 that involved California's four major investor-owned utilities, numerous interveners, and the California Energy Commission and Public Utility Commission. Under the Collaborative agreement cost recovery, lost revenue treatment, and shareholder incentives were addressed for all of the participating utilities. Specific PG&E provisions are covered in the following sections.

Additionally, the CPUC has been holding an ongoing proceeding since August, 1991 to address demand-side management policy issues. The DSM "OII/OIR" proceeding is expected to have substantial effects on the way DSM is performed and treated in California. Interim rulings under this proceeding have included guidelines for cost-effective screening, measurement and evaluation issues, and bidding program regulation. Further, much of the regulation addressing shareholder incentives that are currently being modified has arisen from consideration under OII/OIR.

UTILITY OVERVIEW

Pacific Gas & Electric has three kinds of demand-side management programs in terms of regulation: Resource programs, Equity and Service programs, and Expense-only programs. Expense-only programs are not eligible for shareholder incentives while the other two classes are. Examples of this kind of program include load management, load retention, and information programs. Note however, that Expense-only program costs are recovered by the utility but no return on equity is awarded to the utility's shareholders.

Resource programs are viewed as cost-effective alternatives to supply-side resources and are thus valuable as "resources" to the utility. These include programs for which energy and capacity benefits can be quantified in a reasonably accurate manner. Examples include commercial and industrial incentive programs and residential appliance programs.

Equity and Service programs are primarily designed to meet the needs of selected customer classes such as low-income customers, or are programs that do not produce easily quantifiable energy savings, such as educational efforts. However, the utility and CPUC have recognized that these programs are valuable beyond their energy impacts in areas such as education that may lead to substantial future efficiency benefits and customer service.

TREATMENT OF DSM EXPENDITURES

PG&E is able to recover the costs of its DSM programs through allocations to all customer classes. Marginal revenues and revenue requirements are reconciled in this

process through the use of a two-way balancing account for expenditures.

The utility is able to request changes to rates in an Electric Cost Adjustment Clause (ECAC) or a gas reasonableness review, depending on the fuel. Additionally, the utility may bundle its requests into one proceeding.

TREATMENT OF LOST REVENUES

The Electric Revenue Adjustment Mechanism (ERAM) effectively decouples utility revenues from sales of electricity. ERAM is a balancing account that reconciles base utility revenues with authorized amounts from the previous rate case. ERAM is adjusted annually through an attrition proceeding to address certain cost changes.

TREATMENT OF SHAREHOLDER PROFITABILITY

Incentives for PG&E shareholders were originally established as a result of the Collaborative agreement in 1990. These incentives applied to 1992 programs. However, incentive regulation for PG&E is currently in transition as the 1992 incentive mechanism has been replaced by an interim mechanism for 1993. In turn, a new mechanism is scheduled to be adopted under the CPUC's DSM OII/OIR currently underway.

THE 1992 INCENTIVE MECHANISM

For Resource programs, PG&E's incentive was calculated by multiplying the net present value of lifecycle benefits of each program's actual accomplishments (using the utility cost test) by 0.15. In other words, the shareholders were entitled to 15% of the program's net present benefit. However, each program had to meet minimum performance standards (MPS) to be eligible for an incentive payment. Theoretically, programs that failed to meet MPS would be assessed a penalty equal to 0.15 times the difference between the MPS and the actual performance. However, all PG&E programs met their targets in 1992.

Equity and Service programs are treated on a cost-plus basis, with the utility able to earn 5% of the actual program expenditures up to pre-authorized budget levels. Again, programs must meet minimum performance standards but there is no penalty for failing to do so.

PG&E's Resource programs generated annual energy savings of 110 MW, 515 GWh, and 22 million therms in 1992. The utility earned incentives of $57.1 million for these programs as total earnings were capped. Without the cap the utility would have been eligible for $65.2 million. A further $1.9 million in incentives were earned through Equity and Service programs.

THE 1993 INTERIM MECHANISM

Resource programs in 1993 will be treated under a modified flat shared-savings mechanism. Incentives and penalties will be calculated by taking the difference between minimum performance standards and actual performance, with penalties or rewards increasing as the gap between projection and achievement increases.

Other non-resource programs will be treated under a performance adder incentive. This incentive is virtually identical to the 1992 mechanism except for new construction programs where the incentive ranges from 8% to 20% based on achievement relative to MPS.

Incentives can be claimed the year following program implementation and collected over a three-year period.

TREATMENT OF THE DIRECT ASSISTANCE PROGRAMS

The Direct Assistance programs met their MPS for 1992 by reaching 54,876 units, well above the minimum level of 47,600. The program was thus eligible for shareholder incentives of $1,294,000.

Under the 1993 interim procedures, PG&E is able to earn up to 5% of its authorized budget expenditures on the Direct Assistance programs if minimum performance standards are reached. Unlike Resource programs, incentive regulation for this program remains unchanged from 1992. ■

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Special thanks to Jeff Crowe for his guidance and support throughout the development of this profile and for his hospitality in San Francisco in November 1993.